

# Self-reported medicinal cannabis use in Flanders

A study of user profiles and patterns of use

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## English summary

While the scientific knowledge about the medicinal effects of cannabis continues to increase, information about the patterns of medicinal cannabis use and about the profiles of self-identified medicinal cannabis users remains scarce. Once limited to particular conditions, medicinal cannabis use is now becoming more widespread. Since there are limited regulations concerning medicinal cannabis use in Belgium, we know hardly anything about whether and how people use cannabis for medical purposes. The majority of those who currently use cannabis medicinally do so illegally and without assurances of quality control. They often have no other choice but to obtain cannabis from illicit sources and experiment with self-medication, without proper guidance of a medical professional.

Against this background, the main goal of the doctoral study is to improve our understanding of using cannabis for self-defined medical purposes by presenting a nuanced and comprehensive picture of the phenomenon, with a specific focus on the blurred boundaries between medicinal and recreational cannabis use. Using an interdisciplinary approach at the interface of criminology and medicine, the goal of this dissertation is not to (dis)prove the efficacy of medicinal cannabis use; rather it aims to explore and understand the profiles, patterns of cannabis use and experiences of those ‘labelling’ themselves as medicinal cannabis users. The main empirical issues of this study are aimed at gaining insight into: (1) ‘the meaning of medicinal cannabis use and its conceptual boundaries with recreational cannabis use’, (2) ‘the profiles, opinions and experiences of self-defined medicinal cannabis users’ and (3) ‘internal and external stigma among self-identified medicinal cannabis users’. The study has a mixed methods design, drawing on two data collection methods: an online questionnaire (n=381) and in-depth interviews (n=62) conducted with adult self-identified medicinal cannabis users living in Flanders (Belgium).

The study findings show that self-proclaimed medical cannabis users are a highly heterogeneous population whose main aim is to achieve symptom relief through the use of cannabis. Medicinal cannabis use patterns appear to be diverse and complex. The findings on self-labelled medicinal cannabis users’ experiences with and attitudes towards recreational and medicinal cannabis use contribute to the currently limited literature available on the overlap between the two types of use. The study unveiled that motives for recreational and medicinal cannabis use are intertwined and not mutually exclusive, but context-sensitive. Nonetheless, the findings suggest that medicinal users who have experience with using cannabis recreationally differ in many respects from people who have no such experience.

In Belgium, medicinal cannabis use is currently legally and medically not accepted. Self-identified medicinal cannabis users’ narratives reveal the stigma associated with medicinal cannabis use. Internalised stigma among self-described medicinal cannabis users was identified through participants’ behavioural and cognitive strategies to cope with it. In this context, self-labelled medicinal cannabis users feel a strong need to define, to conceptualise and to make symbolic distinctions between medicinal and recreational cannabis use.

This thesis enriches the existing literature on medicinal cannabis use by examining self-defined medicinal cannabis use. The present findings may contribute to a better understanding of cannabis use altogether. Since medicinal cannabis use is a complex phenomenon, it requires complex and adaptive policy interventions. The findings of this study provide valuable insights for future policy-making in (medicinal) cannabis regulations.



## Nederlandstalige samenvatting

Terwijl de wetenschappelijke kennis omtrent de medicinale effecten van cannabis toeneemt, blijft de informatie over medicinaal cannabisgebruikspatronen en over de profielen van zelfverkleerde medicinale cannabisgebruikers schaars. Medicinaal cannabisgebruik was vroeger beperkt tot bepaalde aandoeningen, maar kent de laatste jaren een sterke opmars en geraakt hierdoor meer wijdverspreid. In België is enkel het gebruik van medicatie op basis van cannabis voor medische doeleinden onder zeer strikte voorwaarden toegelaten. Dit heeft als resultaat dat we nauwelijks over informatie beschikken over of en hoe mensen in België cannabis voor medicinale redenen gebruiken. Diegenen die aangeven dat ze cannabis medicinaal gebruiken doen dit momenteel meestal op een illegale wijze en zonder garanties op kwaliteitscontrole. Ze hebben vaak geen andere keuze dan het raadplegen van illegale kanalen om cannabis te verkrijgen en te experimenteren met zelfmedicatie, zonder de juiste begeleiding van een arts.

Tegen deze achtergrond is het belangrijkste doel van dit doctoraatsonderzoek om onze kennis van het gebruik van cannabis voor zelf-gedefinieerde medische doeleinden te vergroten door een genuanceerd en volledig beeld van het fenomeen te geven, met een specifieke focus op de vage grenzen tussen medicinaal en recreatief cannabisgebruik. Met behulp van een interdisciplinaire benadering op het raakvlak van criminologie en geneeskunde, heeft dit onderzoek niet tot doel om de effectiviteit van medicinaal cannabisgebruik te bewijzen of te weerleggen; maar beoogt het om de profielen, gebruikspatronen en ervaringen van diegenen die zichzelf 'labelen' als medicinale cannabisgebruiker te onderzoeken en te begrijpen. De belangrijkste empirische kwesties van deze studie zijn gericht op het verkrijgen van inzicht in: (1) 'de betekenis van medicinaal cannabisgebruik en de conceptuele grenzen met recreatief cannabisgebruik', (2) 'de profielen, meningen en ervaringen van zelf-gedefinieerde medicinale cannabisgebruikers', en (3) 'intern en extern stigma bij zelf geïdentificeerde medicinale cannabisgebruikers' (3). Het onderzoek heeft een *mixed method* onderzoeksdesign, waarin twee methoden van gegevensverzameling worden aangewend: een online vragenlijst (n=381) en diepte-interviews (n=62) werden afgenomen onder volwassen zelf-geïdentificeerde medicinale cannabisgebruikers die in Vlaanderen (België) wonen.

Uit de onderzoeksresultaten blijkt dat zelfbenoemde medicinale cannabisgebruikers een zeer heterogene populatie zijn die met het gebruik van cannabis symptoomverlichting als belangrijkste doel hebben. De empirische bevindingen tonen tevens aan dat medicinale cannabisgebruikspatronen divers en complex zijn. De bevindingen over de ervaringen en attitudes van zelfverkleerde medicinale cannabisgebruikers ten aanzien van medicinaal en recreatief cannabisgebruik dragen bij aan de huidig beperkte literatuur over de overlapping tussen de twee types van gebruik. Deze studie laat zien dat motieven voor recreatief en medicinaal cannabisgebruik elkaar niet wederzijds uitsluiten, maar verweven en contextafhankelijk zijn. Medicinale gebruikers die ervaring hebben met het recreatief gebruiken van cannabis blijken in verscheidene opzichten te verschillen van mensen die dergelijke ervaring niet hebben.

Medicinaal cannabisgebruik is zowel op juridisch als op medisch vlak momenteel niet geaccepteerd in België. Uit de interviews met zelf-geïdentificeerde medicinale cannabisgebruikers komt het stigma dat geassocieerd is met medicinaal cannabisgebruik duidelijk naar voor. Geïnternaliseerd stigma onder zelfbenoemde medicinale cannabisgebruikers werd geïdentificeerd door het blootleggen van de gedragsmatige en cognitieve strategieën van de deelnemers om hiermee om te gaan. In deze context hebben zelfverklaarde medicinale cannabisgebruikers een sterke behoefte om medicinaal en recreatief cannabisgebruik te definiëren, te conceptualiseren en een onderscheid te maken tussen de twee types van gebruik.

Dit proefschrift verrijkt de bestaande literatuur over medicinaal cannabisgebruik door zelf-gedefinieerd medicinaal cannabisgebruik te onderzoeken. De huidige bevindingen kunnen bijdragen tot een beter begrip van cannabisgebruik in het algemeen. Aangezien medicinaal cannabisgebruik een complex fenomeen is, vereist het complexe en aangepaste beleidsinterventies. De bevindingen van het onderzoek bieden waardevolle inzichten voor toekomstige beleidsvorming in (medicinale) cannabisreguleringen.

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## List of abbreviations

ADHD	Attention deficit hyperactivity disorder
AIDS	Acquired immune deficiency syndrome
ALS	Amyotrophic lateral sclerosis
CBD	Cannabidiol
CBN	Cannabinol
CFS	Chronic fatigue syndrome
CINV	Chemotherapy induced nausea and vomiting
COPD	Chronic obstructive pulmonary disease
EMA	European Medicines Agency
EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
FAMHP	Federal Agency for Medicines and Health Products
GMP	Good Manufacturing Practices
GP	General practitioner
HIV	Human immunodeficiency virus
IACM	International Association for Cannabinoid Medicines
IBS	Irritable bowel syndrome
ME	Myalgic encephalomyelitis
MS	Multiple sclerosis
OCD	Obsessive compulsive disorder
OR	Odds ratio
PMS	Premenstrual syndrome
PTSD	Posttraumatic stress disorder
RCT	Randomised controlled trial
RWD	Real world data
RWE	Real world evidence
SF-36	36-Item Short Form Health Survey
THC	$\Delta^9$ -tetrahydrocannabinol

# Introduction

## A brief history of medicinal cannabis use

Recreational and medicinal cannabis use both have a long history. According to historical evidence, the first use of cannabis preparations can be found in China and dates back to over four thousand years ago. Several writings and pharmacopeia from the past indicate that cannabis was presumably consumed in every time period in history across many cultures, predominantly in Eastern countries. In Europe the use of cannabis dates back to before the Christian Era, however cannabis was exclusively used for its fibres. Only in the nineteenth century was cannabis first used for its medicinal properties in Europe (Zuardi, 2006; Taylor, 2008).

Cannabis has been used regularly as a folk remedy in Western countries since the mid-nineteenth century but decreased in the early twentieth century when policymakers started campaigns terrifying the public about the dangers of cannabis (Zuardi, 2006). Cannabis was portrayed as an extremely hazardous substance used by the most underprivileged populations and as a threat to the entire society (Nolf, 2004). Especially in the United States, cannabis was deemed the cause of crime and deviant behaviour, which was also considered to be a menace from the lowest minority classes (Nolf, 2004; Lurigio, 2014).

Recreational cannabis use and the psychotropic properties of cannabis were overemphasised, and as a result the substance together with its medicinal properties fell into obscurity (Nolf, 2004; Taylor, 2008). From the mid-twentieth century cannabis disappeared largely as a medicine in Western societies as a result of banning cannabis from pharmacopoeias by policymakers. International health organisations and several governments listed cannabis as an illicit drug and no longer as a therapeutic agent. Many countries recognised the UN Single Convention on Narcotic Substances in 1961 and the UN Convention of Psychotropic Substances in 1971 which classified cannabis as a substance with no, or very limited, medical value (Taylor, 2010). Up until today, these regulatory barriers still impede the medical research into the use of cannabis for medicinal purposes.

Another reason why cannabis was losing its popularity as a medicine at that time, was due to the rise of newly developed synthetic analgesics, such as opiates, aspirin and phenobarbital. Those medicines appeared to be more efficacious, since they targeted particular symptoms and patients could consume measured doses. In addition, it was possible to administer the medicines by newly developed methods of delivery, such as pills and the hypodermic syringe, which was impossible for cannabis at that time since its pure active ingredients were not yet isolated (Zuardi, 2006). Furthermore, cannabis had an irregular supply whereas the pharmaceutical products had a consistent availability (Taylor, 2010).

In the 1960s and 1970s when cannabis became very popular as a recreational drug, a revival of interest emerged in its therapeutic properties at the same time (Zuardi, 2006). Patients living with severe diseases such as MS, cancer, HIV, glaucoma etc., discovered that cannabis had therapeutic benefits for their symptoms (Ogborne et al., 2000). The rediscovery of these therapeutic effects renewed the interest of

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scientific researchers in studying the pharmacokinetics of cannabis. It is only recently that the scientific knowledge on the chemical composition and pharmacological effects of cannabis has been established. It was only in 1964 that Raphael Mechoulam and his colleagues elucidated the structure of  $\Delta^9$ -tetrahydrocannabinol (THC), and in 1967 THC was synthesised for the first time (Taylor, 2010). It was not until 1988 that researchers unravelled the endogenous cannabinoid system in the human body (Taylor, 2008). These developments led to the growing interest in the use of cannabis as a treatment.

## Current state of affairs

In the past few decades cannabis has been continuously in the lead of the most frequently used illicit psychoactive substance worldwide, with an annual prevalence of 192 million people using at least once per year (United Nations, 2018). Nowadays, we are dealing with a rapidly changing regulatory environment internationally regarding cannabis use. We observe an emerging therapeutic role of cannabis in addition to its widespread recreational use, increasing public and scientific interest in the medical applications of cannabinoids, rising public and medical support for medicinal cannabis use, increasing pressure from patients to get legal access to safe cannabis products, and policy shifts towards decriminalisation and/or legalisation of medicinal and recreational cannabis use. These developments are backed up with mounting scientific evidence showing promising results for the therapeutic potential of cannabinoid drugs in multiple conditions (Whiting et al., 2015; Allan et al., 2018). Several pharmaceutical cannabis-based and synthetic cannabinoid medicines are currently undergoing clinical trials.

## Current Belgian context

The latest European drug report, published by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA, 2019), shows that 15% of the Belgian adults have used cannabis at least once in their lifetime. This is lower than the European average of 27.4%.

Cannabis has an ambiguous legal status in Belgium. The access to cannabis products used for medicinal purposes is currently very limited. Herbal cannabis, in the form of dried flowers and leaves, cannabis extracts and synthetic cannabinoids are illegal. The cultivation, possession and sale of herbal cannabis with THC percentages above 0.2% is illegal and subject to criminal law (FAVV, 2019). A joint guideline issued by the Minister of Justice and the College of Public Prosecutors in 2005 sets out that when adults possess an amount of cannabis suitable for personal use, there are no aggravating circumstances and it does not cause disturbance of the public order, the prosecution has lowest priority. Personal use means quantities not exceeding three grams or a maximum of one cultivated plant. In Dutch, this policy is called “*gedoogbeleid*”, which means that there is tolerance for certain offences and therefore these laws

are not enforced. Still, due to the illegal status of cannabis in Belgium, individuals who use cannabis for medicinal purposes have to turn to illicitly sourced cannabis, with the absence of any quality control.

There is one option for Belgian patients to obtain medical grade herbal cannabis and cannabis oil, however this also involves breaking the law. Since Belgian physicians have therapeutic freedom, they are not in violation when they prescribe cannabis for their patients. Any physician in Belgium is allowed to prescribe it for whichever indication (FAGG, 2017). These prescriptions are valid in Dutch pharmacies that provide pharmaceutical grade herbal cannabis produced by the company Bedrocan®. However, importing cannabis from the Netherlands into Belgium is illegal, this means that there remains a chance of prosecution. Accessing cannabis this way is probably still a better option than to venture into illegal circuits, because patients are guaranteed quality cannabis with consistent strength and composition (Hazekamp, 2006), and their physicians are informed about their use.

Pharmaceutical medicines based on cannabis were until recently not available in Belgium. In June 2015, a federal governmental decree came into force that regulates products that contain tetrahydrocannabinol. The decree formally prohibits the delivery of herbal cannabis for medicinal purposes, but it permits the sale and use of licensed medicines based on active ingredients of cannabis under strict conditions (FAGG, 2019). Until now, the only cannabinoid based medicine that has obtained a license is Sativex®.<sup>1</sup> This medicine is supposed to be used for the treatment for spasticity caused by multiple sclerosis (MS) and solely by patients for whom other treatments have proven to be ineffective. The medicine is only obtainable in hospital pharmacies and has to be prescribed by a neurologist. Other physicians are allowed to prescribe Sativex® off-label for patients who do not suffer from MS (e.g. chronic pain), however they will not receive any reimbursement (FAGG, 2017). Given the fact that Sativex® is extremely costly without reimbursement, it is unrealistic for other patients to use it on a regular basis.

The non-psychoactive cannabinoid cannabidiol (CBD) is in a legal grey area. To date, no medicine has been licensed containing solely CBD (e.g. Epidiolex®) (FAGG, 2019). The sale of food supplements based on CBD is currently also prohibited (FAVV, 2019). In recent years, ‘CBD shops’ selling CBD products have been popping up quickly everywhere in Belgium. However, many of these stores are regularly visited by officials and are closed down due to different violations (e.g. unfounded health claims).

The public debate on the legalisation of cannabis for medicinal use is currently very topical, and there is increasing public pressure on Belgian policy makers to take steps forward. For instance, patient testimonials about the use of cannabis for medicinal purposes turn up frequently in the media. Very recently, Belgian patients have hired an attorney to institute proceedings against the government because cannabis cannot be obtained legally on prescription. Furthermore, a small country such as Belgium, located in the centre of Western Europe, is not immune to international developments, including the liberalisation of access to cannabis products in certain nations. Whereas our neighbouring country the Netherlands has had a medicinal cannabis program operational for over 15 years, other European

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<sup>1</sup> See Part I Literature review section 1.5.1 Pharmaceutical cannabinoid products

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countries are starting to implement medicinal cannabis policies, making herbal cannabis available for the treatment of certain medical conditions (e.g. Germany, Italy, Poland, etc.) (EMCDDA, 2018b; Abuhasira et al., 2018).

Very recently in 2019, the Belgian government approved the establishment of a ‘cannabis office’ (similar to the Dutch Office of Medicinal Cannabis (OMC))<sup>2</sup>. This office will operate under the Belgian Federal Agency for Medicines and Health Products (FAMHP). It will be responsible for and will monitor the production, distribution, importation and exportation of cannabis used for scientific and medical purposes. Licences will be granted to private companies to produce cannabis, which will be purchased and distributed by the office. The cultivation process will have to meet stringent standards. The creation of the cannabis office does not allow patients to buy medical grade herbal cannabis in Belgium, for this further regulatory changes are required (FAGG, 2019).

## Research goal and research questions

Until today, most studies on medicinal cannabis use, relying on self-report measures among medicinal cannabis users, were performed in the United States (e.g. Troutt & Didonato, 2015; Aggarwal et al. 2009; Ilgen et al. 2013) and in Canada (e.g. Lucas, 2012; Belle-Isle et al., 2014; Ware et al. 2003). A few studies have been conducted in European countries, including Germany (Grotenhermen & Schnelle, 2003), the United Kingdom (Ware et al., 2005), Norway (Pedersen & Sandberg, 2013) and Denmark (Dahl & Frank, 2011). Previous studies illustrate that in countries where medical cannabis regulations are absent (e.g. United Kingdom) people still report using cannabis for medicinal purposes (Ware et al., 2005).

The knowledge on medicinal cannabis use in Belgium remains scarce because of its illegal status. Results from previous research on medicinal cannabis use cannot be simply transferred to Belgian self-identified medicinal cannabis users, because of different legislative, sociohistorical and cultural contexts. The present study (funded by the Research Foundation Flanders–FWO)<sup>3</sup> aims to improve the understanding of self-defined medicinal cannabis use, by presenting a nuanced and comprehensive picture of the phenomenon, with a specific focus on the blurred boundaries between medicinal and recreational cannabis use. To my best knowledge this is the first study conducted in Belgium examining medicinal cannabis use patterns and characterizing self-identified medicinal cannabis users.

I aim to contribute to existing theories on cannabis use in general, and medicinal cannabis use in particular, and to explore the meanings of concepts such as ‘self-medication’, ‘recreational’ and ‘medicinal’ use. Using an interdisciplinary approach, the study aims to combine medical and criminological insights to explore the conceptual confusion related to the use of medicines

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<sup>2</sup> See Office of Medicinal Cannabis: <https://english.cannabisbureau.nl/>

<sup>3</sup> The FWO funds fundamental and strategic scientific research in Flanders. This research project was supported by grant number G.0154.15N



(pharmaceutical drugs) and drugs (illegal psychoactive substances). From a medical perspective, I am interested in the wide range of medical conditions and symptoms that are instigating medicinal cannabis use, the different user profiles that are involved and their experiences with cannabis as a medicine. From a criminological perspective, I focus on the implications of the illegal status of medicinal cannabis use and the use of the concept as a justification or technique of neutralisation.

Most available research limits the focus on symptom relief by chronically ill patients who use cannabis for medical purposes. However, medicinal use may also apply for cannabis users who are not diagnosed with a chronic condition, yet they report their use as a form of self-medication (Pedersen, 2015). As there are limited regulations concerning medicinal cannabis use in Belgium, we know hardly anything about whether and how people use cannabis for medical purposes. Those who currently use cannabis medicinally do so illegally and without assurances of quality control. They have to obtain cannabis from illicit sources and experiment with self-medication, without the supervision of a medical professional. Even in countries where official governmental programmes are installed, such as in the Netherlands and Canada, some practitioners seem to be hesitant to prescribe cannabis and people keep purchasing it on illicit markets (Hazekamp & Heerdink, 2013; Lucas, 2012; Bobitt et al., 2019). As self-medication is the most common way of using cannabis medicinally, there may be a lot to learn from the experiences of self-defined medicinal cannabis users.

Using an interdisciplinary approach on the interface of criminology and medicine, I do not seek to (dis)prove the efficacy of therapeutic cannabis use; rather I want to explore and understand the profiles, characteristics and experiences of those ‘labelling’ themselves as medicinal cannabis users. There are remarkably few studies available regarding this group (e.g. Swift et al., 2005; Pedersen, 2015; Lucas, 2012; Walsh et al., 2013). The majority of studies into medicinal cannabis use recruit their participants from clinical settings (e.g. pain clinics), medical marijuana dispensaries or official medicinal cannabis programs (e.g. Aggarwal et al., 2013; O’Connell & Bou-Matar, 2007; Grella et al. 2014; Waissengrin et al., 2015; Lucas & Walsh, 2017). However, studies show that people who report that they use cannabis for medicinal purposes are not necessarily ‘severely’ ill (O’Brien, 2013) and that they do not always obtain their cannabis from legal or pseudo-legal sources (Hazekamp et al., 2013). Fewer studies recruit their respondents from the general population (e.g. Swift, 2005; Pedersen & Sandberg, 2013). In these studies, the respondents claim that they use cannabis for medicinal reasons, without the obligation to suffer from a diagnosed severe or chronic disease. Their cannabis use also does not have to be authorised by their physicians. In the current study, respondents are recruited from the general population, since I want to capture the broad variety of medicinal purposes for which cannabis is used.

In the Belgian context where cannabis is illegal, it is impossible to obtain a statistically representative sample of medicinal cannabis users (i.e. a ‘hidden population’). It is not my goal to estimate the number of people using cannabis for medicinal purposes. The perspective of the self-described medicinal cannabis user will be the centre of the study, in which I explore their experiences and use patterns. It may allow us to better understand the thin line between medicinal and recreational use of cannabis. For instance, as stated by Swift and colleagues (2005), an individual may initially use cannabis recreationally

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but then discover (sub)consciously an improvement of an (un)diagnosed condition. Taking this perspective, I study whether or not ‘feeling high’ is understood as a crucial component of what makes cannabis a therapeutic substance, and whether or not self-identification as a medicinal user may serve to neutralise negative social reactions from non-users, and serve as a justification for recreational use.

The vast majority of the studies into medicinal cannabis use adopt quantitative research designs (e.g. Hazekamp et al., 2013; Cranford et al., 2016; Lankenau et al., 2018). As a consequence, very little in-depth research is performed in countries where herbal cannabis is illegal and where no ‘pseudo-legal’ institutions, such as cannabis dispensaries, are present. Most Belgian medicinal cannabis users do not have the opportunity to obtain cannabis from any legal (e.g. pharmacies) or ‘pseudo-legal’ (e.g. dispensaries) institutions providing medical grade cannabis. Very few studies have been conducted in countries where people have almost no legitimacy to use cannabis for medical reasons and in which self-labelled medicinal cannabis users are the research population. There is a clear need for ‘user-based’ studies in order to identify the patterns of medicinal cannabis use and the characteristics and experiences of those involved.

To improve our understanding of medicinal cannabis use and the experiences and profiles of self-described medicinal cannabis users, this thesis has three objectives and four research questions.

### Research objectives:

**Aim 1: explore the meaning of medicinal cannabis use and its conceptual boundaries with recreational cannabis use**

**Aim 2: describe the profiles, opinions and experiences of self-defined medicinal cannabis users**

**Aim 3: identify internal and external stigma among self-identified medicinal cannabis users**

### Research questions:

Research question 1: *What are the different profiles and characteristics of self-identified medicinal cannabis users in Flanders?*

This research question implies an analysis of the variation in sociodemographic characteristics, illicit and licit drug use, level of education, employment, medical conditions or diagnosis, medical history, symptoms, contact with medical facilities and knowledge of therapeutic efficacy of cannabis.

Research question 2: *‘What are their attitudes towards and experiences with the (former) use of cannabis for medicinal purposes?’*

This research question includes an analysis of self-identified medicinal cannabis users’ experiences with cannabis’ effects, patterns of medicinal cannabis use (variety, amount, means of administration, (social) setting), quality of cannabis, onset and motives for cannabis use, reasons for trying/stopping/fluctuation, cannabis-related problems, effectiveness and side effects, comparisons with conventional medications, opinion of family members and medical personnel, and the impact of cannabis use on daily life. It also covers their attitudes towards the use of (non-)conventional medicines and treatments, towards the ‘high’ and other psychoactive effects when using cannabis medicinally, and towards medicinal cannabis use in general.

Research question 3: *‘What are their attitudes towards and experiences with the (former) use of cannabis for recreational purposes?’*

This research question covers onset of and motives for recreational use, overlap between recreational and medicinal use, meaning of recreational cannabis use and patterns of recreational use (variety, amount, means of administration, (social) setting). It also includes their attitudes towards the ‘high’ and other psychoactive effects when using cannabis recreationally, and towards recreational cannabis use in general.

Research question 4: *‘What experiences do self-described medicinal cannabis users in Flanders have with stigma and do they use strategies to cope with stigma?’*

To answer this research question, the following research topics have been developed to address the different aspects of stigma: internal and external stigma; culturally-induced expectations of rejection; consequences of stigma; and cognitive and behavioural coping strategies for stigma, including techniques of neutralisation, techniques of risk-denial and normalisation.

## Structure of the doctoral thesis

This doctoral thesis is structured into five large sections, each of them comprising multiple chapters.

In **Part I** the comprehensive results of an extensive literature review are presented. This literature review provides an overview of existing studies into medicinal cannabis use, in order to situate the present study within the existing body of theoretical knowledge. It focusses on the therapeutic potential of cannabis, the profiles of medicinal cannabis users and the position of cannabis in modern medicine.

In **Part II** I present the conceptual and theoretical framework on which this study was based. **Part III** details the epistemological considerations and research methods. This includes the data collection methods, the data analysis methods, the quality of the research design, the study population, the

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limitations of the research, and finally the ethical considerations. This study is built on a mixed methods approach, drawing on quantitative and qualitative data collection methods.

**Part IV** presents the empirical results. This part is structured into six thematic chapters, each of them presenting the qualitative and quantitative results in separate sections. In the chapters' discussion sections, the qualitative and quantitative findings are interpreted and discussed together and linked to the existing literature.

**Part V**, the final section of this thesis, presents the general conclusions of the current study. Firstly, I discuss the key findings. Secondly, I outline the most important limitations of the study and make recommendations about how to tackle these in future research on medicinal cannabis use. Thirdly, I reflect on suggestions for practice and policy with regards to regulating medicinal cannabis. The doctoral thesis ends with some final remarks, which include the most important take away messages.

# Part I

## Literature review

### Introduction

The literature review aims to provide an extensive overview of existing insights on medicinal cannabis use. It is based on international studies, including quantitative, qualitative and clinical studies.

The first chapter of the literature review serves as an introduction and outlines the therapeutic potential of cannabis. It starts by discussing the chemical properties of cannabis and their interactions with the human body. The chapter then moves on to discuss the therapeutic and adverse effects of cannabinoid products found in previous research. The subsequent section focusses on the different types of cannabis products and administration methods used for medicinal purposes. This first chapter finishes by addressing the literature on the potency and quality of cannabis products currently available to medicinal cannabis users. The second chapter of the literature review covers medicinal cannabis users' profiles, medical conditions, cannabis use patterns and motives for use. In the third and final chapter I focus in on the position of cannabis in relation to modern medicine. The (perceived) differences between standard treatments and cannabis will be identified. This chapter also gives us a better understanding of the current roles and attitudes of medical practitioners with regards to medicinal cannabis use.

It is important to note that currently (medicinal) cannabis regulations are changing rapidly worldwide, and that the medicinal cannabis landscape has transformed tremendously compared to twenty, ten and even five years ago. In addition, the scientific output on medicinal cannabis use has increased exponentially in the past few years. The coming years will be no different, and thus the field of medicinal cannabis use remains highly dynamic. This implies that the studies, on which this literature review is built, were conducted in different contexts. Therefore, some study findings might be outdated and have to be interpreted according to the timeframe in which the study was conducted.

## 1. The therapeutic potential of cannabis

### *Introduction*

In the introduction to this thesis we saw that cannabis has been used for its therapeutic properties all around the world for millennia. Also nowadays, people find their way to the cannabis plant to improve their health and quality of life. This chapter starts with a short introduction to the substance and its chemical compounds. It shows why cannabis can be used as a medical treatment, by explaining how the substance acts upon the human body and brain, and by describing its therapeutic properties. The following sections detail the therapeutic benefits and health risks of cannabis found in previous clinical and observational research. Next, the different types of cannabis products and administration methods currently available to medicinal cannabis users will be discussed. Special attention will be paid to pharmaceutical cannabinoid medicines and their differences from herbal cannabis. Looking into these differences demonstrates some of the advantages and disadvantages of both types of cannabinoid products. Since the potency and quality of cannabis products are in particular important for people using cannabis for health purposes, these two issues will be discussed in detail in the two final sections.

### *1.1 Cannabis compounds*

Cannabis is a polypharmaceutical herb, this means that the therapeutic effects of cannabis are generated by its many interacting compounds (McPartland, 2000). Cannabis consists, besides the strong active cannabinoid<sup>4</sup> delta-9-tetrahydrocannabinol acid ( $\Delta$ 9-THCA), of more than one hundred other phytocannabinoids (e.g. CBDA and CBGA)<sup>5</sup> and non-cannabinoids (e.g. terpenes), which generate effects that are potentially therapeutically beneficial (Russo, 2011).

**Phytocannabinoids** and other components of cannabis are responsible for the overall pharmacological effects that cannabis generates. The pharmacology of these compounds differs. First, **delta-9-tetrahydrocannabinol** ( $\Delta$ 9-THC (decarboxylation of THCA)), the most researched and well-known phytocannabinoid, is mainly responsible for the altered consciousness experienced when consuming cannabis. Additionally, THC is thought to have multiple pharmacological properties, including analgesic, antiemetic, appetite-enhancing, muscle-relaxant, neuro-antioxidative, anti-spasmodic and anti-inflammatory properties (Costa, 2007; Andre et al., 2016).

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<sup>4</sup> Cannabinoids are ligands that bind to cannabinoid receptors, and these can be divided into phytocannabinoids (found in the cannabis plant), synthetic cannabinoids (manufactured artificially) and endocannabinoids (produced in the human body).

<sup>5</sup> The naturally occurring cannabis plant contains phytocannabinoid acids, these are considered inactive. Through heating (decarboxylation) the phytocannabinoid acids THCA and CBDA convert into THC and CBD, their 'active' forms (Maroon & Bost, 2018). Throughout the remainder of this thesis I will use the terms of the phytocannabinoids in their decarboxylated non-acid forms, i.e. THC and CBD.

**Cannabidiol** (CBD (decarboxylation of CBDA)), another phytocannabinoid, was until recently less known than THC, since it does not cause the psychoactive effects sought by recreational users. Recently, the interest in CBD in medical research has risen significantly. Rapidly, the cannabinoid is becoming more popular in the (medical) cannabis industry and among the general population due to its purported therapeutic benefits. The fact that CBD produces pharmacological effects distinct from those of THC and does not produce ‘undesirable’ psychoactive effects is probably the reason for the increase of interest in this cannabinoid (Brunt et al., 2014). CBD has promising pharmacological properties (e.g. antipsychotic and anxiolytic) as it is able to attenuate and counteract the ‘adverse’ psychoactive effects of THC. Furthermore, CBD might have, among others, anti-epileptic, bone-stimulant, anti-bacterial, anti-anxiety, anti-nausea, anti-arthritic, anti-psychotic, anti-inflammatory, immune-modulatory and neuroprotective properties (Izzo et al., 2009, Andre et al., 2016; Hazekamp, 2018). There is a growing body of evidence which shows that CBD is a promising therapeutic agent, however scientific research is in its very early stages.

In addition to these two well-known cannabinoids, other cannabinoids found in cannabis include, among others, cannabichromene (CBC), cannabigerol (CBG), cannabidivarin (CBDV), cannabinol (CBN), etc. Similar to other plants, cannabis also contains **terpenes** (e.g. limonene, pinene, etc.), which are responsible for the aroma and flavour of the plant. Terpenes are known to have pharmacological properties and recent studies have shown that the terpenes may also have an important role in the therapeutic potential of cannabis (Andre et al., 2016; Russo, 2011). These phytochemicals are all active ingredients of cannabis, but until today they have been far less frequently the subject of clinical trials.

The various phytochemicals which cannabis contains interact and influence each other’s mechanisms. Previous research suggests that interactions take place between cannabinoids, terpenes and other compounds found in cannabis (Russo, 2011). As a result they produce synergetic effects<sup>6</sup> (also known as the entourage effect) and antagonistic effects<sup>7</sup> (Karimi et al. 2015). A particular compound can decrease or increase the effect generated by another compound. For instance, THC produces psychoactive effects which are mitigated by CBD (Brunt et al., 2014). This example demonstrates an important advantage of polypharmaceutical herbs, which is the fact that side effects produced by a single compound can be antagonised by others (McPartland, 2000).

## *1.2 The human endocannabinoid system*

In order to understand the medical potential of cannabis it is important to look into the processes generated by cannabinoids in the human body. Cannabis’ effects are established by its influence on the **endogenous cannabinoid system**. This endocannabinoid system is a physiological system involved in several fundamental functions of the human brain and body. However, its functioning and interactions

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<sup>6</sup> Synergetic effect: an effect arising between two or more compounds that causes an effect greater than the sum of the individual effects of each compound.

<sup>7</sup> Antagonistic effect: the effect produced by the contrasting actions of two or more compounds

with cannabinoids have not yet been entirely unravelled. The functions which scientists assume the system participates in are, amongst others: the central nervous system, analgesia, cognition, memory, mood, locomotor activity, appetite, vomiting, immune control, endocrine functions, body temperature, heart rate, intraocular pressure, etc. (Rosenthal et al., 1997; Cook et al., 2015).

The endocannabinoid system consists of endocannabinoid receptors and their endogenous ligands, that are widely present within the body. To date, two primary cannabinoid receptors have been identified, which are called CB1 and CB2 receptors. Phytocannabinoids, synthetic and endogenous cannabinoid substances of the human body (**endocannabinoids**) can bind to the endocannabinoid receptors CB1 and CB2. The endocannabinoids or endogenous ligands that bind with these receptors are anandamide and 2-arachidonoyl glycerol (Verbeke et al., 2005; Andre et al., 2016; Lu & Mackie, 2016). The endocannabinoids are thought to be involved in physiological processes including appetite, pain, nausea, mood, memory, inflammation, insulin sensitivity, fat and energy metabolism (Rosenthal et al., 1997; Cook et al., 2015; Andre et al., 2016).

### *1.3 Therapeutic applications*

Cannabis' polypharmaceutical characteristic and the fact that it interacts with the human endocannabinoid system, turns the substance into a therapeutic agent potentially useful for different types of conditions and symptoms. Cannabis' multifaceted effects on the human body and mind turns cannabis into a polyvalent medicine (Grotenhermen & Schnelle, 2003). For instance, cannabis causes euphoria, heightens the consciousness and affects the perception of pain and muscle control. In addition, preliminary evidence suggests that the substance could be sedative, anxiolytic, hypnotic, analgesic, appetite inducing, antiemetic, etc. (Russo, 2011; Rosenthal et al., 1997). However, the advantage of the therapeutic versatility of cannabis can become a downside. Certain effects induced by cannabis can be therapeutically beneficial for particular conditions, whereas individuals dealing with other conditions may view the same effects as undesirable side effects. For instance, the increase of appetite can be an important medical benefit for cancer patients who experience cachexia<sup>8</sup> or CINV, but unpleasant for other medicinal cannabis patients.

The recognition of the medical value of cannabis has increased significantly among patients and medical practitioners in recent years. One reason is probably the non-toxicity of the substance and the few side effects it produces, in the short and long run, in comparison with certain other medicines for which it is substituted. Another reason is the therapeutic versatility of cannabis (Grinspoon, 1999). Surveys with medicinal cannabis users show that cannabis is used by patients for battling the symptoms of various diseases and conditions, such as MS, cancer, fibromyalgia, glaucoma, AIDS, depression, spinal cord injuries, chronic pain, etc.<sup>9</sup> Until today, the clinical research into the medicinal use of cannabis by

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<sup>8</sup> Cachexia is a wasting syndrome characterised by weight loss, muscle atrophy, weakness and loss of appetite. This syndrome is associated with many chronic conditions, such as cancer, HIV, COPD and multiple sclerosis.

<sup>9</sup> See PART I Literature review, section 2.3.3 Medicinal cannabis users' conditions and symptoms



patients dealing with these conditions is still limited and for many conditions there is no sound clinical evidence with regards to safety and efficacy.

Nevertheless, there is conclusive scientific evidence that cannabinoids are therapeutically effective and safe for particular symptoms and conditions. Today, the therapeutic efficacy of cannabinoids in the treatment of multiple sclerosis receives the most support. Clinical trials suggest that pharmaceutical cannabis derivatives (Sativex®) are effective in improving symptoms caused by MS, including muscle spasms and neuropathic pain (Chohan et al., 2016; Patti et al., 2016; Allan et al., 2018).

Several systematic reviews and meta-analyses have been conducted that synthesise all the available evidence on the safety and efficacy of cannabinoid treatments for particular conditions. A meta-analysis from 2014 exploring herbal cannabis therapy for (non-cancer) chronic pain demonstrated a moderate reduction in pain intensity with minimal side effects in chronic patients with the use of herbal cannabis (Seneca, 2014). A systematic review that looked into isolated cannabinoids instead of herbal cannabis showed consistent results with this meta-analysis (Deshpande et al., 2015). A recent systematic review carried out by Tafelski and colleagues (2016) that evaluated six systematic reviews on efficacy, tolerability, and safety of cannabinoids for chemotherapy-induced nausea and vomiting (CINV), showed that there is moderate quality evidence that pharmaceutical cannabinoids would be beneficial for the treatment of CINV. However, the cannabinoids were less safe and less tolerated than conventional antiemetic drugs. Two recently published systematic reviews have looked into the therapeutic potential of cannabis and cannabinoids in the treatment of epilepsy. The two reviews conclude that randomised controlled trials suggest that pharmaceutical-grade CBD may be may effective in reducing seizure frequency in paediatric-onset drug-resistant epilepsy, when used as an adjuvant treatment. However, this finding is based on a few randomised controlled trials (RCTs), and thus more research is required (Stockings et al., 2018; Elliott et al., 2019).

Whiting et al. (2015) performed a systematic review covering randomised clinical trials that investigated the benefits and adverse effects of cannabinoid drugs used for various conditions. The review indicates that there is moderate quality evidence that these medicines improve chronic pain and spasticity. There is low-quality evidence for the improvement of nausea and vomiting due to chemotherapy, weight gain in HIV infection, sleep disorders, and Tourette syndrome. Finally, there is low-quality to no evidence for the effects on psychosis and depression. This systematic review found that there was no difference between herbal cannabis and other cannabinoid drugs. However, only two out of the 79 studies evaluated herbal cannabis. The researchers argue more studies are necessary on the effects of herbal cannabis, since there is currently very little evidence about the benefits and side effects of herbal cannabis (Whiting et al., 2015).

Most knowledge regarding the medicinal use of the cannabis plant still relies mainly on anecdotal evidence and soft science. Although the number of clinical trials and laboratory research studies with cannabinoid medicines is currently expanding exponentially, most of this research is performed with cannabis' isolated chemical substances (e.g. THC (dronabinol)) and pharmaceutical cannabis-based medicines, and not with the plant as a whole.

There is an important limitation regarding the research findings of clinical trials studying the medical applications of cannabis and cannabinoids. This limitation comes from the fact that clinical studies inquire into different types of cannabis products, which vary in chemical content and are ingested with different types of administration methods. For instance, while some clinical trials study pharmaceutical (single compound) products that have to be orally ingested (e.g. Marinol®), other studies analyse the inhalation of herbal cannabis preparations through sophisticated medical inhalation devices. Elliott et al. (2019), who conducted a systematic review on cannabis-based products for paediatric epilepsy, emphasise the fact that “all available evidence from RCTs is related to one pharmaceutical cannabidiol product and should not be extended to all cannabis-based products.” (p.7). These differences in cannabinoid products and consumption methods make comparisons between results impossible and complicate the interpretation of the results regarding the safety and efficacy of medicinal cannabis use overall.

### 1.3.1 Therapeutic potential for mental health problems

Surveys with medicinal cannabis users indicate a high number of individuals using cannabis for mental disorders and psychiatric symptoms (e.g. Swift et al., 2005; Lankenau et al., 2018; Hazekamp et al., 2013). The high number of individuals treating mental health conditions with cannabis is not reflected in the number of clinical trials evaluating the therapeutic efficacy of cannabinoids for mental health problems. However, in recent years, progress has been made in studying the treatment of mental health disorders with cannabinoid treatments more systematically.

The study of Bergamaschi et al. (2011) provided evidence that cannabis can be effective in battling social anxiety. In this study it was clear that individuals dealing with social anxiety benefited from being under the influence of the non-psychoactive cannabinoid CBD, because of its anxiolytic properties. More evidence for the use of cannabis for anxiety disorders comes from the study of Lenza (2007) who discovered that alcoholics used cannabis successfully in the alleviation of symptoms of anxiety and depression. Crippa and colleagues (2010), argue in their review on the use of cannabinoids in psychiatry, that the antipsychotic and anxiolytic properties of CBD have been established in research, and that cannabis could become an important option in the treatment of psychiatric symptoms and disorders. The use of CBD as an (adjunctive) treatment for psychoses, schizophrenia and social anxiety shows positive outcomes (Hoch et al., 2019). While CBD has promising therapeutic benefits for mental health problems, until today THC-based preparations have been tested most frequently as a treatment for mental health disorders (Hoch et al., 2019). A recent systematic review performed by Hoch et al. (2019) suggests that cannabis-based medicines given as adjunctive treatments are associated with improvements of multiple symptoms of mental health disorders, but not with remission. The review concludes by stating that the evidence for the efficacy and safety for cannabis-based medicines as treatment for mental disorders is still small.

### *1.4 Adverse effects*

Cannabis is a relatively safe psychoactive substance. Until today, there has been no known case of a lethal overdose with cannabis. Compared to certain prescription drugs (e.g. opioids) cannabis can be considered superior in the area of safety, since prescription drugs are responsible for a substantial number of deaths every year. For instance, in 2014 in the United States the number of overdose deaths caused by prescription drugs was approximately 25,000. The number of deaths caused by opioid medicines was about 19,000 (NIH, 2015). When discussing the health risks of cannabis, it is important not to forget that prescription drugs also cause adverse effects and have health hazards. Similar to prescription drugs, the benefits for the patient and society generated by cannabis should outweigh its risks. Furthermore, whether a substance is safe for the user not only depends on the substance itself and its pharmacological properties. The frequency of taking the substance, dose, method of ingestion, social setting and mental and physical state of the user are all interacting factors that determine the potential harmfulness of a drug.

Most of the well-known health risks of cannabis are established in research on recreational drug use (Wang et al., 2008). Some of these results are still inconsistent as they are mainly based on anecdotal evidence and soft science, and high-quality clinical trials are lacking. Furthermore the health risks are found in studies that explore non-medical use. Research that looks into the safety of medicinal cannabis use is still at its initial stage. The following paragraphs will discuss the health risks of consuming cannabis, which can be divided into long-term risks and acute adverse effects.

First, the stepping stone theory (or gateway drug theory) is often cited to indicate that cannabis is not a harmless drug in the long run. This theory suggests that the users of ‘soft drugs’ will progress to ‘hard drug use’. However, scientific research is inconsistent on this particular matter and the causal link has never been proven (Cohen, 2010; Bostwick, 2012). There is currently no evidence that cannabis would be a gateway drug when used for medical purposes under the supervision of a physician (Cohen, 2010). There is some preliminary evidence that cannabis could provide a protective effect against initiating illicit and prescription drug use among medicinal cannabis patients, and that the stepping stone theory does not apply to medicinal cannabis users (Lakenau & Iverson, 2015; Janichek & Reiman, 2012).

Second, research indicates that the use of cannabis may be a trigger for the onset of schizophrenia and psychoses, in particular among youth. Studies suggest that these health risks are dose dependent. Frequent use and high levels of THC are associated with an increased risk of psychoses (Marconi et al., 2016; Di Forti et al., 2013). Individuals who start using high potency cannabis early are more vulnerable to develop psychoses and schizophrenia, though most of the time these users already have a genetic predisposition. This is demonstrated by the fact that the number of recreational cannabis users has risen significantly while the percentage of individuals dealing with schizophrenia has been stable. Schizophrenia and cannabis use would be coincidental instead of causal (Volkow et al., 2016).

In addition to psychoses, cannabis use can negatively affect mental health more generally. Dependence is frequently cited as a psychological disorder that one may develop when using cannabis regularly. When consuming high-potency cannabis the risk and severity of dependence increases, in particular among youth (Freeman & Winstock, 2015). Statistics suggest that nine percent of all cannabis users become dependent (Cook et al., 2015). Chronically ill people who use cannabis on a daily basis, for example necessary when they suffer from the AIDS wasting syndrome, may be more vulnerable to dependence (Bonn-Miller et al., 2014). People dealing with psychological disorders who self-medicate with cannabis would also be at greater risk for developing an addiction (Lazareck et al., 2012). Two Australian studies found that among self-identified medicinal cannabis users and among patients using cannabis to manage pain, about one in six met criteria for cannabis dependence (Lintzeris et al., 2018; Degenhardt et al., 2015).

Looking at the attitudes of medicinal cannabis users themselves with regards to dependence, it appears that most are not worried about becoming dependent on cannabis (Ogborne et al., 2000; Swift et al., 2005). The majority of medicinal cannabis users have never sought treatment and do not think therapy is necessary for their cannabis use (Janichek & Reiman, 2012; Grella et al., 2014). Additionally, the overall low dosages of medicinal cannabis users could indicate that there is little problematic use among medicinal cannabis users, but that cannabis has a beneficial influence.

Another established long-term risk is the impact of smoking cannabis on the lungs and the respiratory system (Rosenthal et al., 1997; Jett et al., 2018). Many scientists and medical specialists argue that smoking can never become an approved means of administration for medicinal purposes, since the method of ingestion is per se compromising the individual's health (Bostwick et al., 2013; MacCallum & Russo, 2018). However, the lack of equivalent alternatives gave many patients no other choice than smoking the substance. Furthermore, it is important to note that the therapeutic benefits achieved by smoking cannabis may outweigh its health risks, for example in the case of terminally ill patients.

The number of short-term risks of cannabis is relatively low and they are many times less severe compared to certain other psychoactive drugs. Previously, most adverse effects of cannabis were uncovered in research into recreational use (Wang et al. 2008). The study of Wang et al., in 2008 is one of the few earlier studies that focusses exclusively on the adverse effects of medicinal cannabinoid use. This systematic review shows that most acute adverse effects are not serious and never unexpected. A more recent systematic review of 2019 shows that side effects occurred in clinical trials testing cannabis-based medicines for mental disorders. However, severe side effects were rare (Hoch et al., 2019). Another systematic review conducted in 2018, that identified the adverse effects of medical cannabinoids used for pain, spasticity, and nausea and vomiting, suggests that adverse effects are common (Allan et al., 2018). Research shows that the most reported acute adverse effects caused by cannabis include, among others, cognitive impairment, feeling 'high', euphoria, blurred vision, hallucinations, paranoia, panic reactions, psychosis, sedation, temporary memory deficits, dizziness or light-headedness, dry mouth, fatigue, tachycardia, muscle weakness, impaired motor coordination, myalgia and palpitations (Grant et al., 2012; Andre et al., 2016; Allan et al., 2018). In addition, cannabis

has been associated with cardiac arrhythmias, coronary insufficiency and myocardial infarction (Leung, 2011). However, for most of the effects mentioned above, individuals would develop tolerance when using cannabis regularly (Grotenhermen & Müller-Vahl, 2012).

Surveys examining medicinal cannabis users' self-reports indicate that the majority of medicinal cannabis users do not experience side effects of cannabis or that they are perceived as very mild (Clark et al., 2004; Waissengrin et al., 2015; Ware et al., 2003; Webb & Webb, 2014; Grotenhermen & Schnelle, 2003). Adverse effects reported by medicinal cannabis users in surveys include, amongst others, somnolence, fatigue, dry mouth, sedation, dizziness, feeling 'high', tachycardia, conjunctival irritation, drowsiness, memory loss and hypotension (Fiz et al., 2011; Waissengrin et al., 2015; Ware et al., 2003; Zolotov et al., 2016). In survey research, a significant number of participants have indicated not experiencing adverse effects that are serious (Fiz et al., 2011; Webb & Webb, 2014; Clark et al., 2004). However, one of the reasons for individuals ceasing cannabis use as a treatment, found in previous studies, are the intolerable side effects (Bar-Sela et al., 2013; Ware et al., 2003).

The safety of cannabis should be a high priority for patients. Although the acute side effects of cannabis might seem negligible for people dealing with severe conditions, caution is warranted, because of the high potency cannabis products currently available. The risks of using cannabinoid products that contain extremely high levels of THC are not evaluated in clinical trials. Furthermore, cannabis use can be a greater risk for vulnerable populations such as minors, the elderly, the new-born, the chronically ill and weakened patients. In normal circumstances, cannabis' effects might be considered as relatively harmless, but this may be different for people at risk. For instance, cannabis causes tachycardia which can be problematic for individuals who suffer from coronary insufficiency. In addition, patients with impaired immunity are more at risk for infections when smoking cannabis or consuming contaminated cannabis products. Another example of increased risk is the use of cannabis by children, adolescents and pregnant women, which is associated with a wide range of adverse child health and developmental outcomes (Jaques et al., 2014).

Drugs are always accompanied by risks, and cannabis is no exception. It is important that we improve our understanding of medicinal cannabis users' perspectives, experiences and responses to those health risks. This includes looking into their attitudes and experiences regarding short-term and long-term health risks. In this thesis I examine whether or not the adverse effects documented in previous research are reflected in medicinal users' experiences.

### *1.5 Cannabis products and administration methods*

For a long period, herbal cannabis was the most popular cannabis product among users. The cannabis landscape is changing rapidly as new cannabis products enter the market, including pharmaceutical cannabis-based medicines, cannabis extracts and cannabis-infused products. It is clear that the medicinal cannabis hype has been picked up by commercial corporations specialised in cannabinoid products who

saw profit in targeting medicinal cannabis users. Pharmaceutical companies are aware there is a market share for them as well, as pharmaceutical cannabinoid medicines are on the increase. CBD products have risen strongly in popularity in recent years, due to its supposedly promising medical properties and lack of psychoactive effects.

There are various forms of cannabinoid products, such as raw cannabis (juice), synthetic cannabinoids, hash, oils, concentrated cannabis extracts, ointments, tinctures and edibles, which are administrable through various means, including inhalation, oral ingestion, sublingual ingestion, topical administration, percutaneous absorption, rectal absorption and intravenous injection or infusion.

Popular inhalation methods of cannabis include vaporizing and smoking. One of the advantages of inhaling substances is the rapid onset of action (5-10 min), which makes dose titration possible. Furthermore, the short onset of action is beneficial when a patient needs fast relief (e.g. nausea, acute pain, etc.). When inhaling cannabis, the effects begin to wear off within 2 to 4 hours. Smoking is likely the most commonly used means of administration, but also one of the most unhealthy methods of ingestion (e.g. toxic byproducts and respiratory risks) (MacCallum & Russo, 2018). Herbal cannabis is mainly smoked through joints, and less common smoking methods include pipes, bongs and blunts.

The inhalation method vaporisation has multiple advantages over smoking. Firstly, it can be a partial solution for the noxious gases emitted during combustion when smoking cannabis. When vaporizing cannabis the substance is also inhaled similar to smoking, but it is less heated which prevents certain harmful substances from being combusted (Abrams et al., 2007; Gieringer et al., 2004; MacCallum & Russo, 2018). Secondly, vaporizing enables users to consume standardised doses at a constant temperature (Eisenberg et al., 2014). The typical odours of cannabis smoke can also be reduced when vaporizing, consequently people will draw less attention and are able to use cannabis more discreetly (Morean et al., 2015). This enables them to hide their stigmatised identity of a cannabis user. Currently, there is a rise of clinical trials with inhalation as the method of ingestion (e.g. van de Donk et al., 2019) and scientists have developed sophisticated medical vaporizers which are convenient to use (e.g. Syqe medical© and Volcano Medic vaporizer©), since it is a healthier alternative to smoking.

Cannabis products that are orally ingestible include edibles, capsules, synthetic pills and liquids. Several synthetic cannabinoid medicines are orally administrable in the form of pills (e.g. Marinol® and Cesamet®). Most oral administration routes are convenient to use and can be dosed accurately (MacCallum & Russo, 2018). There are several differences between oral ingestion and inhalation with regards to their effects. The onset of effects from oral administration is slower (60-180 min) compared to inhaling, but the duration of action is sustained longer (6-8 hours) (Grotenhermen, 2001; MacCallum & Russo, 2018). A disadvantage of the delayed onset of action is the difficulty to titrate the dosage. On the other hand, the longer duration of the effect is beneficial when treating chronic symptoms (e.g. chronic pain) and to prevent symptoms (e.g. spasms). An important advantage of oral administration over smoking cannabis is that oral ingestion is a healthier method of delivery. When medicinal cannabis is ingested orally, there is a lower occurrence of certain adverse effects and it avoids respiratory issues (Hazekamp & Pappas, 2014).

Cannabis derivatives which can be consumed through different routes of administration (e.g. inhalation, topical administration and oral ingestion) are cannabis liquids, including cannabis oils. Their popularity is rising strongly among medicinal cannabis users, including children dealing with severe forms of epilepsy (e.g. Dravet Syndrome) for whom other treatments are ineffective. The cannabinoid content of these oils varies. Oils that are dominant CBD delivery methods are called ‘CBD-oils’. These oils contain significant amounts of CBD but low levels of THC (Hazekamp, 2018). The chemical composition with CBD as the main active ingredient, is one of the primary reasons why people prefer the CBD oils. In this way, users can benefit from the therapeutic potential of CBD, without having to deal with the psychoactive effects caused by THC. Other advantages of cannabis extracts are the fact that they can be administered in many ways, they have a less pungent smell than the inhalation of dried flowers, and they can be used discretely and dosed accurately. Finally, concentrated extracts allow the easy ingestion of a larger amount of cannabinoids (Hazekamp, 2018).

The route of administration influences the absorption of cannabis’ active ingredients and the way they are metabolised. Consequently, the effects experienced by the user will differ (MacCallum & Russo, 2018). To date, few studies have investigated the pharmacokinetics and health outcomes of all the different types of administrations methods (Russell et al., 2018). Nevertheless, this knowledge is very important for medicinal cannabis use, and medical cannabis research with different types of ingestion methods is on the rise.

### 1.5.1 Pharmaceutical cannabinoid products

Conventional pharmaceutical medicines are often synthetics based on the active ingredients of plants. Today, many of our present medicines are derived from plants, and researchers are still exploring several species to see if they are of potential for medical use (Harvey, 2008).

It is only recently that researchers have unravelled the chemical structure of the cannabis plant. By exploring the plant, scientists have discovered for some components which particular effects they induce. These discoveries have enabled scientists to isolate cannabinoids and to develop (synthetic) single compound medicines and medicines based on multiple extracts of cannabis. These cannabinoid medicines have diverging chemical compositions and can be used for different medical indications.

Examples of pharmaceutical cannabinoids are Sativex®, Marinol®, Cesamet® and Epidiolex®. The first approved synthetic cannabinoid medicine that came onto the international market was dronabinol under the tradename Marinol®. This pharmaceutical drug is the synthesised form of the active ingredient THC (dronabinol). In countries where Marinol® is a licit medicine (e.g. the US), it is mostly used for the loss of appetite, associated with weight loss in patients with AIDS. It also serves to treat CINV in patients who have not responded to standard treatments (AbbVie Inc., 2015). Cesamet® (brand name of nabilone) is a synthetic agonist for the human cannabinoid receptor CB1 and is based on the structure of THC. The cannabinoid medicine is also indicated as treatment for CINV for individuals who have

not responded adequately to other treatments (Meda Pharmaceuticals Inc., 2016). Cesamet® is only approved in a few countries (e.g. the US, the United Kingdom, etc.) (ProCon.org, 2016). Epidiolex® is a newly developed 99% pure oral CBD extract used to treat seizures associated with Lennox-Gastaut syndrome or Dravet syndrome (Sekar & Pack, 2019).

Sativex® (nabiximols) is an oromucosal spray<sup>10</sup> based on botanical cannabis extracts. The natural extracts in this medicine are THC and CBD, which have approximately equal concentrations in the medicine. This cannabinoid medicine is approved in over 25 countries worldwide. In Europe at least 18 countries have approved the medicine. In most countries Sativex® is approved for the treatment for spasticity due to MS when conventional treatments have proven to be insufficient (GW Pharmaceuticals, 2016). In Belgium, Sativex® is currently the only authorised pharmaceutical cannabis-based medicine (FAGG, 2017).

Cannabinoid pharmaceuticals currently available are based on one or few phytocannabinoids. This means that synergistic effects are largely lacking. Cannabis probably owes its exceptional therapeutic benefits to the fact that it is a polypharmaceutical herb. By interacting, the multiple compounds of cannabis produce synergetic effects or attenuate each other's actions (Russo, 2011). Consequently, when cannabinoids are isolated, desirable effects could be mitigated and side effects could increase.

An important advantage of pharmaceutically-produced medicines is the control that can be exercised over the quality and the standardisation of the substances. In this way, the consumer is ensured that the product is clear of contaminants and that the chemical content is standardised. The production process of pharmaceutical cannabinoids has to meet the same standards that are applied to the production of other pharmaceutical products. Furthermore, clinical evidence regarding safety and efficacy is needed, before the cannabinoid product is allowed to be launched into the market as a medicine. In this way, pharmaceutical cannabinoid medicines have the medical quality equal to other pharmaceutical medicines. For herbal cannabis products it is much more difficult to develop the standardised products necessary for clinical trials (see Bonn-Miller et al., 2018).

### *1.6 Potency*

The potency of cannabis refers to the concentration of its primary psychoactive ingredient, THC. In Belgium, there is no recent information available on the cannabinoid content of illicitly produced cannabis. In 2011, the mean percentage of THC in herbal cannabis was 11% and in hash 12% (De Donder, 2013). Two recent reports from 2018 and 2019 show that both in the US and Europe THC levels have increased significantly during the past ten years (Freeman et al., 2018), with a mean concentration of 17% THC in 2017 in the US. Extremely potent cannabis concentrates are also on the rise (Chandra et al., 2019). Most of the cannabis sold illegally and cannabis products that circulate in pseudo-legal

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<sup>10</sup> Administration via the mucosa of the oral cavity



medicinal cannabis circuits (e.g. cannabis dispensaries in the US) vary in levels of THC but contain negligible or very limited amounts of CBD (Vandrey et al., 2015; Mechoulam, 2012; Freeman et al., 2018). Since cannabis is mainly cultivated for its psychoactive effects and cultivators seek to maximise profits, the amount of THC is high, at the same time the levels of other cannabinoids are reduced. This unbalanced ratio may cause severe anxiety leading to panic reactions in some individuals (Bostwick, 2012). Furthermore, these concentrations might have a negative impact on the synergetic effects of cannabis. THC is the primary psychoactive ingredient of cannabis and has the potential to produce strong mind-altering effects. Some patients do not appreciate these psychoactive effects and consider them unpleasant or unbearable side effects (Allan et al., 2018; Ware et al., 2003a; Page & Verhoef, 2006).

The levels of active ingredients in cannabis plants are influenced by several factors during the cultivation process (e.g. climate, when the cannabis is harvested, etc.) (Growing et al., 1998). The fact that multiple factors determine the content of THC and other cannabinoids causes difficulties for (unprofessional) cultivators to produce replicable levels of certain cannabinoids. Consequently, medicinal cannabis users are likely to be confronted with cannabis products with different potency levels when obtained from unregulated sources and have to learn how to deal with these inconsistencies in their treatment (Elzinga et al., 2015; Jikomes, & Zoorob, 2018; Growing et al., 1998). Mechoulam (2012), a pioneer in medical cannabis research, argues that many cannabis users are not aware of the concentrations of THC and CBD in their cannabis products. This is arguably a disturbing fact, especially for individuals who use cannabis for medicinal reasons, since the relative concentrations are probably important for the physiological and psychological effects the user will experience.

The concentrations of cannabinoids in herbal cannabis are determined by several factors, resulting in the fact that the relative concentrations of the cannabinoids can vary. This variation in the chemical composition of cannabis is essential for the therapeutic and adverse effects it produces (Bidwell et al., 2018). The various cannabinoids which are found in cannabis have different therapeutic properties and cause distinct pharmacological effects (Brunt et al., 2014). Anecdotal and clinical evidence suggests that certain conditions will probably benefit more from the effects of a particular group of cannabinoids, while other diseases are likely in need of higher levels of others (Whiting et al., 2015; Andre et al., 2016; Abrams, 2018). The impact of diverging chemical compositions of cannabis on the effects experienced by users was demonstrated in a study performed by Brunt et al. in 2014. The study findings suggest that individuals who use cannabis strains with low THC levels report less appetite stimulation compared to strains with higher THC levels. The strains with high levels of CBD cause less anxiety according to the respondents.

(Pharmaceutical) companies that produce cannabinoid-based medicines or medical grade cannabis strains vary deliberately the ratio of cannabinoids in their medicines in order to synthesise medicines suitable for different types of conditions and symptoms. For instance, the medicinal cannabis program of the Netherlands offers pharmaceutical grade herbal cannabis with standardised cannabinoid levels produced by the company Bedrocan®. Patients can purchase strains with 22% THC and less than 1% CBD (Bedrocan®); strains with about 13.5% THC and less than 1% CBD (Bedrobinol®, Bedica ®);

strains with 6.5% THC and 8.5% CBD (Bediol®); and strains with less than 1% THC and circa 9% CBD (Bedrolite®) (OMC, 2019). In Sativex®, a pharmaceutical cannabinoid medicine, the ratio of the active ingredients THC and CBD is equal to 1:1, as this ratio would be beneficial to relieve neuropathic pain and spasms experienced by MS patients (Perras, 2005).

### *1.7 Quality, standardisation and consistency*

The quality of cannabis products is in particular important for vulnerable populations, including patients using the products for health purposes. Cannabinoid treatments with a guaranteed medical quality are in all probability cannabinoid medicines produced by pharmaceutical companies and legally approved for medical use. In addition, a safe way to obtain medical grade cannabis is buying standardised medicinal cannabis preparations of which the production is monitored. For instance, research shows that herbal cannabis available in pharmacies in the Netherlands, produced by the private company Bedrocan® under the supervision of the Dutch Office of Medicinal Cannabis is of high quality (Hazekamp, 2006). The cannabis has to be produced in accordance with the EU guidelines for herbal medicines and it has to meet several strict pharmaceutical requirements (Ministerie van VWS & Instituut voor Verantwoord Medicijngebruik, 2010).

In addition to pharmaceutical cannabinoid products and herbal cannabis sold in pharmacies, growing cannabis at home can be considered a relatively safe source of supply. The quality of black-market cannabis is on the other hand rather questionable, since contaminants are rampant in illegal markets (McLaren et al., 2008). In a study conducted by Swift et al. in 2005 in Australia, medical cannabis users believed that cannabis sold by dealers should not be trusted since the cultivators were more concerned about the yield. Therefore, they assumed that dealers would compromise the quality of the cannabis by adding chemicals. In contrast, Page & Verhoef (2006) found in their study that individuals who know their supplier personally do trust the quality of the products they buy.

Caution is warranted with regards to the quality of certain cannabis products, as it can be threatened in multiple ways. When cultivators adulterate cannabis intentionally, or when they do not take proper care of the growing process, harmful contaminants can end up in herbal cannabis products. Biological contaminants such as fungus, moulds, and bacteria, as well as non-biological contaminants, such as heavy metals, glass beads and pesticides, are all potentially harmful substances that have been found in seized cannabis, but also in cannabis sold in Dutch coffee shops and by Canadian licensed cannabis producers (Hazekamp et al., 2005; Hazekamp, 2006; Leung, 2011; McLaren et al., 2008; Hazekamp, 2018). In recent years, quality control also appeared to be a problem in the US, where there are medical cannabis regulations at the level of the states, but no official overarching regulations at the federal level for the production and quality of cannabis products sold in dispensaries and by licensed companies (Troutt & DiDonato, 2015; Lucas, 2012; Grant et al., 2012; Kleber & Dupont, 2012; Jikomes & Zoorob, 2018).

When patients purchase herbal cannabis they can visually inspect, smell and touch the flowers as a form of basic quality control. However, several contaminants are only detectable in professional labs. In the case of cannabis oils quality control is even more problematic, since people cannot visually judge the quality of the cannabis from which the oil is extracted and which chemicals are added. Stores that sell cannabis extracts have the opportunity to hide bad quality, since customers are unable to see the cannabis buds. Currently, there are only few medical grade cannabis oils available (e.g. compounded oils based on the standardised products of Bedrocan®). When regulations regarding quality control for cannabis products are lacking, there is the possibility that people consume cannabis oils derived from contaminated cannabis or which contain potentially harmful residues from the extraction process (Hazekamp, 2018). The same applies to cannabis-infused products, such as edibles and ointments.

Previous studies conducted in the US and Europe suggest that there is a recurring problem with regards to inaccuracies in the labelling of the cannabinoid content of cannabis extracts and cannabis-infused products produced and disseminated in poorly regulated markets. Research shows that the chemical composition of cannabis-infused products (edibles) available in the US deviates from the chemical content presented on their labels (Barrus et al., 2016). Fifty percent of the edible cannabis products, offered in dispensaries operating in the US, contained less cannabinoids than labelled. Other edibles contained higher levels of THC than indicated, which puts the user at risk for unexpected adverse effects (Vandrey et al., 2015). Analysis of Dutch patients' home-made cannabis oils and commercially obtained oils show that the actual cannabinoid content differed strongly from the claimed content on the products' labels (Hazekamp, 2018). A study performed by Elzinga et al. in 2015 in the US suggests that the chemical composition of a particular cannabis strain sold under a popular name (e.g. Kush) varies. This means that the name of a cannabis strain is not a clear indicator of the chemical content of the strain (Elzinga et al., 2015; Jikomes & Zoorob, 2018).

The fact that cannabis products are inconsistent in their chemical composition is probably the result of the lack of quality control, the absence of official standards which define the required consistency of cannabis products, and more generally the unregulated (medicinal) cannabis industry (Bruenig, 2015; Wilkinson & Souza, 2014). There is also no quality assurance of cannabis products that are sold in webstores and through online social networks. Two recent studies from 2017 and 2018, which tested the label accuracy of CBD products offered online, found that (over) two-thirds of the products were mislabelled (Bonn-Miller et al., 2017; Pavlovic et al., 2018). These findings demonstrate the urgent need for quality control and consistent overarching regulations for the unregulated (online) market for (medicinal) cannabis products.

The quality and safety of cannabis should be high priorities for all cannabis users, but in particular for people who are vulnerable due to their health. When the quality of cannabis is substandard using it may be pointless or may even become life-threatening, which is in contrast with its purpose, i.e. improving health. This section shows that the quality of currently available cannabis products is not always guaranteed and that it can be compromised. The present study tries to unravel if medicinal cannabis users are informed about the quality of their products and to what extent they think their cannabis

products meet their quality standards. The concerns of medicinal cannabis users regarding quality and safety issues will be examined. Since the quality of the cannabis products used by the study participants will not be assessed objectively (e.g. lab analysis), I cannot make statements about the quality of the cannabis products consumed by Belgian medicinal cannabis patients. However, that is not the purpose of this study, since we are exploring medicinal cannabis use from the user perspective.

### *Conclusions*

Cannabis contains a wide array of pharmacologically active compounds and generates distinct effects, which makes the plant a potential therapeutic agent for various conditions. Clinical trials show promising results for the therapeutic applications of cannabinoids, including neuropathic pain (e.g. Ware et al., 2010). However, scientific research has not been able to provide conclusive evidence on the therapeutic efficacy and safety of cannabis for many of the conditions for which it is currently used. Clinical studies are limited to certain cannabis products and particular conditions. More large-scale randomised controlled trials, studying cannabinoid medicines with a diverging chemical content used for varying indications, are needed to identify cannabis' therapeutic benefits as well as potential health risks. As cannabis regulations are evolving rapidly all over the world and becoming less strict, I expect that the number of future studies will continue to rise significantly.

Newly developed medical cannabis products and ingestion methods (e.g. vaporisation and oral ingestion of cannabis extracts) are on the rise and spread among their users. The increased diversification of cannabis products and administration methods has implications regarding efficacy and safety as our current knowledge, which is based on use patterns from the past, may not be valid for these emerging cannabis products (Volkow et al., 2016). The research in this field is still ongoing, and many of the different forms of cannabis as well as the methods of administration need further exploration. Most research today is performed with pharmaceutical cannabis extracts and synthetic cannabinoids, and only a few studies have investigated herbal variants (Whiting et al., 2015). There is more high quality research needed that examines cannabinoid botanicals.

People who are in poor health and who use cannabis for medicinal purposes regularly should act carefully since long-term risks have not been established yet. We know from research into recreational use what possible long-term risks could manifest, however this information is not equally applicable to vulnerable populations such as medicinal cannabis users. These people are often chronically or severely ill, deal with specific conditions, suffer from comorbidity, may report concomitant medication use and/or they may have different patterns of use than recreational cannabis users (Wang et al., 2008). In addition, there is currently no data available that explores the health outcomes of long-term cannabis use under medical supervision (Kalant & Porath-Waller, 2016). For this reason there remains a need for high quality clinical research focussing on the medicinal use of cannabis among vulnerable populations

to assess whether patients with compromised health are at greater risk for health hazards associated with cannabis use.

This chapter shows why the chemical constellation and quality of cannabis products are particularly important for medical cannabis users. According to multiple studies, the levels of THC in herbal cannabis products available in unregulated markets have increased significantly in recent years, while the concentrations of other cannabinoids have remained low. The THC:CBD ratio is increasingly leaning towards THC (Chandra et al., 2019), which results in more harmful cannabis products. In addition, The present study does not aim to establish objectively the properties of cannabis products available in Belgium by analysing these products in a lab nor in clinical trials. This study employs a user perspective; this means that the variety of opinions, experiences and knowledge of medicinal cannabis users regarding these topics will be explored. It looks at how these aspects influence their use patterns, their well-being and more generally their daily lives. I explore how people handle the fact that the quality and chemical constellation of their cannabis products is probably unknown. In addition, cannabis products can be labelled inaccurately (Vandrey et al., 2015; Hazekamp, 2018; Barrus et al., 2016) which can lead to under- or overdosing. I look into medicinal cannabis users' knowledge with regards to the different compounds in cannabis and if the chemical composition is important to medicinal cannabis users when purchasing or cultivating cannabis. Finally, I aim to unravel if medicinal cannabis users experience differences regarding therapeutic and adverse effects when using cannabis with varying chemical compositions and by ingesting them with different administration methods.

## 2. Medicinal cannabis users

### *Introduction*

This chapter outlines the profiles and cannabis use patterns of medicinal cannabis users. It starts by describing the relevance and added value of conducting observational studies among medicinal cannabis users alongside clinical research. The chapter then continues by outlining the inclusion criteria commonly used in studies in which surveys and interviews are conducted among medicinal cannabis users. This means that we will look at how a ‘medicinal cannabis user’ is defined in other studies. The next sections discuss previous study findings on medicinal cannabis users’ sociodemographic characteristics and patterns of cannabis use, including routes of administration, forms of cannabis, dose and frequency of use. The chapter then focusses on medicinal cannabis users’ motives for starting and stopping cannabis use. In the subsequent section the symptoms and conditions for which cannabis is currently most commonly used as a treatment will be discussed. A separate section is dedicated to the use of cannabis for mental health purposes, with a particular focus on the self-medication hypothesis. The final section of this chapter focusses on cannabis substitution.

### *2.1 The added value of conducting surveys and interviews among medicinal cannabis users*

Clinical trials are necessary tools to evaluate medicines’ therapeutic effects, side effects and health risks. Researchers and medical professionals argue that there have to be more clinical trials carried out with cannabis before it can be legally distributed among the general population as a therapeutic drug (Fitzcharles et al., 2014a). This is surely a valid argument for safety reasons. However, the use of cannabis dates back thousands of years ago and is currently spread among numerous populations. This means that valuable knowledge can also be gained from the experiences of cannabis users themselves.

What can be learned from medicinal cannabis users’ self-reports? First of all, looking at the results of surveys conducted among medicinal cannabis patients, it appears that the variety of health purposes for which cannabis is used exceeds the number of conditions investigated in clinical trials. Furthermore, the conditions and symptoms reported in surveys by medicinal patients who are certified to use cannabis legally are many times different from, and more diverse than, the approved medical indications and the qualifying conditions to become an officially registered medicinal user (Aggarwal et al., 2013; Troutt & DiDonato, 2015; Newhart, 2013). For example, Clark et al. (2004) found in their survey with MS patients living in Canada that they use cannabis for psychological indications in addition to the symptoms for which cannabis is supposed to be used, which are pain and spasticity. The effects of cannabis on mood, sleep, stress, well-being and anxiety are frequently in the top ten most-cited symptoms for which cannabis is used. Nevertheless, they were most of the time not included as qualifying conditions in medical cannabis programs and less frequently examined in clinical trials. Studies show that these effects can be therapeutically important for medicinal cannabis users in the

healing process in addition to the debilitating symptoms for which cannabis is ‘supposed’ to be used (Clark et al., 2004; Troutt & DiDonato, 2015). In recent years, the number of clinical trials that evaluate the use of cannabinoid medicines for mental health purposes has started to increase.

Next, surveys with medicinal cannabis users show that in countries where individuals can obtain cannabis legally, there is a vast discrepancy between the prevalence of self-reported therapeutic cannabis use and the proportion of patients who obtain their cannabis legally with the support of a physician (Lucas, 2012; Pacula et al., 2016). This implies that even in countries where medicinal use is legal, there is still a large hidden population who obtain cannabis from unregulated sources.

In studies that recruit medical cannabis users through customary communication channels (e.g. media advertisements), psychological disorders are reported more often compared to surveys with individuals holding an authorisation to possess cannabis and when respondents are recruited from clinical settings. This is probably due to the fact that people who want to register as a medicinal user have to deal with qualifying health problems, and psychological problems are less often included (Walsh et al., 2013; Aggarwal et al., 2013). Furthermore, people with psychological disorders face a double stigma. Scientific evidence suggests that individuals with psychological disorders avoid seeking help because of stigma associated with mental illness (Clement et al., 2014). This stigma that comes on top of the stigma related to cannabis may be an obstruction for people to apply for a medical cannabis certificate. Respondents recruited through clinical settings (e.g. an oncology department) will likely report more physical conditions in addition to psychological problems, since they are already in need of clinical treatments.

Without studies relying on surveys, observations, interviews and anecdotal information, important aspects of medicinal cannabis use would be overlooked. These studies can inform scientists about which conditions could be considered for investigation in clinical trials. Furthermore, observational studies can be used to explore if people self-medicate with cannabis to cope with mental health problems off-label, and if the substance is used as a substitute for other substances. With surveys it is possible to inquire whether patients ‘misuse’ cannabis, i.e. for purposes distinct from the reasons for which cannabis is ‘supposed to be used’. In addition, information on medicinal cannabis users’ cannabis use patterns can be used in the development of new cannabinoid products and administration methods.

Soft science can give medicinal cannabis patients a voice and it teaches us more about their needs. Their narratives show the humanity of suffering from a disease and the quest for alternative treatments, instead of a reductionist approach by only focussing on clinical trials and high-tech medicines. For a long time health care was characterised by a lack of attention to patient experiences (Barrett et al., 2003). It has been proven that qualitative research into medical issues is an important source of knowledge. Instead of only looking at the human body and its biochemical reactions, the present study, which utilises the user perspective, allows us to look at the human body in its broader social and psychosocial context. The study focusses on medicinal cannabis users’ choices, preferences, experiences and characteristics in order to get a better understanding of medicinal cannabis use.

## *2.2 Inclusion criteria used in surveys and interviews with medicinal cannabis users*

Many studies have already been conducted in different settings and timeframes that examine the profiles and experiences of medicinal cannabis users. Using quantitative and qualitative research methods, these studies gather self-reports on sociodemographic characteristics, the effectiveness of cannabis, use patterns, etc. In this type of survey research, the inclusion criteria which participants have to meet to qualify as a ‘medicinal cannabis user’ often vary.

First, there are studies that focus on particular patient groups (e.g. MS patients, HIV patients, etc.) about whom it is known that the prevalence of medicinal cannabis use is higher than in the general population (e.g. Clark et al., 2004; Ware et al., 2003). The findings of these studies differ from each other as well as from studies which recruit participants from the general population, because of the participants’ specific medical conditions. For instance, when HIV patients are the research population the most reported symptom for which they use cannabis is often the lack of appetite (Woolridge et al., 2005; Ware et al., 2003; Belle-Isle & Hathaway, 2007; Furler et al., 2004), while among chronic pain patients the most reported symptom is unsurprisingly pain (Ware et al., 2003a).

The second type of studies recruit participants who possess a doctor’s authorisation or prescription which allows them to obtain cannabis from legal sources (e.g. Lucas & Walsh, 2017). Most of these studies are conducted in the US and in Canada, where medicinal cannabis policies are implemented. It is important to note that in studies in which respondents are authorised patients, the different medical cannabis policies influence the research findings with regards to the medicinal cannabis users’ characteristics. For instance, some states in the US have inclusive lists of medical conditions that qualify as approved medical indications for medical cannabis use, while other lists are less inclusive. For example, in 2010 New Mexico was the only state that included PTSD as a qualifying condition and 38.5% of the registered medical cannabis users fell into this category (Bowles, 2012).

In the third type of studies respondents identify themselves as medicinal cannabis users, without having to prove that they are authorised or ‘legitimate’ medicinal cannabis users. The label ‘medical’ is defined by the participant her- or himself. In these studies respondents are recruited from the general population through self-selected participation (e.g. Swift et al., 2005; Lucas, 2012; Walsh et al., 2013).

This variation in the definition of a ‘medicinal cannabis user’ is likely to have implications for the research findings regarding the profiles, patterns of use and experiences of medicinal cannabis users. The study of Hazekamp & Heerdink (2013) that used objective data of purchases of cannabis from Dutch pharmacies, suggests that patients who purchase cannabis in pharmacies were more likely to be female and older, and obtained smaller doses of cannabis compared to the results of surveys based on self-selected participation. The two authors argue that surveys based on self-selected participation probably attract more male and young cannabis users who are in favour of cannabis use.

In the following parts of this chapter I discuss the findings of studies using one of the three recruitment methods discussed above. This will improve our understanding of the profiles, experiences and patterns



of use of medicinal cannabis users. It will become clear that studies using different research methods still report similar findings and trends regarding diverse topics. Alongside survey findings, other sources, including official registration data from medicinal cannabis programs, are explored.

### *2.3 Medicinal cannabis patients' profiles*

Previous studies conducted in Western societies indicate that medicinal cannabis users' profiles resemble those of the general population (Zaller et al., 2015; Grella et al., 2014; Reinarman et al., 2011). These studies indicate that the majority of medicinal cannabis users are males, have a white ethnicity and are in their middle adulthood (Grotenhermen & Schnelle, 2003; Swift et al., 2005; Reinarman et al., 2011, Cranford et al., 2016; Ogborne et al., 2000; Hazekamp et al., 2013; Lucas, 2012, Zaller et al., 2015; Lucas et al., 2019; Lintzeris et al., 2018; Troutt & DiDonato, 2015).

Most medicinal cannabis users consume cannabis for the first time in their teens (Howard et al., 2005; O'Connell & Bou-Matar, 2007; Grella et al., 2014). They often have a (long) history of cannabis use. The majority have used cannabis recreationally prior to the start of their medicinal use (Lucas, 2012; Reinarman et al., 2011; Grotenhermen & Schnelle, 2003; Walsh et al., 2013; Allegretti et al., 2013; Grella et al., 2014). A significant number of medicinal cannabis users discover or redefine the therapeutic effects of cannabis as a spin-off from recreational use and self-medicate with cannabis (Swift et al., 2005; Ogborne et al., 2000; Lankenau et al., 2018a). A much smaller group start using cannabis recreationally after their experience with medicinal use (Reinarman et al., 2011). A significant number continue to use cannabis recreationally concurrently with their therapeutic use (Boehnke et al., 2019; Lintzeris et al., 2018; Piper et al., 2017). Other medicinal cannabis users have never used cannabis recreationally and cannot handle the 'side effects' yielded by cannabis, in particular the psychoactive effects (Bar-Sela et al., 2013; Newhart, 2013; Page et al., 2003).

Several studies have analysed the profiles of (medicinal) cannabis users by identifying differences in particular patient populations (e.g. MS patients) between cannabis users and non-users (e.g. Fiz et al., 2011; Waissengrin et al., 2015; Weiss & Friedenberg, 2015; Ware et al., 2003a). The results of these studies are mixed. Studies carried out with patients living with fibromyalgia, cancer and MS show that the demographic and clinical characteristics of non-users are similar to those of cannabis users (Fiz et al., 2011; Waissengrin et al., 2015; Consroe et al., 1997). In contrast with these research findings, Page et al. (2003) found that among Canadian MS patients, the patients who were older and had higher incomes were significantly less likely to use cannabis. A study conducted in the US suggests that patients living with inflammatory bowel disorder (IBD) who use cannabis, are younger and more likely male compared to non-using patients (Weiss & Friedenberg, 2015). Finally, the study of Ware et al. (2003a) found differences in the characteristics of Canadian patients dealing with non-cancer pain. The study findings suggest that medicinal cannabis users tend to be younger and smoke more tobacco compared to non-users.

### 2.3.1 Patterns of use

#### 2.3.1.1 Routes of administration and cannabis products

The (medical) cannabis industry is booming nowadays in different parts of the world, in particular in the US. This becomes clear looking at all the commercialised cannabis extracts and cannabis-infused products, ranging from edibles and beverages to oils, ointments, suppositories, etc. In addition to these newly developed cannabis products, traditional herbal cannabis strains remain popular among medicinal cannabis users. This section outlines the most relevant cannabis products and methods of delivery of cannabis used for medical reasons.

First, it is important to note that among medicinal cannabis users, utilizing multiple administration methods to consume cannabis products seems to be the norm (Swift et al., 2005; Lintzeris et al., 2018). Earlier research shows that the most popular route of administration is inhalation (Lintzeris et al., 2018). Looking at the different types of inhalation, it is clear that smoking cannabis dominated in survey studies in previous years (Swift et al., 2005; Ogborne et al., 2000; Lucas, 2012; Reinerman et al., 2011; Grotenhermen & Schnelle, 2003; Howard et al., 2005, Allegretti et al., 2013; Troutt & DiDonato, 2015; Zaller et al., 2015). The main reasons why patients prefer smoking over other ingestion methods are its effectiveness for symptom relief, the rapid onset of the effects, cost-effectiveness, and the fact that users are able to self-titrate easily (Swift et al., 2005; Ogborne et al., 2000; Kalant, 2001). Earlier studies show that a minority of the medicinal cannabis users vaporise cannabis (Reinerman, et al., 2011; Troutt & DiDonato, 2015; Cranford et al., 2016, Sznitman, 2017; Pacula et al., 2016). However, recently vaporizing is becoming a more popular ingestion method among medicinal cannabis users (Lucas et al., 2019).

After inhalation, the second most frequently used administration method among medicinal cannabis users is oral ingestion (Reinerman et al., 2011; Grella et al., 2014). The number of people who ingest cannabis orally is considerably lower than those who inhale it. Additionally, oral ingestion on a regular basis is uncommon (O'Connell & Bou-Matar, 2007). Popular oral ingestion methods are edible and potable products, such as baked goods and tea (Hazekamp et al., 2013; Swift et al., 2005). Medicinal users prefer to eat or drink cannabis-infused products when they are in public as they are easier to ingest and less obvious than inhaling (Swift et al., 2005). Reasons why edible products are less preferred than inhaling is probably due to their slow and erratic absorption, because they are difficult to prepare, control, and titrate, and are less effective (Kalant, 2001; O'Connell & Bou-Matar, 2007; Coomber et al., 2003).

The market for cannabis infused products and extracts has shown an exponential growth in past few years. Future studies will have to show if this is translated in self-reported medicinal cannabis use patterns. In previously conducted surveys there was often no specific focus on cannabis extracts such as liquids, or they were less frequently cited than the ingestion methods discussed above (Lintzeris et al., 2018; Grella et al., 2014). Other less popular ingestion methods and cannabis products utilised by

medicinal cannabis users are topicals, suppositories, fresh juice, sprays, tablets/capsules and dabbing (Lintzeris et al., 2018).

#### *2.3.1.1.1 Pharmaceutical cannabinoid drugs versus herbal cannabis*

Previous studies have examined the experiences of medicinal cannabis users with the use of pharmaceutical cannabinoid drugs (Hazekamp et al., 2013). The earlier pharmaceutical cannabinoid medicines that were created as substitutes for herbal cannabis did not always fulfil the needs and expectations of patients. Herbal cannabis was frequently preferred above single compound synthetic cannabinoid medicines, because the latter fail as fully fledged alternatives (Ware et al., 2003; Hazekamp et al., 2013). In a previous international study with self-selected medicinal cannabis users, the participants were more satisfied with the side effects of herbal cannabis compared to the side effects of pharmaceutical cannabinoid products (Hazekamp et al., 2013).

Many medicinal cannabis users believe that herbal cannabis generates the most beneficial health outcomes. In a survey from 2005 conducted in Australia, medicinal patients agreed on the fact that the best method for using cannabis was achieved by keeping the herbal cannabis plant in its holistic and natural state (Swift et al., 2005). According to some users, synthetic drugs will never become satisfying alternatives, because of the chemical agents that are added and the omission of certain natural properties. For others, the ritual which goes along with consuming the cannabis plant (e.g. smoking) is part of the healing process. These findings illustrate that the therapeutic potential of cannabis is subjective and difficult to identify since its beneficial effects are not only attributable to single active compounds (Swift, et al., 2005).

Medicinal cannabis users appear to appreciate the ‘green’ and ‘natural’ values of herbal cannabis (Pedersen & Sandberg, 2013; Coomber et al., 2003; Grotenhermen & Schnelle, 20003; Bortorf et al., 2009; Dahl & Frank, 2011). The trend nowadays to choose natural products that have therapeutic benefits instead of synthetic products is reflected in the use of herbal cannabis. Artificial products fabricated by humans are perceived as a greater threat for a healthy lifestyle. In addition, herbal medicines are considered holistic (Vickers et al., 2006). Commercial companies specialising in cannabis products are aware of this ‘green trend’ and respond to it. For instance, in cannabis extracts and cannabis-infused products, the additive substances are also often ‘natural’ products (e.g. olive oil).

The route of administration is also likely to play an important role in the preference for herbal cannabis. The first pharmaceutical cannabinoid preparations (e.g. Marinol®) were produced as pills, which are only orally ingestible. This engenders problems for certain patients, such as individuals who experience severe nausea and are not able to swallow pills. Another disadvantage of ingesting cannabis in the form of pills is the delayed onset of effects compared to inhalation. This can be a significant drawback when patients need fast relief (e.g. acute pain). Inhaling standardised cannabinoid-based medicines or cannabis extracts through a medically tested device, might be a healthier solution for the respiratory problems

raised by smoking herbal cannabis. In this way, patients can self-titrate their dose, which is also more difficult when orally ingesting pharmaceutical pills. Another possible reason for individuals to continue using herbal cannabis is the lack of variety in the chemical content of pharmaceutical cannabis medicines currently available to patients (Hazekamp et al., 2013). There are countless varieties of herbal cannabis products with different chemical compositions, which can be ingested through different administration methods.

The fact that people prefer herbal cannabis might be reflected in the large number of people who use herbal cannabis compared to pharmaceutical cannabinoids, as found in previous studies (Ware et al., 2003; Lucas, 2012; Belle-Isle & Hathaway, 2007; Grotenhermen & Schnelle, 2003; Hazekamp et al., 2013). Research in Canada and Germany indicates that over 80% of the medicinal cannabis users never use synthetic pharmaceuticals on a regular basis, whereas herbal cannabis is used regularly (Lucas, 2012; Grotenhermen & Schnelle, 2003). Consistent with these findings, a large-scale international study conducted by the International Association for Cannabinoid Medicines (IACM) in 31 countries found that herbal cannabis was used much more often than synthetic cannabinoid medications. The researchers of the IACM survey state that this might be due to other reasons beside preference. It is possible that a significant number of people have never had the chance to try a pharmaceutical cannabinoid product (Hazekamp et al., 2013). In the study of Lucas (2012) in Canada, the majority of medicinal cannabis users had never tried cannabinoid-based pharmaceutical medicines. It is important to note that most of these results come from studies conducted when only few cannabinoid-based medicines were available. Research results might change when users will have access to a broader variety of affordable pharmaceutical cannabinoid medicines. Further research is needed to investigate if the large number of herbal cannabis users is due to the preference for herbal cannabis or the lack of available cannabinoid medicines. An advantage of pharmaceutical cannabinoid medicines reported by medicinal cannabis users themselves is the ease of preparation and intake of the products (Hazekamp & Pappas, 2014).

Until very recently, pharmaceutical cannabinoid products were the only cannabinoid products with a legal status. The illegal status of herbal cannabis was one of the most important reasons why people opted for pharmaceutical cannabinoid medicines (Grinspoon, 2000). Because of the legal status of pharmaceutical cannabinoids and their medical image, they can be clearly separated from recreational cannabis use (Growing et al., 1998). This is important for patients who experience stigma due to the use of herbal cannabis. Cannabinoid pharmaceuticals will be less associated with an illegal mood-altering drug and the social use of cannabis. Research indicates that the administration methods of cannabis have an influence on the acceptance and the stigma associated with cannabis. Pharmaceutical cannabinoids are in favour since pills and oral suspension are more socially accepted and less stigmatised than other administration forms of cannabis (e.g. smoking and edibles) (Rudski, 2014).

In conclusion, it is unsurprising that individuals who are dissatisfied with pharmaceutical cannabinoid products will return to herbal cannabis, whether or not the plant is legally approved. Regulating pharmaceutical cannabinoid medicines will not provide a solution. Whether people prefer to use herbal

cannabis or chemical derivatives, it is vital for the users' health that they consume cannabis products that are safe and most beneficial for their conditions and symptoms.

### 2.3.1.2 Dose and frequency of use

Herbal cannabis products obtained from unregulated sources are rarely standardised. Instead, they have a varying consistency. Therefore, in these circumstances it will be hard to find two cannabis plants with identical cannabinoid concentrations. This may cause difficulties for cannabis users to measure a dose which will produce the most beneficial therapeutic effects and the least side effects. Most users go through a process of trial and error before they discover optimal cannabis use patterns which work best for them (Athey et al., 2017).

Previous studies show that the preferred optimal dose of herbal cannabis varies among medicinal users. Whereas a significant number of individuals use a relatively small daily dose of less than or about one gram, a much smaller group consume over 2 grams a day (Hazekamp et al., 2013; Hazekamp & Heerdink, 2013; Reinerman et al., 2011; Walsh et al., 2013; Clark et al., 2004; Lucas et al., 2019). Medicinal users manage their cannabis dose in relation to symptom relief. This dose stays consistent most of the time (Grotenhermen & Schnelle, 2013), but when the potency varies the dose will be adjusted (Coomber et al., 2003).

Most medicinal cannabis users are daily users, others use several times a week or less (Lucas, 2012; Reinerman et al., 2011; Ware et al., 2005; Belle-Isle & Hathaway, 2007; Zaller et al., 2015; Troutt & DiDonato, 2015). A significant number use cannabis multiple times a day (Reinerman et al., 2011; Walsh et al., 2013; Brunt et al., 2014; Zaller et al., 2015; Lucas et al., 2019). In this case cannabis can be used as a 'maintenance treatment' for controlling and preventing symptoms in order to facilitate normal functioning (Page & Verhoef, 2006; Coomber et al., 2003). Individuals who inhale cannabis or use sublingual products require more administrations per day compared to oral use (Hazekamp et al., 2013). Many medicinal cannabis users consume cannabis primarily in the evenings or before retiring for the night. In addition, a significant number consume cannabis depending on the need to relieve medical symptoms (Page & Verhoef, 2006; Howard et al., 2005; Ware et al., 2005; Reinerman, 2011; Wooldridge et al., 2005; Coomber et al., 2003).

There is thus far no conclusive information available for physicians and patients on the recommended use patterns of herbal cannabis products (Fitzscharles et al., 2014; Bruenig, 2015). Physicians have no reliable information regarding dose, frequency of use, contraindications, etc. (Bonn-Miller et al., 2018). There exist some vague guidelines for the medicinal use of cannabis developed by clinicians which are based on 'start low and go slow' and auto-titration (Aggarwal et al., 2009; MacCallum & Russo, 2018). These guidelines may be effective for the relief of symptoms patients obviously feel need to be relieved (e.g. nausea or acute pain), however symptoms that are less predictable or noticeable to the patient (e.g. intraocular pressure or epilepsy attacks) probably need a predetermined or a known dose. More recently

scientists have started to develop more specific dosing recommendations and guidelines for prescribing cannabis (see MacCallum & Russo, 2018; Kahan et al., 2014).

### 2.3.2 Motives to start and stop using cannabis

Why do people choose cannabis as a treatment when sound scientific evidence is lacking, and their use is not supported by medical professionals, stigmatised and/or illegal? The ineffectiveness of conventional treatments and/or their intolerable side effects are the most common reasons for patients resorting to medicinal cannabis use (Coomber et al., 2003). Many times, people who deal with debilitating symptoms have tried several conventional treatments. When they do not succeed in finding an effective treatment they turn to alternative treatments, such as cannabis, as their last hope (Malassiotis et al., 2005).

A nationwide study conducted in the UK with 948 participants shows that a large number of individuals decide to try cannabis as a treatment because a friend, family member or acquaintance suggested it. Many try it because they have read about it in a book or in an article (Ware et al., 2005). Israeli cancer patients using cannabis for health purposes were recommended by their oncologist to use cannabis or were convinced by non-medical sources (e.g. media, other patients and family members) (Waissengrin et al., 2015). A substantial group find out about the therapeutic qualities of cannabis while using it for recreational purposes (Ware et al., 2005; Page et al., 2003).

Previous studies illustrate that people who could benefit from cannabis, but who have never tried it, are restrained by concerns about adverse effects, the lack of knowledge on how to obtain it, costs, disbelief in effectiveness and the illegal status of cannabis (Page et al., 2003; Belle-Isle & Hathaway, 2007). Important motives to stop using cannabis are similar to these reasons, i.e. the inability to find regular supply, the inability to afford cannabis, the dislike of side effects, the lack of effectiveness and the psychoactive experience of the 'high' (Ware et al., 2005; Page et al., 2003; Bar-Sela et al., 2013; Allegretti et al., 2013; Swift et al., 2005). Concerns about the risks because of the illegal status of cannabis is also a common reason for people to quit. Finally, people stop using cannabis because their symptoms have improved to the point they no longer needed cannabis as a treatment (Allegretti et al., 2013).

In the present study I look at the main motives of self-identified medicinal cannabis users for choosing a cannabis treatment, and the ways through which they were introduced to the therapeutic utility of cannabis. When individuals ended their cannabis use or had temporary periods when they quit their use, I aim to identify the underlying reasons for these decisions.

### 2.3.3 Medicinal cannabis users' conditions and symptoms

In the first chapter of this literature review we saw that because of cannabis' complex bio-chemical structure, and because the human endocannabinoid system is involved in multiple functions of the human body and brain, cannabis products might have therapeutic potential for various conditions and symptoms.

In studies in which medicinal cannabis users are surveyed, the results show a wide range of symptoms and conditions for which the substance is used. The following conditions and symptoms are reported most often: depression, stress, anxiety, chronic pain, HIV, arthritis, migraine, weight loss, MS, sleep disorders, nausea, spinal cord injuries and spasms (Lucas et al., 2019; Swift et al., 2005; Ogborne et al., 2000; Hazekamp et al., 2013; Lucas, 2012; Reinerman et al., 2011; Grotenhermen & Schnelle, 2003; Walsh et al., 2013; Aggarwal et al., 2013; Aggarwal et al., 2009; Grella et al., 2014; Prentiss et al., 2004; Lintzeris et al., 2018). Chronic pain is frequently listed as the number one condition for which cannabis is used, followed in random order by depression, anxiety and sleep disorders (Webb & Webb, 2014; Cranford et al., 2016; Troutt & DiDonato, 2015; Nunberg et al., 2011). In addition to these frequently cited conditions, there are over two hundred other symptoms and conditions for which medicinal cannabis is used as a treatment (Aggarwal et al., 2009), but which are less commonly reported.

Most medicinal cannabis users use cannabis for multiple symptoms and/or conditions (Swift et al., 2005; Lucas, 2012). Severely ill people who treat their physical conditions in the first place with cannabis, also seem to use it in order to control their mental health (Lucas, 2012). For instance, cancer patients may use cannabis to prevent nausea arising from the chemotherapy and for pain, but at the same time they may use it to counteract depressed moods or to improve sleep (Schleider et al., 2018). The diseases and disorders treated with cannabis are often treated concurrently with standard and/or complementary treatments (Piper et al., 2017; Lucas et al., 2019; Reinerman et al., 2011; Newhart, 2013).

In medicinal cannabis studies in which cannabis users are recruited through non-medical institutions (e.g. personal networks or media advertisements) it is likely that a significant number have not been officially diagnosed by a physician. In the study performed by Pedersen (2015) in Norway a large number of cannabis users reported using cannabis for medical purposes. Attention deficit hyperactivity disorder (ADHD) was commonly reported by the participants as a condition for which they used cannabis. However, the majority were not officially diagnosed with this disorder and thus self-diagnosed this condition. On the other hand, Hakkarainen et al. (2015) conducted an international survey with self-selected cannabis growers. Their study showed that three out of four of the medicinal cannabis growers reported that they were diagnosed by a physician. Almost twenty percent had no medical diagnose.

In order to understand why cannabis can be used as a treatment, it is important to know which specific therapeutic effects cannabis generates. Studies which examine subjective drug effects can provide valuable knowledge by identifying the self-reported experiences of medicinal cannabis users after consuming cannabis. The most frequently cited effects are: improved appetite, relaxation, sleep and

mood, and the reduction of pain, stress, anxiety, muscle spasms, tremors, nausea, vomiting and numbness (Page & Verhoef, 2006; Reinerman, 2011; Brunt et al., 2014, Waissengrin et al., 2015; Westfall et al., 2006; Fiz. et al., 2011; Consroe et al., 1997; Ware et al., 2003). The duration of these effects varies from a couple of hours to a longer than 24 hours (Page & Verhoef, 2006).

Cannabis is most often used to control symptoms and to improve quality of life rather than curing diseases (Swift et al., 2005). When patients' symptoms are controlled they are able to undertake their daily tasks more easily, which is important for their wellbeing (Dahl & Frank, 2011). Cannabis' impact appears to go beyond therapeutic effects as it helps individuals to function better and it enhances their productivity (Chapkis, 2007; Newhart, 2013).

Survey findings suggest that medicinal cannabis users are overall satisfied with cannabis' therapeutic properties (Zolotov et al., 2016; Grotenhermen & Schnelle, 2003). Many users report high efficacy of cannabis in relieving symptoms (Bar-Sela et al., 2013; Allegretti et al., 2013; Troutt & DiDonato, 2015; Brunt et al., 2014; Grotenhermen & Schnelle, 2003; Ware et al., 2005). Bonn-Miller et al. (2014) discovered that medicinal cannabis users living in the US thought that cannabis was most effective for appetite loss in comparison with other therapeutic effects. Ware et al. (2005) found in their study, with a large sample of 948 self-reported medicinal cannabis users living in the UK, that 68% of the respondents thought that cannabis made their symptoms overall much better, 27% a little better, 4% said it made no difference, and 1% reported that it made their symptoms a lot worse or much worse. One study showed that when cannabis is consumed through inhalation, individuals report in particular high effectiveness rates (Swift et al., 2005). Another aspect that indicates that cannabis is perceived as effective in relieving symptoms, is the fact that medicinal cannabis users report that their symptoms worsen when they stop using cannabis (Ware et al., 2005; Consroe et al., 1997).

Nevertheless, these positive results should be interpreted with caution, since most medicinal users participate voluntary in these observational studies. Positive attitudes towards cannabis can be biased since individuals who quit using cannabis medicinally, because of dissatisfaction with therapeutic efficacy or adverse effects, will be less likely to participate. There are a few studies that present results which are not only in favour of cannabis. For instance, Leroux et al. (2012) conducted a survey among patients with cluster headaches in France. The study findings show that for some patients cannabis had limited efficacy when used to treat headache attacks and even worsened or triggered them. In the study of Consroe et al. (1997) in which MS patients living in the UK and US were surveyed, there were some patients who did not experience benefits for their symptoms after smoking cannabis. Self-described medicinal cannabis users participating in the study performed by Swift et al. (2005) in Australia mentioned that cannabis was not helpful in relieving particular symptoms.

The purpose of the present study is not to measure the efficacy of cannabis but to identify the experiences of medicinal cannabis users with the therapeutic effects of cannabis. Surveys and interviews are inadequate to objectively establish cannabis' effectiveness and safety. However, asking patients about the subjective effects of cannabis and its efficacy identifies patients' experiences with regards to the use of cannabis. According to Barnes (2000), it is a matter of phenomenology, in which patients are



obviously the best judge. Phenomenology differs from the traditional medical view of the body, that most of the time looks solely to the physical body. This perspective can be in conflict with the patient's view, who experiences the illness as having an impact on all dimensions of daily life and not only the physical (e.g. the psychological, social, cognitive and emotional dimensions) (Carel, 2011).

The present study aims to identify the medical indications for which cannabis is used, and if these reflect the findings from previous studies conducted abroad. The perceived therapeutic efficacy of cannabis is examined alongside the wider impact of using cannabis therapeutically on self-identified medicinal cannabis users' quality of life. Finally, the satisfaction of medicinal users with the therapeutic effects of cannabis is investigated, and which aspects of using cannabis medicinally are considered most important.

#### 2.3.4 Self-medication hypothesis

Throughout history herbal medicines have been used often to treat psychological problems, such as depression, stress and anxiety (Vickers et al., 2006). Research suggests that a significant number of cannabis users who suffer from psychological disorders use cannabis, and in particular depressed individuals (Lazareck et al., 2012). However, when cannabis is used by individuals living with mental health problems, it is not always clear whether cannabis is used as a form of self-medication or for the same purposes reported by healthy cannabis users.

Research suggests that the rates of psychiatric disorders are significantly higher among people who use or abuse psychoactive drugs in comparison with the general population, also known as the 'dual diagnosis' (Buckley, 2006). The *self-medication hypothesis* (SMH) is a theory that provides a possible explanation for the high level of substance (ab)use among populations living with mental disorders. This theory tries to explain the behaviour of individuals who self-medicate with mood alternating drugs to address psychological disorders. According to this theory psychoactive substances are used to ameliorate mental suffering and to modulate distressful emotions. The drugs function as emotion stabilisers and are used to counteract the symptoms of psychological disorders for people who are not able to manage psychological states (Suh et al., 2008).

Studies show that self-medication practices with cannabis often coexist with psychiatric disorders and psychological conditions, diagnosed or undiagnosed (Pedersen, 2015; Lazareck et al., 2012). Some people who already use cannabis recreationally experience that their mental health problems are (positively) influenced by cannabis. Consequently, they use the drug deliberately to manage their mental disorder or psychological symptoms. For instance, in the study of Pedersen (2015) conducted among cannabis users living in Norway a number of the participants stated that they used cannabis as a form of self-medication to treat self-diagnosed ADHD.

Many times individuals self-medicate with cannabis for psychological disorders that cause mental distress and anxiety (Bonn-Miller et al., 2014). The study of Cougle et al. (2011) revealed a relation

between post-traumatic stress disorder (PTSD) and lifetime cannabis use, which may be an indication of coping behaviour for stress symptoms. In a study performed by Bonn-Miller et al. (2014) medicinal cannabis users dealing with traumatic intrusions and social anxiety thought that cannabis was helpful in relieving symptoms. These findings may support the SMH, i.e. that the substance is used to modulate distressful effects, such as anxiety and stress. In addition to the use of cannabis for coping with stressful emotions, it is also used to counteract positive symptoms in psychotic disorders. The study of Buadze et al. (2010) found that a significant number of people dealing with psychotic disorders use cannabis to mitigate hallucinations. Interviews with individuals dealing with schizophrenia show that they regard their use as self-medication or self-regulation (Buadze et al., 2010). It is not clear yet if cannabinoid medicines are successful remedies for these mental health disorders, and there are still only a handful of clinical studies covering this research area.

Research findings on the use of cannabis by individuals suffering from mental health problems do not always support the self-medication hypothesis. The study of Buadze et al. (2010) showed that the majority of individuals living with psychotic disorders use cannabis for the same reasons as healthy individuals (e.g. to relax, social motives, etc.). Arendt et al. (2007) examined in their study the interplay between psychopathology, reasons for use and the reactions caused while intoxicated by cannabis. They found that individuals with a substance dependence use cannabis to relieve depression among other purposes, but do not specifically self-medicate for depression. When they were under the influence of cannabis they experienced rather an increase of adverse symptoms instead of specific symptom relief.

Self-medication with psychoactive drugs to alleviate emotional distress or to tackle other psychological symptoms is not without risks. It can be the underlying cause of particular mental health problems, which leads to a vicious circle. The use of psychoactive substances to self-medicate psychological problems can even worsen instead of improving them. In addition, it is associated with a greater risk of substance abuse, dependence and problematic use (Lazareck et al., 2012). Medicinal cannabis users with heightened depression symptoms are shown to have greater problematic cannabis use (Babson et al., 2013). Studies indicate that individuals who suffer from anxiety disorders and self-medicate with cannabis or other psychoactive drugs are five times more at risk of developing substance dependence than anxious individuals who do not (Bostwick, 2012). A study conducted by Bonn-Miller et al. (2014), found that 21.7% of the medicinal cannabis users met criteria for cannabis abuse and 16.1% were cannabis dependent. This implies that 37.8% of the sample met criteria for a cannabis use disorder. Other research indicates that high social anxiety individuals who use cannabis to cope with social situations or avoid social situations when cannabis is unavailable, are vulnerable to cannabis-related problems (Buckner et al., 2012). In the study of Bortorf et al. (2009) teens who used cannabis to cope with emotional distress were concerned that they relied on the drug for minor and normal feelings (e.g. stress). This study was performed in Canada, where medicinal cannabis use is integrated and where cannabis is available for teens. The authors argue that in other social contexts teens would use other coping strategies for their psychological problems.

### 2.3.5 Cannabis substitution

Previous studies show that cannabis is often used as a therapeutic substitute for other substances. A study conducted in Canada, found that approximately 87% of the self-identified medicinal cannabis users substitute particular substances with cannabis (Lucas et al., 2016). These include licit psychoactive substances (e.g. alcohol), illicit psychoactive substances (e.g. cocaine) and pharmaceutical medicines (e.g. opioids). Alcohol and prescription drugs are replaced most often by cannabis (Nunberg et al., 2011; Grella et al., 2014; Reiman, 2009; Lucas et al., 2019).

Cannabis is mostly used as a substitute for prescription drugs (Lau et al., 2015; Lucas et al., 2016; Grella et al., 2014). Previous studies based on self-reports suggest that about fifty to seventy percent of the medicinal cannabis patients substitute prescription drugs with cannabis (Reiman, 2009; Reinarman, 2011; Grella et al., 2014; Zaller et al., 2015; Lucas et al., 2019; Nunberg et al., 2011). The use of cannabis enables users to reduce the use of pharmaceutical drugs (Lucas, 2012; Troutt & Didonato, 2015; Webb & Webb, 2014; Piper et al., 2017). Cannabis is used many times in conjunction with prescription drugs in order to lower the use of the latter (Lau et al., 2015). Medicinal cannabis users claim that the use of cannabis enables them to lower their use of prescription medicines, because of cannabis' safety, superior therapeutic effects and less severe side effects (Nunberg et al., 2011; Aggarwal et al., 2009; Swift et al., 2005; Reiman, 2009; Lucas et al., 2016; Lucas et al., 2019). In addition, cannabis is utilised to counteract the adverse effects of prescription drugs and other conventional therapies (Ware et al., 2003; Dahl & Frank, 2011).

Studies indicate that the largest group of people who replace prescription drugs with cannabis are individuals who use the substance for pain relief (e.g. opioids) (Lucas et al., 2016; Lucas et al., 2019; Piper et al., 2017). The study of Piper et al. (2017) shows that medicinal cannabis users living in the US self-reported a reduction in antidepressants, anti-anxiety, migraine and sleep medications, however these reductions were significantly lower than the decrease in opioids. In a study from 2017 conducted in California, medical patients reported that cannabis was equally effective in relieving pain compared to opiates, without causing unwanted side effects. The majority were able to reduce their opiate use when consuming cannabis (Reiman et al., 2017). Other scholars have argued that opioids can be replaced with cannabis as a harm reduction strategy and believe this replacement may lead to a reduction in the mortality rates associated with prescription pain medication. They stress the importance of research focussing on the substitution of opioids with cannabis in the importance of public health (Collen, 2012; Lucas et al. 2016). The substitution of opioids with cannabis might be reflected in the opioid overdose mortality rates of the US. In states where cannabis is approved for medicinal purposes the mortality rates are significantly lower in comparison with states without medicinal cannabis laws (Bachhuber et al., 2014). Hurd et al. (2015) argue that CBD can be a potential beneficial treatment for opioid abuse and for opioid-dependent individuals.

Cannabis substitution can also function as a harm reduction strategy for the recreational use of other psychoactive substances. Statistics show that in certain states in the US the increase in cannabis use

happened simultaneously with the decrease of tobacco and alcohol use. These numbers may indicate that people use cannabis as a substitute for tobacco and alcohol (O'Connell & Bou-Matar, 2007). Lucas (2019) found among 2032 registered Canadian medical cannabis users that tobacco was substituted by about one third of the participants who smoked. In studies conducted at medical cannabis dispensaries located in the US and among registered Canadian medical cannabis patients, approximately forty percent of the medicinal cannabis patients substituted alcohol with cannabis (Reiman, 2009; Grella et al., 2014; Lucas et al., 2019). In other studies medicinal cannabis users reported that their alcohol consumption had reduced since they started using cannabis for medicinal purposes (Piper et al., 2017). In addition, Lenza (2007) found that alcoholics replaced their alcohol use with cannabis and that they integrated themselves successfully into social and professional life. Based on a literature review on cannabis substitution, Subbaraman (2014) concludes that cannabis can be a potential safer substitute for alcohol, but that more research is needed.

Finally, previous research suggests that some individuals use cannabis to counteract the effects of other psychoactive drugs when their effects become too intense (Lau et al., 2015). Reiman (2009) argues that substitution with cannabis might be a realistic alternative to abstinence for individuals who do not wish or are not able to stop using psychoactive substances. Similarly, Lucas et al. (2016) argue that since cannabis is used as a harm reduction strategy, when it is utilised as a substitute, the requirement for abstinence in substance treatment might have to be reconsidered. The study performed by Swartz in 2010 shows that medicinal cannabis users who are in substance abuse treatment do not have lower results for their therapy outcome compared to non-users. However, the study sample was small.

### *Conclusions*

International research has gathered considerable knowledge on the characteristics, use patterns and experiences of medicinal cannabis users. However, to date no such studies have been conducted among self-identified medicinal cannabis users living in Belgium. This study aims to fill in this gap by exploring their conditions and symptoms, use patterns and motives for use. By examining the same research topics that have been studied abroad it is possible to compare my research findings with international research.

In the current study I look at medicinal cannabis use patterns. This includes the routes of administration and the cannabis products most commonly utilised by self-identified medicinal cannabis users. The reasons why certain ingestion methods and forms of cannabis are preferred will be identified. The preferred or most-used administration methods and cannabis products might be influenced by the lack of variety in products available to medicinal cannabis users in Belgium. For instance, in the United States the prevalence of cannabis vapourisation is higher in states that have legalised cannabis (Cranford et al., 2016). This chapter shows that pharmaceutical cannabinoid medications are less appreciated by medicinal cannabis users and consequently less integrated. Several factors contribute to explain why they are currently less successful, including their chemical composition, methods of administration,

effectiveness, costs, etc. In this study I examine the presence of the use of pharmaceutical cannabinoids among medicinal cannabis users living in Flanders. I expect a low occurrence since Sativex® is the only pharmaceutical cannabinoid medicine that is allowed in Belgium, and it came onto the market only very recently. In addition, MS patients are the only patients who receive reimbursement for the cost of Sativex®. Therefore, I also pay attention to participants' attitudes towards pharmaceutical cannabinoids.

It is important to examine why individuals prefer to use certain cannabis products and ingestion methods, since it gives scientists important knowledge in the development of new cannabinoid medicines. The reasons why people prefer herbal cannabis improve our understanding why people resort to the alternative and often illegal cannabis treatments. Exploring these preferences also allows us to identify which aspects of medical treatments are important and which are less important, something that cannot be measured in clinical trials.

The present study can be categorised under the type of studies in which respondents are recruited from the general population and label themselves 'medicinal cannabis users'. Surveys with medicinal cannabis users show that medicinal cannabis use takes place in many populations. Cannabis is used by men and women, young and old, high- and low-educated, for physical and mental health problems and in different areas all over the world. This means that the medicinal cannabis user population is not a homogenous group but a diverse population. However, certain features recur across multiple studies in which medicinal cannabis users show similarity. Cannabis is most commonly known to be used for its medicinal properties for the following indications, amongst others: arthritis, migraines, anxiety (disorders), sleep problems, depression, chronic pain, nausea, spasticity and stress (Walsh et al., 2013; Lintzeris et al., 2018; Swift et al., 2005; Lucas et al., 2019; Lanckenau et al., 2018).

This chapter suggests that the results of research that challenges the self-medicating hypothesis with regards to cannabis use are inconsistent. While some studies suggest that individuals dealing with psychological problems use cannabis to regulate distressful emotions, others do not find these motives for use. These latter studies suggest that the prevalence of cannabis use among these populations is higher, however cannabis is not always used to cope with psychological distress but also for other motives (e.g. social motives) (Buadze et al., 2010). In the current study I look at the prevalence and types of psychological disorders and symptoms among medicinal cannabis users. Next, I examine if cannabis is used as a coping mechanism for these psychological problems. In this way, I try to contribute to the existing theory regarding self-medication with cannabis.

In concluding, it may be wrong to rely solely on clinical trials to study medicinal cannabis use. The needs of medicinal cannabis users might differ from clinical indicators and should be further investigated in studies using surveys and interviews to collect data. Surveys with medicinal users show that they use cannabis for a more extensive set of conditions than those investigated in clinical trials. Individuals choose cannabis as a treatment for a wide variety of physical and psychological symptoms. Observational studies also show that medicinal cannabis users substitute their conventional medications and recreational substances with cannabis.

### **3. The position of cannabis in modern medicine**

#### *Introduction*

Patients who suffer from chronic, debilitating or terminal conditions turn more often to alternative treatments (Debas et al., 2006; Malassiotis et al., 2005). In recent years, there has been a general increase in the use of complementary and alternative treatments in Western societies (Salamonsen, et al., 2010; Coulter & Willis, 2004). Alternative treatments are often characterised by their holistic approach, meaning that there is a focus on body, mind and spirit (Barrett et al., 2003). Another important motivation for using alternative treatments is to lower the side effects caused by conventional medicines. Most people who use alternative treatments still undergo conventional treatments concurrently (Debas et al., 2006).

It is only very recently that Western medicine has embraced cannabis. In previous years, cannabis was relegated to alternative medicine and self-care. Due to the illegal status of cannabis and because cannabis enjoys little social acceptance, its use for health purposes differs remarkably from standard medical treatments in conventional medicine. In the first section of this chapter, cannabis and conventional treatments will be compared with regards to self-reported efficacy and side effects to illustrate why people opt for an alternative treatment that is often socially and legally unaccepted.

The ambiguous legal and social status of cannabis puts physicians in a difficult position regarding the supervision of medicinal cannabis use. The second section of this chapter discusses the findings of studies that explore the involvement of physicians in their patients' medicinal cannabis use and studies that examine health care professionals' attitudes towards medicinal cannabis use. It is important to look at the role of medical professionals in this literature review, because they are key actors in practice when it comes to the accessibility of cannabis, but also in socially constructing the meaning and image of medicinal cannabis use.

The use of medicinal plants is a growing trend. More and more people self-medicate with the plants, without knowledge of their physician (Clement et al., 2005). The final section of this chapter outlines the self-medicating practices of medicinal cannabis users and the accompanying challenges.

#### *3.1 Cannabis versus conventional medicines*

Medicinal cannabis users frequently compare cannabis to standard treatments, useful for their conditions, when motivating, defending, justifying or explaining their cannabis use (Pedersen & Sandberg, 2013; Pedersen, 2015; Dahl & Frank, 2011). They have often tried a variety of conventional and alternative treatments for the conditions for which they start using cannabis (Reinarman et al., 2011; Porter & Jacobson, 2013). Studies show that medicinal cannabis users are critical towards these standard

treatments and that they prefer cannabis above conventional prescription drugs for several reasons (Grella et al., 2014; Pedersen, 2015; Pedersen & Sandberg, 2013).

First of all, cannabis is chosen over approved medicines, when the latter are less or ineffective. Previous studies suggest that a large number of medicinal cannabis users think that cannabis is more effective compared to conventional medications (Ware et al., 2005; Coomber et al., 2003; Bortorf et al., 2009; Grotenhermen & Schnelle, 2003; Swift et al., 2005). A systematic review from 2008 shows that cannabinoid treatments can be more effective for the treatment of certain conditions compared to their standard treatments (e.g. anti-emetics for CINV) (Machado Rocha et al., 2008). Medicinal cannabis users' self-reports also suggest that cannabis has a broader impact on patients' quality of life than certain pharmaceutical drugs. For instance, medicinal cannabis users who participated in the study of Chapkis (2007) reported that cannabis offered more than only physical symptom relief and also targeted emotional difficulties. Cannabis enabled them to relax, be creative, be spiritual and it stimulated introspection and reflection. In 2011, Dahl & Frank (2011) conducted interviews with medicinal cannabis growers in Denmark. They found that medicinal cannabis users thought that cannabis influenced other important aspects of daily life positively in addition to the main symptoms for which they used cannabis (e.g. pain), which was not the case with conventional medication.

In addition to effectiveness, standard medications' undesirable side effects are also an important reason why patients switch from conventional medicines to cannabis. Research findings from previous surveys with medicinal cannabis users show that the vast majority think that the side effects of standard medications are more severe than those of cannabis (Ware et al., 2005; Coomber et al., 2003; Zaller et al., 2015; Grotenhermen & Schnelle, 2003; Bortorf et al., 2009). When the approved therapy of a patient generates more adverse effects than cannabis, the latter can be used as a substitute for the conventional treatment. Opioids, tricyclic antidepressants, drugs for spasticity and benzodiazepines are more often replaced with cannabis, because of their adverse effects (Grant et al., 2012; Collen, 2012). The negative effects of conventional therapies can be very unpleasant for patients. Moreover, some of the side effects are hazardous for one's health and unbearable for the patient. For instance, opioids reduce pain, but at the same time they can engender respiratory depression, sleep disturbance, cognitive and psychomotor impairment, nausea, constipation, sedation, vomiting, etc. (Benyamin et al., 2008).

One of the health risks associated with cannabis use is the risk of dependence and abuse. Particular pharmaceuticals (e.g. benzodiazepines and opioids) have a high abuse potential as well (Lessenger & Feinberg, 2008), however these are accepted for medical use. In previous studies, medicinal cannabis users have noted this high risk of dependence associated with particular conventional medicines, as the reason why they are opposed to these standard prescription drugs. They believed that cannabis helps to prevent abusing prescription drugs (Pedersen, 2015; Chapkis, 2007; Dahl & Frank, 2011). Cannabis is also perceived as a safer and superior remedy because it comes from natural sources and prescription drugs are considered inferior because they are 'toxic' and 'chemical' (Pedersen & Sandberg, 2013; Lau et al., 2015; Pedersen, 2015; Coomber et al., 2003; Dahl & Frank, 2011). This preference for 'natural'

products is also reflected in the preference for herbal cannabis over pharmaceutical cannabinoid medicines.

It is possible that for some patients' conditions nothing from the conventional pharmaceutical arsenal is effective (Cohen, 2010). Unfortunately, cannabis is not a magical solution for any disorder or disease, as it is proven not always to be the most successful remedy. For instance, research shows that cannabis can be more effective than older medications for the treatment of nausea, but not always compared to newer antiemetic pharmaceutical products (Kalant & Porath-Waller, 2016). Furthermore, research indicates that medicinal cannabis users themselves perceive cannabis to be helpful for certain symptoms (e.g. chronic pain), but less or ineffective for other health problems (e.g. acute pain) (Swift et al., 2005).

There is promising evidence that cannabis is therapeutically valuable, however this does not turn cannabis into a panacea. There are still a significant number of patients who combine cannabis with other medications, in order to maximise the therapeutic effects and to reduce the risks of adverse effects from both substances (Kalant & Porath-Waller, 2016; Ogborne et al., 2000; Hazekamp & Heerdink, 2013; Walsh et al., 2013; Nunberg et al., 2011; Aggarwal et al., 2009). The majority of medicinal cannabis users indicate needing additional treatments alongside cannabis (Zaller et al., 2015). Studies show that analgesics are the main medicines which are consumed alongside cannabis (Hazekamp & Heerdink, 2013; Aggarwal et al., 2009). Next, conventional antiemetics are often used concurrently with cannabis (Hazekamp & Heerdink, 2013).

Comedication of cannabis and other drugs is perceived not to cause any problems by medicinal cannabis users themselves (Coomber et al., 2003). There is preliminary scientific evidence for the fact that combining cannabis with opioids can produce beneficial outcomes for the patient because of synergetic effects (Pertwee, 2009; Abrams et al. 2011). Cannabinoid and opioid analgesic synergy has been demonstrated in preclinical studies (Cichewicz 2004; Kazantzis et al., 2016). This means that it might be beneficial for individuals who suffer from chronic pain to combine their opiate medication with cannabis, because of the augmented analgesic effects (Verbeke et al., 2005). Consequently, patients may be able to reduce their pain medication with adjuvant medicinal cannabis therapy. However, more high-quality research is needed in this area (Nielsen et al., 2017).

Finally, people choose an alternative or complementary treatment because they want to be more in control of their disease and want to manage their own care. They want to have responsibility over their health care within systems that often deprive individuals of control (Debas et al., 2006; Coomber et al., 2003). An alternative treatment is also chosen because of dissatisfaction with the health care system and conventional medicines in general (Salamonsen et al., 2010; Vickers et al., 2006). An example of this are patients who are in conflict with their physicians regarding the diagnosis or treatment for their conditions (Salamonsen et al., 2010). People who opt for alternative treatments are no longer passive recipients of and disempowered by the health care system, instead they are in an active position. They value the fact that their own efforts to cope with their conditions are more prominent (Salamonsen, et



al., 2010; Barrett et al., 2003). In the following sections I look at how medicinal cannabis users take care of their health outside of the conventional health care system.

People who start with a treatment, and in particular alternative therapies, often tend to adapt their view on health, illness and life. This study looks at medicinal cannabis users' attitudes towards conventional treatments and alternative therapies. A description of their own conventional and alternative treatments is given. Comparing cannabis with other treatments shows what makes cannabis unique as a treatment and why it is preferred. The underlying motives for opting for cannabis as a treatment will be subject to an in-depth examination. Intrapersonal and external factors are taken into account, including personality characteristics, social norms and values, social support and other healthcare treatment expenses. Individuals' experiences and attitudes towards medicinal cannabis use provide more information about the meaning that people ascribe to illness and medical treatments.

### *3.2 The involvement of medical professionals in medicinal cannabis users' healthcare*

Multiple studies have been performed which assess physicians' perceptions of medicinal cannabis use and how physicians handle the practical requests from their patients for medicinal cannabis. These studies yield mixed results. The majority of these studies were conducted in the US, Canada and Israel.

Charuvastra et al. (2005) conducted a survey among American physicians concerning their attitudes towards cannabis use. The results were remarkable as only one-third of the physicians thought that cannabis had valuable therapeutic effects versus two-third of the general population. Studies conducted in Canada and the US during recent years show that the majority of physicians do not recommend nor prescribe cannabis for their patients (Ziemianski, et al., 2015; Doblin & Kleiman, 1991; Fitzcharles et al., 2014; Kondrad & Reid, 2013). In Canada, cannabis is legal for both recreational and medicinal purposes. At the time of writing, 33 States in the US have state medical cannabis laws. However, cannabis remains illegal under the federal law. Therefore, physicians who practice in the US might be reluctant to prescribe an official recommendation because they fear federal sanctions (Gieringer, 2003).

Physicians have reported the lack of consistent scientific evidence concerning the benefits and risks of cannabis as one of the most important reasons to refrain from prescribing and recommending cannabis (Sullivan, 2012). Another possible obstacle for physicians to prescribe or recommend, are their concerns that patients masquerade their recreational use as medicinal use in order to obtain cannabis (Ziemianski, et al., 2015; Kondrad & Reid, 2013). Other contexts in which physicians do not recommend or prescribe cannabis is when their own knowledge about cannabis falls short, or when they lack confidence in their competence to adequately advise patients (Lucas, 2012; Gieringer, 2003; Ziemianski, et al., 2015; Fitzcharles et al., 2014; Mitchell et al., 2016; Braun et al., 2018). Physicians are often not confident with their competence regarding the dose, the frequency of use, the method of ingestion and the risks and benefits of cannabis (Fitzcharles et al., 2014; Ablin et al., 2016). The fact that very few physicians know about the existence and the functioning of the endogenic cannabinoid system in the human body

## PART I Literature review

(Hazekamp & Pappas, 2014; Fitzcharles et al., 2014), demonstrates this shortcoming in knowledge concerning medicinal cannabis use. The study of Pedersen and Sandberg (2013) showed that this lack of knowledge among physicians is resented by patients in Norway.

The knowledge gap among physicians regarding the medicinal use of cannabis can be explained. Currently, there is still insufficient medical education and information provided to medical professionals. Even in countries where medicinal cannabis use has been approved for many years (e.g. Canada), the training and education for physicians is still lacking (Leung, 2011; Walsh et al., 2013; Ziemianski, et al., 2015). Recent studies performed in Canada, the US and Israel surveyed physicians concerning medicinal cannabis use. These surveys show that over 80% of the physicians think that there should be more education and training for physicians. The physicians wish that there was more information available on the risks, benefits and therapeutic indications of cannabis, and they call for official clinical guidelines (Ebert et al., 2015; Walsh et al., 2013; Kondrad & Reid, 2013). In 2004, Nolf conducted a survey among Belgian physicians to assess their knowledge and attitudes regarding medicinal cannabis use. This study pointed out that 95% of the participating physicians rarely or never received information regarding medicinal cannabis through official educational institutions, medical commissions or colleagues. The most important sources of information were the media and trade journals. Only 12.9% had extensive knowledge about the medicinal use of cannabis. Out of all the participating physicians (n=62) only one had previously prescribed cannabis (Nolf, 2004).

Currently, no detailed guidelines exist on how physicians should prescribe botanical cannabinoid medicines (Kahan et al., 2014). There is no comprehensive information available which physicians can rely on that describes how patients should consume cannabis when suffering from a particular condition (MacCallum & Russo, 2018). Physicians who recommend cannabis are often very careful with their diagnoses and the associated recommendations (Hazekamp & Pappas, 2014). The inadequate dissemination of information on medicinal cannabis is likely due to the absence of conclusive scientific research results, inconsistent research findings, the ambiguous legal status of cannabis, inconsistent regulations and the sensitiveness of the subject.

In contrast with the some of the research findings mentioned above, studies conducted in Israel and the Netherlands show that the majority of the participating physicians approve the use of cannabis as a therapeutic agent and are willing to prescribe cannabis for certain conditions (Ebert et al., 2015; Clark et al., 2011). Both the Netherlands and Israel have a national medical cannabis program. In the Netherlands, where herbal cannabis products have been approved for medical use for over ten years, 60% to 70% of the medical practitioners considered medicinal cannabis sufficiently socially accepted and would prescribe it if a patient requested it (Clark et al., 2011). An international poll, conducted on the website of the New England Journal of Medicine in 2013 among 1446 clinicians, revealed that the majority supports medicinal cannabis use (Adler & Colbert, 2013). Research performed by the International Association for Cannabis as Medicine (IACM) shows that in almost half of the cases where individuals use medicinal cannabis their physician was involved. This was an international study

conducted in 31 countries, hence the results will likely vary between countries according to the legal status of cannabis (Hazekamp et al., 2013).

Research has been performed to explore the attitudes of medical specialists, such as oncologists, rheumatologists and psychiatrists, about medicinal cannabis use, since there is an increased likelihood that their patients will use cannabis for medical purposes compared to the general population. Doblin and Kleiman found in the early nineties that 44% of oncologists in the US recommended cannabis to at least one cancer patient and almost half (48%) of oncologists would prescribe cannabis if it was legal (Doblin & Kleiman, 1991). These results are from an older study but they are consistent with the findings from a study conducted in 2018, in which almost half of the oncologists who practice in the US have recommended cannabis clinically (Braun et al., 2018). In 2014, rheumatologists working in the US were surveyed with regards to medicinal cannabis use. Of the 128 rheumatologists, 70% had never recommended any cannabinoid treatment and almost half thought there was currently no role for cannabinoids in the treatment of rheumatic diseases. The lack of confidence rheumatologists had in their knowledge and the dearth of definitive scientific evidence, were the main reasons they would not recommend cannabis (Fitzcharles et al., 2014).

In addition to the higher rates of cannabis use among cancer patients and patients living with arthritis, there is also a higher prevalence of cannabis use among people who suffer from mental health problems. Psychiatrists who practice in the US are divided on whether and how cannabis should be used in clinical practice (Kweskin, 2013). Finally, the majority of hospice care professionals working in the US are in favour of the legalisation of cannabis and think cannabis has medical benefits. They believe that physicians should be allowed to prescribe cannabis when legalised (Uritsky et al., 2011). These differences in attitudes among medical specialists is likely due to different legal contexts, differences in practice experiences, and the type of diseases and conditions for which cannabis is used as a treatment.

The studies discussed above focus on physicians' perspectives and attitudes with regards to medicinal cannabis use. The following paragraphs will focus in on the findings of studies that examine medicinal cannabis patients' experiences and perspectives regarding the role of their physicians.

It is common for patients not to inform their general practitioners about the use of herbal medicines (Vickers et al., 2006). Hakkarainen et al. conducted an international survey in 2015 with cannabis growers in six different countries. The majority of the growers who cultivated cannabis for medical purposes did not discuss their cannabis use with their physicians. Ziemianski, et al. (2015) argue that the lack of patients informing their physicians is probably the result of the stigma that is attached to cannabis as a recreational drug. This stigma can have a negative influence on the relationship between cannabis users and their physicians (Ziemianski, et al., 2015; Bottorf et al., 2013). Some individuals appear to be afraid of being discriminated against because of their cannabis use (Belle-Isle et al., 2014). MS patients who participated in the study of Page & Verhoef (2006) reported that they did not disclose their cannabis use when they expected physicians to react negatively. Medicinal cannabis users also do not bring up their cannabis use in their conversations with their physicians when they believe it is irrelevant (Coomber et al., 2003).

Patients who are open about their use towards physicians try to discuss and negotiate about their use. According to medicinal cannabis users who participated in the studies of Pedersen & Sandberg (2013) and Coomber et al. (2003), physicians' responses were ambivalent. Some physicians do not want to hear about their patients cannabis use and avoid the subject. In the study of Pedersen & Sandberg conducted in Norway, self-labelled medicinal cannabis users claimed that most physicians are sceptical. The participants believed that physicians can be supportive and understanding, but nothing more. They argued that they never ask for actual help from physicians, because they will 'turn off' (Pedersen & Sandberg, 2013). In addition, some physicians tell their patients that the use of cannabis should be avoided (Hakkarainen et al., 2015). Despite this negative advice, patients appear to continue to use cannabis for medicinal purposes.

When physicians refuse to prescribe cannabis or do not support their patient's cannabis use, this could undermine the established doctor-patient relationship. The study of Belle-Isle et al. (2014) indicates that medicinal cannabis users are concerned this would happen when they disclose their medicinal cannabis use. Some patients who believe that their relationship with their physician could be compromised, look for other physicians willing to prescribe cannabis instead of their regular physicians (Satterlund et al., 2015). In a national survey conducted in Canada, almost one third of the people using cannabis for health purposes went to a new physician to discuss medicinal cannabis use (Belle-Isle et al., 2014). In the US, recommendations for medical cannabis are more often acquired from physicians specialised in medical cannabis use (Lankenau et al., 2018a). This may have negative treatment outcomes since the personal doctor normally has the most knowledge about his or her patient and his or her conditions (Satterlund et al., 2015). Taking patients' perspectives into account influences adherence to medical treatment and therefore has an important impact on the overall health outcome (Buadze et al., 2010). For instance, if physicians are not aware of the cannabis use of their patients, the latter might feel stigmatised, which can be detrimental for the physician-patient relationship.

Other studies show that the majority of medicinal cannabis users have talked about their use with a clinician (Belle-Isle et al., 2014), who was understanding and gave positive feedback. Only a minority were discouraged by their physician (Swift et al., 2005; Ogborne et al., 2000; Page & Verhoef, 2006; Belle-Isle & Hathaway, 2007; Coomber et al., 2003). In a more recent study from 2018 conducted in Australia, almost two in three of self-identified medicinal cannabis users discussed medicinal cannabis use with a health care provider (Lintzeris et al., 2018).

The diverging results regarding the acceptance and support by physicians are likely the result of the different social and legal contexts in which the studies were conducted. Another explanation for the differences in physicians' attitudes might be due to the types of conditions and diseases for which patients use cannabis. For particular diseases (e.g. HIV) the use of cannabis is regarded to have therapeutic value, while other diseases are not or recognised, or recognised to a lesser extent. In the study of Belle-Isle et al. (2014) patients with HIV/AIDS reported less obstacles in obtaining cannabis from the governmental program in Canada for which they need approval from their physician. They also

seem to discuss medicinal cannabis use more often with their physician compared to people suffering from depression and anxiety.

### *3.3 Self-medication with cannabis*

When medical cannabis products have an illegal status, medicinal cannabis users are left to their own devices. Despite the large amount of information available on the internet regarding cannabinoid products, routes of administration, therapeutic benefits, side effects and so on, this information can be found unreliable, overwhelming, and too vague to apply it to one's personal situation. Due to the prohibitive regulations, individuals who do not have the knowledge of medical professionals are forced to self-medicate with cannabis.

Previous studies illustrate that self-identified medicinal cannabis users learn more about medicinal cannabis use from multiple sources, including other users, independent research, self-exploration, cannabis dispensary staff and the internet, but seldom from health-care professionals (Athey et al., 2017, Lankenau et al., 2018a). Research shows that medicinal cannabis users living in California (US) search for more personal information about medicinal cannabis in cannabis dispensaries. The researchers argue that one reason might be the oversaturation of information on the internet (Janichek & Reiman, 2012). It seems that the internet is currently an important informal source of knowledge on cannabis and its therapeutic properties. The reliability of this information is often disputable though (Shi et al., 2019). Therefore, it might pose health risks for vulnerable populations to rely on the internet as their virtual physician.

Patients always have the possibility to ask their physicians for advice on medicinal cannabis use. However, when cannabis has an illegal status they still have to experiment with the available illicitly sourced cannabis products. Physicians may simply refuse to discuss the use of cannabis as a treatment, as this even happens in countries where medicinal cannabis use is legal (Bottorf et al., 2013; Belle-Isle et al., 2014). Furthermore, it is likely there will be patients who will come to the conclusion that their own knowledge exceeds the knowledge of their physician regarding medicinal cannabis use patterns. Physicians more often provide only general and insufficient information (Athey et al., 2017). In this way, there is a role reversal as the patient becomes the expert instead of the physician. The patient will determine the appropriate dose, frequency of use and ingestion method (Bostwick, 2012), turning the physician-patient relationship upside down.

Research revealed that in countries where cannabis for medicinal purposes is legalised there is a large discrepancy in the prevalence of self-reported use and authorised medicinal cannabis use (Belle-Isle et al., 2014). This means that even in countries with legal sources of cannabis, and where physicians are responsible for authorizing cannabis, there is still insufficient involvement of health care professionals.

When cannabis and cannabinoid medicines are approved, patients can be supervised in their treatment by physicians. However, research indicates that even in countries where medicinal cannabis use is legal

(e.g. Canada), the reality is somehow different (Belle-Isle et al., 2014). Studies conducted in these countries show that a significant number of physicians admit that they lack knowledge and are unconfident about their competence in supervising medicinal cannabis use. Consequently, they decide to refuse the request of their patients regarding medicinal cannabis use (Jones & Hathaway, 2008; Lucas, 2012; Gieringer, 2003; Ziemianski, et al., 2015; Fitzcharles et al., 2014; Mitchell et al., 2016; Braun et al., 2018). In addition, some medical professionals may be unwilling to prescribe cannabis, because they have no faith in the therapeutic properties of cannabis (Fitzcharles et al., 2014). In the Netherlands, where medical grade herbal cannabis can be obtained with a prescription in pharmacies, it seems that most patients have only used one variety of cannabis while pharmacies offer multiple types of strains. This may partly be due to insufficient information provided by doctors or the doctor may have refused to prescribe different cannabis varieties (Hazekamp & Heerdink, 2013).

Most medicinal cannabis users are under standard medical treatments as well, in which their conditions are monitored by physicians (Hazekamp et al., 2013). The responsible clinicians decide on the necessary medical interventions and will inform the patient about the reasons why he or she needs those treatments. Furthermore, the physician will explain how the medicines need to be taken (e.g. dose, method of ingestion, etc.) and what precautions have to be taken by the patient (e.g. co-medication, driving, etc.). This is in contrast with the same patients' practices of self-medication with cannabis. Most medicinal cannabis users have to experiment with the dose, the method of ingestion, the type of cannabis product, the frequency of ingestion, etc., without having the expertise of a doctor (Athey et al., 2017). In the study of Belle-Isle et al., (2014) among medicinal cannabis users living in Canada, half of the respondents who talked about their medicinal cannabis use with their physician were less satisfied about these talks compared to their conversations regarding other medical matters.

The examples above indicate that for most medicinal cannabis users self-medication is a necessity and not a choice. However, it does not necessarily have to be experienced as a forced option. Some people may choose deliberately to self-medicate with cannabis, as they want to be actively involved in the management of their disease or condition (Coomber et al., 2003). In the study of Pedersen (2015) prescription drugs were perceived by self-defined medicinal cannabis users as pushed upon them, while cannabis was conceived in a framework of freedom and autonomy. Since cannabis has been prohibited for many years, individuals may have developed self-medication practices to that extent that pharmaceutical products may not be able to compete with them (Waldstein, 2010).

Self-medication might lead to the empowerment of the patient and the reduction of the power of the medical professional (Blenkinsopp & Bradley, 1996). Self-determination in medical terms is the respect for the autonomy of an individual and the right of a patient to decide which treatment is the most effective and least harmful for him or her (Reiman, 2009). The question is if this currently applies to (illegal) contested treatments like medicinal cannabis use. Some medicinal users claim it is their right to choose their medical treatment and they are no longer willing to wait for the legalisation of cannabis or other legal alternatives. Especially terminal and severely ill patients seem to be less concerned about their illegal self-medicating practices (Page & Verhoef, 2006).

Self-medication with cannabis is not without risks. When a physician is not aware of the use of cannabis by his or her patient, there is a possibility that he or she will wrongly attribute certain developments or responses to the conventional treatments. In addition, there is the risk of interaction between the patient's conventional medication and cannabis (Debas et al., 2006). In addition, there are a broad variety of cannabis products available which vary in chemical content. Not only are there numerous types of cannabis strains, there are also a large assortment of cannabis extracts (e.g. cannabis oils), cannabis-infused products (e.g. edibles) and different types of methods of ingestion (e.g. dabbing). This can be an advantage for patients because this way they are able to select an adaptive personalised treatment. However, one can also get lost in this enormous offer. Without proper information and guidance from medical professionals, this search can have negative outcomes for individuals when selecting a less effective cannabinoid product, method of ingestion, dosage or frequency of use, suitable for their conditions. This way, medicinal cannabis users are forced to experiment in order to find a beneficial treatment. In addition, the oversupply of medical information offered online may contribute to the expansion of medicalisation as some people may start using medicinal cannabis when it is unnecessary.

When guidance is lacking for patients to make an informed and well-advised safe decision, they could end up with a therapy that is suboptimal or even harmful for their health. Self-medication can be ineffective or even dangerous when people are using the medicine incorrectly. Cases are known in which people self-medicate with cannabis in problematic ways. To give an example, Bakalar & Grinspoon (1997) argue that oral ingestion of cannabis generates unpredictable effects and users are often afraid to consume an overdose. As a consequence it is more likely that those people are under-medicated instead of overmedicated. In this way, they might still experience symptoms which would not have occurred if they had been adequately informed.

## *Conclusions*

The present study aims to identify the reasons why individuals opt for cannabis as a treatment, by making a comparison with conventional treatments regarding adverse effects, effectiveness, routes of administration, availability, accessibility and legal and social status. It focusses in on the type of conventional treatments used by medicinal cannabis users in conjunction with cannabis, and participants' motivations for using standard treatments. Particular attention is paid to the use of cannabis as a substitute for conventional prescription drugs.

This chapter shows that self-medication with cannabis is for most patients currently a forced option, especially in countries where cannabis use for medicinal purposes is not allowed. The present study will inquire to what extent medicinal cannabis users self-medicate with cannabis and from which type of information sources guidance about medicinal cannabis use is obtained. It examines how medicinal users manage themselves within the broad variety of cannabis products and consuming methods. The current

study seeks to elucidate if self-identified medicinal cannabis users experience self-medication as a forced option or if they are empowered by using an alternative treatment.

Inversely related to individuals' self-medicating practices is the involvement of physicians. Medical professionals are the most important gatekeepers for legally available medicines due to their exclusive right to prescribe them. They have a central role in managing illnesses and monitoring patients. In the current chapter it became clear that physicians do not always take this role upon themselves when cannabis is the medical treatment. The present study focusses on medicinal cannabis users' interactions with medical professionals regarding medicinal cannabis use, from the point of view of the user. Specific attention will be paid to physicians' awareness of their patients' cannabis use and if the subject was openly discussed. This way, we can generate a first insight into Belgian physicians' responses and attitudes towards medicinal cannabis use. One important aspect to focus on is physicians' support for the use of cannabis. A patient might face rejection when disclosing his or her use, which can negatively affect the physician-patient relationship.



## General conclusions

The purpose of this literature review was to provide an overview of the current state of knowledge about the therapeutic potential of cannabis, the profiles of medicinal cannabis users and the position of cannabis in conventional medicine.

Cannabis has been used as a therapeutic agent since ancient times. The isolation and synthesis of the cannabinoids THC and CBD in the late twentieth century led to an increase in scientific studies into the therapeutic utility of cannabinoids. Since then, there has been an ongoing effort to better understand the pharmacological properties of cannabis and its interactions with the human body. These studies suggest that the components of cannabis have distinct pharmacological properties and bind with receptors located throughout the human brain and body. The versatility and biochemical complexity of cannabis turns the substance and its compounds into promising therapeutic agents for different types of conditions (Andre et al., 2016; Russo & Marcu, 2017; Whiting et al., 2015). Today, the fact that cannabinoids improve nausea and vomiting due to chemotherapy, spasticity due to MS and neuropathic pain receives the most scientific support (Allan et al., 2018). The medical use of cannabis and cannabinoids is a fast-growing area of research. Future studies will help to fill in current knowledge gaps regarding the effectiveness and safety of cannabinoid treatments.

Throughout history the main method for ingesting cannabis was by smoking raw cannabis flowers. Cannabis use patterns are evolving, looking at the growing number of different types of cannabis products (e.g. pharmaceutical cannabinoid medicines) and advanced ingestion methods (e.g. sublingual administration). Furthermore, potency levels of illegally sourced cannabis have increased significantly over the years, and cannabis extracts can be highly concentrated. Standardisation, label accuracy and quality control is still lacking for most currently available cannabis products. Due to these new ingestion methods and forms of cannabis, and due to the variability and unreliable quality of most cannabis products, it is important to remain careful with statements about the effectiveness and safety of 'cannabis'. When claiming cannabis' effectiveness and safety in certain conditions, it is important to specify the type of cannabinoid product and ingestion method for which these claims hold true.

This literature review shows that cannabis is still poorly integrated in conventional health care and that the involvement of physicians is limited. Physicians are reluctant to prescribe cannabis because of legal restrictions and the lack of education, sound scientific evidence and prescribing guidelines. As a result, patients turn to informal information sources and self-medicate with cannabis, which might pose health risks. Cannabis policies that are moving towards less restrictive regimes, together with the growing body of scientific evidence on cannabinoid treatments, will probably lead to the acceptance and the integration of cannabinoid treatments in conventional health care.

The fact that cannabinoid treatments have been used for centuries, but were only recently recognised in modern medicine, means that there might be a lot to learn from the experiences of medicinal cannabis users themselves. This literature review discusses the profiles, use patterns and use motives of medicinal

## PART I Literature review

cannabis users. It shows that inhalation is the most commonly method for consuming cannabis among medicinal cannabis users. Up until today, pharmaceutical cannabinoid products remain less popular. However, new cannabis products are transforming the medicinal cannabis market. Previous studies suggest that cannabis products are used as a treatment for various physical and mental health purposes. In addition, cannabis is used as a substitute for conventional medicines, because it is perceived as more effective and/or causing less severe side effects.

## Part II

### Conceptual framework

#### Introduction

Regulating psychoactive substances presents a challenging public health issue. Cannabis is more than a medicinal plant with therapeutic properties, it is also a psychoactive ‘drug’ used for recreational purposes. For this reason its use is in certain contexts acknowledged and defined as medicinal, while in other contexts its use is considered to be non-medical. This chapter focusses on this issue by demonstrating that the concept of ‘medicinal cannabis use’ is not easily defined. It looks into possible explanations for this difficulty and its consequences for the many actors involved.

Cannabis is a psychoactive substance and because of its pleasurable properties it has potential for abuse. In addition, the psychedelic effects of cannabis can be experienced as bothersome by patients using it for medical reasons. On the one hand, cannabis can be a beneficial therapeutic agent, at the same time it is also a potential harmful substance. As a result, cannabis use is a delicate issue in medicine, which is no different from other psychoactive medications. In this chapter I address the controversial psychoactive effects of cannabis in the context of medicinal cannabis use. Medicinal cannabis users’ own attitudes towards the cannabis ‘high’ will be discussed.

Throughout recent years, cannabis was mainly used for recreational purposes because of its psychoactive properties. In the current conceptual chapter I reflect on the consequences for medicinal cannabis use(rs) of the fact that cannabis, in addition to being a therapeutic agent, is also a stigmatised illicit psychoactive drug used for recreational purposes. I focus in on the blurred lines between recreational and medicinal use by comparing the profiles of medicinal and recreational cannabis users, and by discussing their use patterns and motives for use. The chapter focusses then on the stigma medicinal cannabis users may experience and how they respond to it. Specific attention is paid to behavioural and cognitive coping strategies for stigma.

The chapter starts by giving a more elaborate view on the different theoretical approaches on which the study builds.

#### 1. Theoretical frameworks on which this thesis was built

The current study integrates multiple theoretical approaches under a theoretical umbrella. Sociological theories of drug use are central. These theories, looking at drugs from a sociological perspective, acknowledge that drug experiences are variable and socially constructed (Becker, 1973; Zinberg, 1984). The starting point of this thesis is that prevailing discourses and perceptions on psychoactive substances,

## PART II Conceptual framework

the social and legal responses to the use of psychoactive substances, and our attitudes towards users of psychoactive substances, are all social constructs.

In order to understand drug experiences, sociological approaches take into account the way the drug is used, and the social and cultural context in which the drug is experienced and understood. Famous in the sociological theoretical literature on drug use is the influential work of Norman Zinberg (1984) and Howard Becker (1953; 1973). Zinberg, an internationally leading expert on the use of psychoactive substances, argues that drug experiences are based on three interacting determinants: ‘the drug (the pharmacological action of the substance itself), the set (the attitude of the person at the time of use, including his personality structure), and the setting (the influence of the physical and social setting within which the use occurs)’ (Zinberg, 1984, p.5). Zinberg asserts that it is wrong to assume that a drug has the same effect on different individuals and that the effect stays constant over time on the same person. Becker, in turn, argues that drug experiences have to be learned and that the categories main effects and side effects are socially constructed (Becker, 1953; 1973; Pedersen & Sandberg, 2013). Consequently, the examination of medicinal cannabis use should go further than merely measuring pharmacological properties. It is important to comprehend users’ narratives and discourses, as well as the numerous social factors that influence the perceptions of cannabis (Cohen et al., 2001).

Sociological theories move beyond pharmacological and biomedical approaches in which effects and experiences produced by a drug are considered the consequence of the chemical and pharmacological properties of the drug, and the physiological and psychological processes it induces in the human body, independent from the user’s set and the setting in which the drug is consumed (Holt & Treloar, 2008). Early critics have referred to this more narrow approach as ‘chemicalistic fallacy’ (Goode, 1972), ‘pharmacological fallacy’ (Adler, 1972) (Schwartzman, 1988) and ‘pharmaceutical determinism’ (Anderson, 2017). Generally absent in biomedical discourses is the acknowledgement of the importance of the cultural and social context in which a drug is consumed. Apart from a few exceptions (e.g. Pedersen, 2015; Winkelman, 2007; Keane, 2008; Pedersen & Sandberg, 2013; Chapkis, 2007; Dahl & Frank, 2011) sociological theories are rarely used to frame and examine drug effects and experiences when psychoactive medicines or prescription drugs are used for health purposes. Instead, these studies that integrate sociological approaches focus mainly on the abuse of pharmaceutical drugs, such as drug dependence. From a sociological perspective, the current study looks into the experiences and attitudes of self-identified medicinal cannabis users and the concept of ‘medicinal cannabis use’, taking into account the consumed cannabis product, the set of the user and the setting in which the substance is consumed.

The concepts of ‘drugs’ and ‘medicines’ are neither neutral nor objective categorisations. The dichotomy of illicit drugs and legitimate medicines is socially constructed and is the result of legislative frameworks, professional practice and commercial interests (Dertadian, 2018; Walker, 2017). The category to which a particular substance belongs depends on social, legal and cultural factors. For instance, cocaine and amphetamines are pharmacologically similar to Ritalin®, however the first two substances are stigmatised illicit stimulants, while the latter is an approved medicine to treat ADHD

(Keane, 2008). While certain psychoactive drugs are forbidden and subject to criminal law, other psychoactive drugs are promoted in commercial and medical spheres (Walker, 2017). Social and cultural influences are not insignificant, since psychoactive substances are ‘medicines’ in one country and ‘drugs’ in others. This is currently also the case for particular cannabinoid products. The legal status is often what differentiates medicines from drugs (Cohen et al., 2001). Cannabis has crossed the traditional conceptual boundaries ‘illicit/licit’, ‘moral/immoral’ and ‘medicinal/non-medical’ multiple times, depending on the context of consumption (Cohen et al., 2001; Wadley, 2016; Dertadian, 2018).

Tupper (2012, p. 472) argues that the concept “medicine is a social construction that reflects the power dynamics of a particular time and place”. This also accounts for cannabis when looking back on its periods of legalisation and of prohibition. Before international drug treaties arose around the 1960s, cannabis was an accepted medical treatment in several regions around the world. Due to mainly social, political and societal changes, cannabis was no longer (perceived as) a herbal ‘cure’ but considered a denounced ‘drug’. Cohen et al. (2001, p. 442) argue that “medications themselves are much more than material objects with physiological effects; they are also representations that carry meanings and shape social relations as they evolve in conjunction with individuals and collectivities”. Cannabis is a social phenomenon embedded in individual and collective meanings (Cohen et al., 2001).

In addition to the legal status of a substance, the way it is consumed is another means of categorising substance use, and determines how society responds to it. The use of psychoactive drugs can be categorised into multiple typologies. An example of such a typology is given by Erich Goode (1972), a highly respected sociologist, who lists four types of drug use.

1. Legal instrumental use - Taking prescribed drugs and over the counter drugs to relieve or treat mental and physical symptoms.
2. Legal recreational use - Using licit drugs (tobacco, alcohol, caffeine) to achieve a certain mental state.
3. Illegal instrumental use - Taking non-prescription drugs, such as antidepressants and stimulants, to accomplish a task or goal. For example taking amphetamines without a prescription to study for an exam.
4. Illegal recreational use - Taking illegal drugs for fun or pleasure, to experience euphoria and intoxicating effects, such as heroin.

Depending on the time frame and the legal context, the use of cannabis can be located in all four categories. The current study does not focus on societal, social and regulatory interactions on the meso- and macro level contributing to the social construction of ‘medicinal cannabis use’, but starts from the user perspective. Drawing on the work of the social drug researchers discussed here, I explore the constructed meanings of self-identified ‘medicinal cannabis use’ from a constructivist perspective. This means that knowledge will be gathered on ‘why’ and ‘how’ cannabis is used for medicinal purposes and by ‘whom’. This thesis will provide an in-depth description of self-described medicinal cannabis users’ experiences with medicinal and recreational cannabis use and their attitudes towards it. It looks into the

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way people define and experience the use of cannabis as a therapeutic agent and how this differs from recreational use.

The work of Lamont and Molnar (2002), Copes (2016) and Pedersen & Sandberg (2013) on symbolic boundary work provides a useful theoretical framework to examine the conceptual distinctions made by medicinal cannabis users themselves so as to make sense of and categorise ‘medicinal cannabis use’. Symbolic boundaries are “conceptual distinctions made by social actors to categorise objects, people, practices and even time and space” (Lamont and Molnar, 2002, p. 168). In the case of medicinal cannabis use, symbolic boundaries utilised for **objects** are the lines drawn between cannabis and other psychoactive substances, including conventional medicines and psychoactive substances used for recreational purposes.

Symbolic boundary work also refers to “the process by which individuals define their identity in opposition to that of others by drawing symbolic boundaries” (Lamont, 1992, p. 233). Using a narrative approach Copes (2016) and Järvinen & Demant (2011) add to the theory on symbolic boundary work among drug users. They add an important concept: social identity construction. People’s narratives produce personal identities by telling stories that reflect essential differences between themselves and symbolic others (Copes, 2016). Symbolic boundaries “create positive perceptions of self” (Copes, 2016, p. 207). These narratives are influenced by prevailing discourses on the meso- and macro levels. The analysis in the present study illustrates that medicinal cannabis users delineate their **identities** from those of drug users using illicit drugs for recreational purposes, and in particular from those of recreational cannabis users.

Distinct **motives** for using drugs are also used as a symbolic separation. Previous research suggests that young people draw symbolic boundaries between experimentation with cannabis (accepted) and regular use of cannabis (unaccepted) in the normalisation of cannabis (Järvinen & Demant, 2011). My analyses show that for medicinal cannabis users the distinction between the use of cannabis motivated by relieving pain –all types of suffering- (accepted) and hedonistic pleasure (unaccepted) appeared to be an important and meaningful symbolic boundary (cf. Pedersen & Sandberg, 2013). Maximising health by achieving a normal state of being through the use of substances seems to be proper, whereas hedonistic purposes are deemed improper. By a ‘normal state of being’ I mean the pursuit of a healthy, harmonious and stable state, whereas hedonism involves the pursuit to maximise pleasure and euphoria. Hedonistic pursuit of drug pleasure is known to be stigmatised. While bodily pleasures and the avoidance of pain are morally accepted therapeutic uses according to the self-described medicinal cannabis users in this study, this appears to be somehow different from desiring psychological pleasures (e.g. euphoria and enhancement). Pleasure has been defined as the relief of pain and described as the opposite of pain. Pain and pleasure are generally considered as two opposites, both situated at the ends of a spectrum. While pain relief and experiencing pleasure are considered incompatible, Dertadian (2018) argues that the two are not mutually exclusive and more often not that different.

The dividing lines delineated by medicinal cannabis users themselves between pleasure and symptom relief, recreational and medicinal use(rs), and cannabis and other substances, teach us more about medicinal cannabis users' definitions and understanding of medicinal cannabis use.

## 2. What is medicinal cannabis use? The difficulty of defining the concept of 'medical'

### 2.1 Unclear distinctions between medicinal and recreational cannabis use?

“Just because something makes you feel better, doesn't make it medicine”- Andrea Barthwell, US deputy “drug czar” (Chapkis & Webb, 2008, p.71).

“All marijuana use is medicinal” – Dennis Peron, co-author California Proposition 215<sup>11</sup> (Heilig, 2016).

These two statements both address medicinal cannabis use, but the underlying assumptions about the meaning of 'medical' differ. Although opinions on health and treatments, including the medical use of psychoactive substances, diverge, the concepts of 'medicinal' and 'recreational' cannabis use are commonly and unquestioningly used in public discourse and research. Cannabis is used by people suffering from various conditions and to alleviate diverse health problems. Some of these conditions and symptoms may not be considered to be real 'medical' indications. Consequently, an important question that arises is '*when do we speak of medicinal cannabis use?*'

Multiple scholars report that the boundaries between recreational and medicinal cannabis use are blurred (Lankenau et al., 2018; Reinerman et al., 2011; Pedersen, 2015; Athey et al., 2018; Newhart, 2013; Bawin, 2019; Bakalar & Grinspoon, 1997; Grinspoon, 2010). While patterns of use, motives for use, and experienced effects of medicinal and recreational use may differ in certain respects, more often there is also a significant overlap. Reinerman et al. (2011), suggest that the terms 'medical' and 'nonmedical' should not be viewed and employed as exclusive terms, but as a continuum. In the study of Dahl & Frank (2011) Danish medicinal cannabis users described medicinal use as a sliding scale from recreational use. The authors acknowledge that it can be difficult to “draw a definite line between therapeutic and recreational use” (p. 67). In the study of Piper et al. (2017) American medicinal cannabis patients were asked to describe their cannabis use going from '100% medical/0% recreational' to '100% recreational/0% medical'. They found a mean of 84.7% medical (or 15.3% recreational).

Concepts have been developed to fill in this grey area between medical and recreational use, such as 'instrumental', 'therapeutic', 'semi-medicinal' and 'quasi-medical use' (Bardhi et al., 2007; Bakalar & Grinspoon, 1997; Fischer et al., 2015; Bottorf et al., 2009). First, the term 'instrumental' is applied to

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<sup>11</sup> California Proposition 215 is a law in California (US) allowing medicinal cannabis use.

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the behaviour of people who use drugs for the pharmacological effects they produce, but not for recreational or pleasure purposes (Bottorf et al., 2009). Second, other scientists consider certain purposes for use, such the relief of anxiety and stress, as ‘quasi-medical’ reasons (Bardhi et al., 2007). Bakalar & Grinspoon (1997) speak of ‘semi-medicinal use’ when cannabis is used to enhance creativity and productivity. Grinspoon argues that medical and non-medical use are related: “It enhances many pleasures and has many potential medical uses, but even these two categories are not the only relevant ones. The kind of therapy often used to ease everyday discomforts does not fit any such scheme” (p. 13, Grinspoon, 2010).

The unclear boundaries between therapeutic and recreational use of cannabis are apparent in multiple ways. By emphasising the recreational and hedonistic characteristics of cannabis in recent decades, the view of cannabis as a medicine has disappeared from human memory in contemporary societies (Nolf, 2004). As a result, the therapeutic use of cannabis was questioned and had a rather shifty image among the general population over recent years. The confusion between medicinal and recreational use is strengthened by the fact that the typical symbols from the cannabis culture are incorporated in the medicinal cannabis industry (Pedersen & Sandberg, 2013). It is assumed that the link between medicinal cannabis and recreational use impedes the substance from being regarded as a fully-fledged medicine among the general population as well as among scientists and medical professionals. Although prescription drugs are also misused and not always used as therapeutic agents, their contexts differ strongly from the context of cannabis. Most prescription drugs do not have the history and wide prevalence of recreational use, and thus there is less confusion (Pedersen & Sandberg, 2013).

Still, the blurred boundaries between recreational and medical use are not unique to cannabis. The distinction between medical and recreational drugs use is socially constructed (Walker, 2017). The medical and recreational use of psychoactive substances has often been intertwined (Wadley, 2016; Dertadian, 2018). For instance, research has paid attention to the fine line between healing and enhancing the mind when using psychotropic drugs (Pieters & Snelders, 2009), and to the blurred distinctions between therapeutic and recreational use of painkillers (Dertadian, 2018).

There are many conceivable situations in which prescription drugs are used for ‘less severe’ or non-medical indications. When one has a headache and responds to it by taking an aspirin, very few will question its medical purpose. This is slightly different for psychological indications and psychoactive medicines. For instance, antidepressants, such as benzodiazepines, are prescribed for people to make them feel better, but who do not meet the criteria for clinical depression (Reinarman et al., 2011). Some people may use tranquilisers to cope with emotional distress in a wide range of daily contexts, e.g. going through surgery, grieving for someone’s loss, etc. Other people may take tranquilisers just to get through the day. Over the counter drugs are also being used for instrumental purposes, for instance to increase productivity at work (Franke et al., 2013). Some of these examples include maybe less severe indications, but for which individuals do reach for medication. In addition, studies show that prescription drugs are also being ‘misused’, for instance the use of pain killers for recreational purposes (Dertadian, 2018) and the injection of oral drugs (McCabe et al., 2009).



An important reason why defining ‘medicinal cannabis use’ can be difficult, results partially from the fact that the motives for recreational and medicinal use can be very close at times and even intertwined. Athey et al., who conducted interviews among self-identified medicinal cannabis users in Canada, noted that “medicinal motivations for use are wide-ranging and encompass what are traditionally thought of as recreational motivations as well.” (2017, p. 218). Lenza (2007) argues that the instrumental motives for using cannabis can be intertwined and are not mutually exclusive. Lankenau et al. (2018) found that authorised medical cannabis patients living in California (US) used cannabis for non-medical purposes, and a proportion of recreational cannabis users reported medical motives for use. In a survey conducted by Sandberg & Pedersen (2013) with recreational and medical users living in Norway, the respondents did not distinguish clearly between their recreational and medical patterns of use.

An example of intertwined motives is the need for the reduction of the physiological and psychological symptom stress, which can be viewed as a medical as well as a recreational indication. The improvement of physical symptoms by using cannabis is beneficial for individuals’ well-being, however at the same time cannabis’ psychoactive effects may also enhance patients’ quality of life directly. For instance, more often severely ill patients do not rely solely on cannabis for their symptoms but also to enhance their general well-being or to cope with emotional distress (Prentiss et al., 2004). It happens more often that severely ill people use cannabis to improve their well-being while taking other medications to treat their diseases and symptoms (Chapkis, 2007; Lucas & Walsh, 2017). These examples illustrate the thin line with recreational use, since many people use cannabis ‘recreationally’ to relax or calm down, for example after a stressful day at work (Osborne & Fogel, 2008).

Some medical cannabis users consider mental distress (e.g. anxiety and stress) as not a legitimate condition for the use of cannabis as a medicine; it is perceived as too trivial to warrant such medication. ‘Real’ medicinal users see those self-defined health purposes as justifications for recreational cannabis use (Pedersen & Sandberg, 2013; Grella et al., 2014). Stress is not considered to be an internal disorder. When cannabis is used for the reduction of stress it is seen as a method for escaping reality by using mood alternating drugs. Coping with mood alternating drugs would not be a legitimate medical indication (Rosenthal et al., 1997). However, Chapkis (2007) argues that escaping reality through the use of cannabis might be an important way to cope with life for seriously ill people or terminal patients.

Previous research performed by O’Brien in 2013 examined medicinal cannabis use in a student population at a university in Colorado in the US. The study revealed that students who were in possession of a medical marijuana license used cannabis for reasons different from the qualifying conditions of Colorado’s medicinal marijuana program, which included glaucoma, HIV, cancer, MS, etc. Instead, relaxation was often cited as the motive for using cannabis. The students thought this was a legitimate medical motive. They considered the health benefits they experienced as justifying reasons and they criticised the narrow list of acceptable medical conditions in medical marijuana programs. Furthermore, they believed that many other medicinal cannabis users consumed for unaccepted conditions as well (e.g. relaxation), since the percentage of individuals using cannabis for chronic pain would hugely exceed the percentages with other qualifying conditions. According to the students,

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chronic pain is hard to assess objectively, thus this condition would be misused for obtaining cannabis for other (non-)medical reasons (O'Brien, 2013). Data about registered medicinal cannabis users in the US do indeed represent these prevalence rates. In 2015, 93.1% of the patients in Colorado were registered under the condition of severe pain (State of Colorado, 2015). In 2010, 92.2% of the medical marijuana patients living in the United States fell into the category of severe or chronic pain (Bowles, 2012). Future studies are necessary to examine if these registered persons use cannabis to alleviate severe pain symptoms, or feign pain issues to obtain cannabis for other purposes.

Medicinal cannabis users who have a more radical vision of medicinal use think that recreational use is also therapeutic, because it helps with reducing stress. Some even claim that recreational use is therapeutic because it makes them happy and this would be healthy (O'Brien, 2013; Satterlund et al., 2015). Following this logic, every pleasurable activity could be considered healthy and consequently therapeutic or medical. Therefore, it is arguably important to prevent the concept of 'medical' from turning into a catch-all term or a justification for recreational use. This would lead to the medicalisation and pharmaceuticalisation of everyday life problems and events (Conrad, 2007).

From the medicinal cannabis users' point of view, this study intends to identify the symptoms and conditions which are considered to be legitimate medical indications for using cannabis. In order to tackle this aim, medicinal cannabis users' own symptoms and conditions are described, as well as their opinion on other (health) purposes for which cannabis can be used.

The type of medical condition or symptom treated with cannabis is not the only determining factor in the construction of the concept of 'medicinal cannabis use'. Other aspects that characterise medicinal cannabis use are the (social) setting of use, the experienced effects, the use patterns, the purpose of use and the expectations of the user. These factors differentiate the concept of 'medical' cannabis use from the concept of 'recreational' use (Dahl & Frank, 2011; Dertadian, 2018). Dahl & Frank (2011) asked medicinal cannabis users living in Denmark in in-depth interviews to reflect on the meaning of medical cannabis use. They found that cannabis was not automatically called medical and that the effects were interpreted variously. This depended on how cannabis was used, the purpose of use, expectations of use and the setting. In addition, the medicinal cannabis users in their study reported that cannabis did more than solely relieve symptoms, it also improved their lives in various other respects.

A handful of studies have investigated how cannabis users themselves perceive these blurred boundaries between recreational and medical cannabis use. The crucial issue here is '*where does recreational cannabis use stop and where does medicinal cannabis use begin?*'. Or does this question simplify the reality? There are self-identified medicinal cannabis users who claim that they use cannabis for medicinal reasons, but who are not chronically or severely ill (Pedersen, 2015; O'Brien, 2013). These individuals often self-medicate with the substance for psychological problems, daily discomforts or undiagnosed health problems. Their use can be very similar to the cannabis use of the so-called 'recreational users' (O'Brien, 2013). When exploring the boundaries between the concepts of medicinal and recreational cannabis use, it is important to focus on the overlapping elements between the two types of use.

### 2.1.1 Comparing the profiles of medicinal cannabis users with those of recreational users

In several studies in which the profiles and patterns of use of medicinal cannabis users are examined, there is a focus on the ambiguity between recreational and medicinal use. These studies suggest that there is a strong association between medicinal and recreational use, i.e. a large number of medicinal cannabis users have experience with recreational cannabis use (Reinarman et al., 2011; Lucas, 2012; Ware et al., 2005; Pacula et al., 2016; Swift et al., 2005; Lankenau et al., 2018a). A significant number of (self-described) medicinal cannabis users experience the therapeutic effects of cannabis themselves while they are using it for recreational purposes (Ogborne et al., 2000; Swift et al., 2005; Lankenau et al., 2018a). In addition, many medicinal users continue using cannabis recreationally alongside their medicinal use (Pacula et al., 2016; Schauer et al., 2016; Furler et al., 2004; Dahl & Frank, 2011).

Several studies have been conducted that compare medicinal with recreational cannabis users (Sznitman, 2017; Lankenau et al., 2018; Lin et al., 2016; Loflin et al., 2017; Goulet-Stock et al., 2017). These studies show that there is an overlap between medicinal users' (sociodemographic) characteristics and those of recreational users (Roy-Byrne et al., 2015; Lankenau et al., 2018; Lin et al., 2016). Roy-Byrne et al. (2015), found in their study that the two groups of users were more alike than different (e.g. similar psychiatric symptoms and behaviour comorbidity). The cannabis users changed from group membership, i.e. medical and recreational user, in both directions.

Nevertheless, a study from Swift et al. (2005) concluded that the profile of older medicinal cannabis users did not fit the stereotype of a recreational user. Two studies found that recreational cannabis users were younger and more likely to be male than (authorised) medicinal cannabis users (Sznitman, 2017; Hakkarainen et al., 2019). Most recreational users have an infrequent use pattern and use occasionally, whereas medicinal cannabis users consume cannabis more frequently and consistently, often daily (Bostwick, 2012; Lin et al., 2016; Walsh et al., 2013; Sznitman, 2017; Pacula et al., 2016; Roy-Byrne et al., 2015; Goulet-Stock et al., 2017). Medicinal cannabis users are more likely to use cannabis alone (Sznitman, 2017; Roy-Byrne et al., 2015). In addition, recreational use is more spontaneous, whereas individuals who use cannabis for therapeutic purposes are thoughtful and prescriptive with their use (Bottorf et al., 2009). According to Bostwick (2012), the goals of medicinal and recreational cannabis users as well as their preferred routes of administration would be different. Medicinal cannabis users vaporise and eat cannabis products more often compared to recreational users. However, smoking is still the dominant method of administration in both populations (Pacula et al., 2016; Sznitman, 2017).

Next, people who use cannabis medicinally have a greater disability when performing activities, have more psychological distress, and have worse overall physical and psychological health than recreational users (Lin et al., 2016; Lankenau et al., 2018; Roy-Byrne et al., 2015; Goulet-Stock et al., 2017). Previous studies found lower prevalence rates of illicit substance use, alcohol use and alcohol use disorders among medicinal cannabis users (Lin et al., 2016; Roy-Byrne et al., 2015; Goulet-Stock et al., 2017). The prevalence of cannabis use disorders would be the same among the two groups (Lin et al., 2016; Bonn-Miller et al., 2014).

When looking at the profiles of medicinal cannabis users and comparing them with those of recreational users, it is important to keep in mind that there is a subpopulation of medicinal users who have never used cannabis recreationally or who have not used it for a long time before they started using medicinally (Reinarman et al., 2011; Page & Verhoef, 2006; Lucas, 2012). Studies that examine medicinal cannabis user profiles by making a distinction between users who have a non-medical cannabis history and participants who have used cannabis exclusively for medical purposes are scarce (e.g. Walsh et al., 2013; Boehnke et al., 2019). Walsh et al. (2013) found no differences among Canadian self-selected therapeutic cannabis users between individuals with and without a history of non-therapeutic use regarding demographic characteristics, medical conditions and symptoms. Boehnke et al. (2019), on the other hand, found multiple significant differences among American medicinal users. Since there is a dearth of studies focussing on the differences and similarities between medicinal cannabis users with and without a history of non-medical cannabis use, the present study aims to fill in this gap by comparing them in several respects. ‘Self-identified medicinal cannabis users’ who participate in the survey of the present study will be divided into three mutually exclusive subpopulations in the analysis, including: exclusively medicinal cannabis users (no history of recreational use), former recreational users (not using recreationally anymore), and current recreational users (using recreationally in the present).

### *2.2 What is a ‘medicinal cannabis user’?*

In studies surveying people who use cannabis for health purposes the term ‘medical marijuana/cannabis user’ is often used for people who are authorised to use cannabis medicinally in official medical marijuana programs, whereas ‘therapeutic cannabis use’ is applied more generally for cannabis use that is assumed to be beneficial for one’s health (Fischer et al., 2015). For instance, in the study of Reiman (2008) conducted in California (US), the researcher defined and included individuals as ‘*medical cannabis patients*’, when he or she had received a recommendation from a physician that indicated that cannabis use would be beneficial for the treatment of her or his conditions. Lankenau et al. (2018) defined cannabis users whose cannabis use was approved by a physician as ‘*medical marijuana patients*’ and participants whose use was not as ‘*non-patient users*’. This study was also conducted in California.

In the empirical part of this study it is practically impossible to make the same distinction between ‘medicinal’ and ‘therapeutic’ use since cannabis cannot be obtained legally in Belgium. Therefore, it will be less likely that medicinal cannabis users are authorised by their physicians. Belgian patients have the possibility to obtain cannabis in Dutch pharmacies when a physician prescribes cannabis, however transporting cannabis to Belgium remains illegal (FAGG, 2017). Therefore, I assume that the number of medicinal cannabis users who obtain their cannabis on prescription will be a small minority.

This study explores **self-reported medicinal cannabis use**, which implies that the research population consists of people who label themselves as medicinal cannabis users. This means that the identity of ‘medicinal cannabis user’ is not based on the judgement of a physician, but on the perspectives of the

participants themselves. The study focusses on all possible profiles of people claiming to use cannabis for medicinal reasons. Since few studies have examined self-proclaimed medicinal cannabis users (e.g. Pedersen & Sandberg, 2013; Swift et al., 2005), this study intends to fill in this gap by describing the profiles and characteristics of this population living in Flanders (Belgium).

The scientific literature indicates that many medicinal cannabis users opt for cannabis to cope with a variety of psychological and physical problems (Swift et al., 2005; Ogborne et al., 2000). Numerous studies conducted with severely or chronically ill people (e.g. cancer patients) show that these participants use cannabis to relieve physical pains and discomforts and/or to cope with psychological disorders and symptoms, such as depression and anxiety (Prentiss et al., 2004). In addition, studies that recruit outside medical settings indicate that people do not use cannabis exclusively to treat physical disorders. Cannabis is also, and more often, used to treat psychological problems (Swift et al., 2005). These studies clearly illustrate that individuals use cannabis for a broad variety of symptoms and disorders. This current study intends to capture the broad variety of indications for cannabis use and the reasons why people choose cannabis as their treatment. Studies show that people who use cannabis to cope with psychological symptoms have more drug-related problems (Babson et al., 2013; Bonn-Miller et al., 2014). Therefore, particular concern should be directed to vulnerable groups such as persons with mental disorders, as they consistently show higher rates of substance abuse than the general population (so-called dual diagnosis). The self-medication hypothesis is therefore a potential etiological explanation for dual diagnosis (Henwood et al., 2007).

Since the term ‘medicinal cannabis use’ is not defined a priori, respondents will not be excluded based on the genuineness or severity of the conditions for which cannabis is consumed. Individuals who do not necessarily actively label themselves as ‘medicinal cannabis users’, but who use cannabis for health reasons, are equally admitted to my study. I look into the reason why they do not identify themselves as medicinal cannabis users or why they doubt this label. For instance, some cannabis users may consume cannabis to relieve particular ailments but do not label their use as medicinal per se and consider themselves recreational cannabis users (Lankenau et al., 2018a). Their attitudes towards cannabis might differ from those who actively defend the medical purpose of their use.

Patients’ narratives enable us to look at their (new) identities as medical patients (Conrad & Barker, 2010), in this case the identity of medicinal cannabis users. The label of ‘medicinal cannabis user’ can be used to give meaning to one’s cannabis use. Pedersen (2015) found in his study that self-medicating cannabis users give meaning to their deviant behaviour by giving themselves the diagnosis of a psychological disorder (i.e. ADHD). Self-medicating individuals who diagnose themselves with disorders give meaning to their behaviour and identity but at the same time they might justify their cannabis use. This is an important aspect of why ‘self-defined medicinal cannabis use’ is examined in the present study, since this way it is possible to look at the identities of self-diagnosed and officially diagnosed individuals who identify themselves as medicinal cannabis users. The aim is to explore how they view and interpret the concept of ‘medicinal cannabis use’, and how they build their identity around this label. For example, they may distance themselves from the recreational label to give themselves a

medical identity and to avoid stigma (Pedersen & Sandber, 2013). This study focusses in on the process of becoming a ‘medicinal cannabis user’ by principally gathering information on life events that led to the use of cannabis (Lankenau et al., 2018a; Athey et al., 2017). Qualitative methods will be employed for an in-depth examination of the user’s personal and medical history.

By including a broad range of medicinal cannabis users, it is possible to construct a typology of medicinal cannabis users, built on empirical research findings. In order to construct this typology, a comparison between medicinal cannabis users’ characteristics, experiences, motives for use, attitudes and use patterns is required. This comparison will not be performed at random, but draws on theoretical orientations derived from the literature (Boehnke et al., 2019). This study aims to identify differences among self-declared medicinal cannabis users with regards to sociodemographic characteristics and their experiences and attitudes towards medicinal and recreational cannabis use.

### *2.3 Medical cannabis use versus misuse*

The ambiguity of the term ‘medicinal cannabis use’ is also clear from the diverging medical cannabis regulations worldwide. Firstly, medicinal cannabis policies differ with regards to the type of cannabinoid and cannabis-based medicines that are allowed to be used medically. For instance, certain countries only allow pharmaceutical cannabinoid medicines (e.g. Belgium), while others allow the herbal plant (e.g. the Netherlands). Secondly, the lack of consistency in scientific evidence results in countries having diverging regulations regarding the diseases and conditions which are allowed to be treated with cannabis products. As a result, the use of cannabis to cope with certain conditions (e.g. epilepsy) will be medically approved in certain countries, while unapproved in other countries. It is important to note that the number of clinical studies examining cannabis’ therapeutic properties and health risks continues to expand. This means that there will be more clarity in the future on the objective benefits of cannabis treatments and for which conditions and symptoms it is safe and appropriate to use cannabis medically. The accumulation of scientific knowledge will probably result in more uniform regulations.

As it is currently difficult to distinguish clearly between ‘medical’ and ‘non-medical’ cannabis use, it is difficult as well to draw a dividing line between ‘medical use’ and ‘misuse’. In medical terms misuse arises when people use their prescribed medication too frequently or unnecessarily, according to the prescriptions of the responsible physician. Using medication for the wrong purposes, which means reasons other than getting a doctor’s prescription, is considered to be misuse (NIH, 2015a). Medical grade cannabis obtained for medicinal purposes (e.g. relieving chronic pain) at pharmacies with a prescription, only to be used recreationally (e.g. for pleasure) is an illustration of this type of misuse. There are several medical practitioners and policy makers who have expressed concerns regarding the misuse of medicinal cannabis for recreational purposes (Ziemianski et al., 2015; Lucas, 2009). In this example the ‘misuse’ is quite clear. A more difficult question to answer is whether, for instance, cancer patients who obtain cannabis in order to prevent nausea, but who use it solely for or in addition to try to

cope with depression, is a form of misuse. Nevertheless, the alleviation of depression of severely ill people would be beneficial for their quality of life and healing process. Furthermore, Bakalar and Grinspoon (1997) state that the treatment of depression with cannabis may alleviate pain perception of people dealing with chronic pain.

When conventional prescription drugs are used recreationally, their use is considered to be misuse. Misuse is often defined as the non-medical use of mood altering drugs. Because there is no conclusive information (yet) for which conditions cannabis products are medically approved, and because the use of cannabis is still illegal in many countries, by which any consumption is inherently considered as ‘misuse’, it is hard to determine when cannabis is misused in medical terms. In Belgium, because of the illegal status of cannabis, every type of use is considered to be misuse, independently of users’ motives for consumption. The misuse does not depend on whether the use is appropriate or inappropriate, but the illegal status of cannabis means that the substance itself is condemned, and any use is translated into misuse or abuse. In a country like Belgium, medical misuse cannot be claimed, first because there are no medical guidelines, and second because cannabis use is in any case illegal, except for the use of Sativex®.

It is possible that if cannabis were to be approved as a medicine in Belgium, it would only be allowed for use as a treatment for certain medical conditions. This is currently the case for the cannabis-based medicine Sativex®. Similar to current regulations on opioid drugs, it could be that the use of cannabis for particular physical improvements (e.g. neuropathic pain) is recognised, while the recreational use of cannabis is considered to be misuse. If recreational cannabis use were to be legalised alongside medical use, there might be a socially and legally constructed distinction between the two types of use. When cannabis is approved and produced as a medicine, authorities might limit the cannabis products and methods of administration which fit within a medical framework. For instance, when herbal cannabis is smoked it can be considered as medical misuse, by only allowing pharmaceutical cannabis products and medical ingestion methods.

The term ‘medical use’ is not open to all kinds of interpretations. Medical professions and institutions have developed definitions for the term. These definitions enumerate criteria which the drug use must meet before it can be called medical. An example of such required criteria for medical use to occur can be found in the study of Bardhi et al. in 2007 and reads: “a) a physician diagnoses and provides a written prescription for specific pills and dosage unit(s), b) the patient/consumer purchases such pills from a legitimate pharmacy, and then c) swallows the pills on a schedule as specifically directed by the physician.” (p. 56). If the use of a substance fails to meet one of the three criteria it is considered misuse. If we apply these standards to the use of cannabis, there will be very few cases which fulfil these standards today. In Belgium, where cannabis is an illegal substance and where only one particular pharmaceutical cannabis-based medicine is legalised, probably very few people will use cannabis medically if we apply these criteria. The use of these kind of -more narrow- definitions of medical use will not add value to the theoretical framework of this study and will not be helpful in the empirical part of the present study. It is impossible to use these definitions to construct inclusion criteria for the

respondents i.e. whether or not they will be included as a medicinal cannabis user. In this study the interpretation of the term ‘medicinal’ is up to participants themselves since we depart from the user perspective.

The reason why the concept of ‘medicinal’ is not defined a priori, and why the study is open to a broadly defined research population, is to discover what people mean when they claim that they use cannabis for ‘medicinal purposes’. The aim of this study is to unravel what people define as a legitimate ‘medicinal cannabis user’ and what is meant by ‘medicinal cannabis use’. Firstly, the study investigates measurable objective facts, including the characteristics of people participating in this study and the way cannabis is used as a medicine and a recreational drug. Secondly, it studies the participants’ personal opinions, including their attitudes towards the use of cannabis. In this way, I aim to deconstruct and reconstruct the two specific concepts of ‘medicinal’ and ‘recreational’ cannabis use, based on participants’ own perspectives and experiences. This study contributes to theoretical literature on recreational and medicinal cannabis use, by exploring the concepts of ‘medicinal’ and ‘recreational’ cannabis use through a critical lens.

### *2.4 Medicalisation: ‘a cannabis strain for every pain’*

In recent years the use of cannabis has been medicalised. Medicalisation is the process in which nonmedical problems are translated into medical problems, such as diseases (e.g. alcoholism). As a result these medical problems are also treated with medical interventions. Abnormalities which were not classified as a disease earlier are now considered to be health problems that are tackled with- sometimes expensive- treatments, thereby broadening the scope of the healthcare system (Huber et al., 2011; Conrad, 2007).

Nowadays, we can speak of a ‘re-medicalisation’ of cannabis (see Taylor, 2010), as cannabis no longer belongs solely to the socially constructed category of ‘illegal drugs’, but more and more it is given ‘legitimate therapeutic potential’. This is not the result of chemical changes within cannabis, but that change was driven by needs on the individual level (patients) and picked up by the meso-level (scientific, medical and economic interests). Patients’ discourses on medical cannabis influence practice, but also the rapid evolving medical and pharmaceutical cannabis industry shapes the way medicinal cannabis is viewed and defined.

The medicalisation of cannabis is rather unique, since it is the intervention that is medicalised in the first place, and not normal social, behavioural or bodily conditions. This medicalisation is different from most medicalised behaviour, since it is the treatment that is medicalised instead of a behaviour (e.g. alcoholism) or life processes (e.g. menopause) (Conrad, 2007). Cannabis is often used for problems that are already medically acknowledged, for example CINV and chronic neuropathic pain. However, cannabis is also used through self-medication for self-defined health purposes for which scientific evidence is currently lacking (e.g. depression), which leads to the expansion of medical interventions.



We can also speak of pharmaceuticalisation of cannabis (Abraham, 2010), because of the increase in the number of pharmaceutical cannabis-based and synthetic cannabinoid products. The pharmaceutical industry and the production of medications is heavily influenced by power relations and the interests of big corporations. According to Elliott (2004), the pharmaceutical industry would be responsible for the (re)production of certain diseases. Feelings like anxiety, stress, grief, and fear are transformed into medical problems and biological diseases which can be treated with pharmaceutical pills. In this way, the medical industry is partly responsible for the expansion of mental diseases and diagnostic categories. Graham (2011) argues that the medical industry is able to define the diseases that are accepted in medical discourse. He refers to Foucault and his theory of discursive rarefaction of speaking subjects, in which he explains that some parties are recognised and allowed to speak while others are not. The respected physician may contribute to medical issues, whereas marginalised speakers are confined to other fora. The pharmaceutical industry would be increasingly important in the shaping and sharing of medical knowledge to promote their products (Conrad & Barker, 2010). This industry markets diseases and creates medical categories for which their drugs work, in order to increase their sales and profit. This practice is called ‘disease mongering’ and would lead to what is called ‘cosmetic psychopharmacology’. For example, prescription drugs such as antidepressants are sold and advertised for common human experiences and feelings (e.g. sadness). As a result it is accepted that people take pills to deal with minor life problems (Conrad, 2007).

In the improperly regulated commercial cannabis market, cannabis products are advertised as treatments that would be the –almost magical- solution for numerous symptoms and conditions. Cannabis products with a particular chemical composition are purported to be beneficial for particular health problems. However, many of these health claims are unfounded. For instance, non-psychoactive CBD products are becoming increasingly popular and are promoted as (prophylactic) therapeutic treatments for life style diseases (Hazekamp, 2018) and everyday discomforts. Nowadays, a familiar saying is that “*there is a pill for every ill*”; in the case of cannabis it should read that “*there is a cannabis strain for every pain*”. Pharmaceutical and other profit-oriented companies contribute to the expansion of medical indications for the use of cannabis, and thus they fuel medicalisation. There are multiple factors that play a part in the medicalisation of cannabis on the macro level, including the medical interest in cannabis from scientists and the development of (patentable) ‘medical’ methods of delivery for cannabis, which demonstrates the distinction between recreational and medical cannabis use. The number of studies looking into the possibility of using cannabinoid treatments for conditions widely prevalent among the general population, such as sleep problems and anxiety, are on the rise (e.g. Shannon et al., 2019; Bergamaschi et al., 2011).

Medicalisation is often considered to be driven by the powerful (e.g. the pharmaceutical industry) and characterised by professional dominance with control as the underlying intent (Bell & Figert, 2012). The initial process of the medicalisation of cannabis was not constituted by economic interests or medical power, but by cannabis users themselves who were actively advocating for the recognition of cannabis as a legitimate medicine. This, on an individual level as well as collectively, can be viewed as

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a form of social movement. Lay knowledge and medical activism played an important role in the medicalisation of cannabis (Taylor, 2010). It is medical cannabis patients themselves who have a leading role in this medicalisation process. This is similar to other social movements, in which patient organisations and individual patients that have pushed for medicalisation, for instance in the cases of alcoholism and ADHD (Bell & Figert, 2012; Pedersen & Sandberg, 2013). Pedersen & Sandberg (2013) conclude in their study that cannabis users themselves contribute to this medicalisation, because they broaden the scope of conditions for which cannabis is used.

In the case of cannabis, the medicalisation is clear on the macro level as cannabis becomes a solution to health problems in large populations (Pedersen, 2015). The medicalisation of cannabis is also discernible on the micro level since individuals conceptualise their cannabis use within different frameworks than before. Medicinal cannabis users no longer view their behaviour in a criminal framework, but in a medical one. This is first of all noticeable by (the changes in) the discourse of (self-identified) medicinal cannabis users. Individuals who consider themselves as medicinal cannabis users explain their behaviour often in medical terms (O'Brien, 2013; Pedersen, 2015). In the studies of Pedersen & Sandberg (2013), Pedersen (2015), and Bottorf et al. (2009) with self-labelled medicinal cannabis users, the respondents used a medical and pharmacological terminology (e.g. self-medication, placebo effect).

O'Brien (2013) conducted a survey with university students in Colorado (US) who first had to buy their cannabis illegally, but later received a medical card to obtain the drug from medical dispensaries. The study shows that the students distanced themselves from the criminal market and were socialised into a legitimate cannabis business system. They redefined the concepts associated with cannabis because they learned about the medical meanings of cannabis. The medicalisation of cannabis had as a consequence that the students changed their terminology, 'marijuana' was called 'cannabis' and they called themselves 'patients'. In the medicalisation process the new information changed the symbolic meanings previously associated with cannabis (O'Brien, 2013). Pedersen (2015) uncovered that the majority of cannabis users translated their former problematic behaviour (e.g. aggression, criminality, etc.) into an illness (ADHD) that required treatment.

The internet contributes to the medicalisation (Conrad, 2007) of cannabis use as well. The overload of information about medicinal cannabis use on the internet probably leads to an expansion in the number of medicinal cannabis users and the variety of conditions treated with cannabis. For example, the therapeutic efficacy of cannabis for ADHD is often discussed on internet forums (Mitchell et al., 2016a), whereas there is no solid scientific evidence that supports the efficacy and safety of cannabis when used to treat this mental health disorder (Allan et al., 2018). In addition, there are numerous webstores that sell cannabis products that target a broad range of consumers. Those companies, together with the consumers, create and shape the market for medicinal cannabis products at the current moment.

The fact that cannabis users themselves contribute to medicalisation has multiple origins. The illegality of cannabis impeded pharmaceutical companies from developing pharmaceutical cannabinoid products and health care professionals from supervising the use of cannabis for health purposes. Users had to claim the medical purposes of their cannabis use to get social and legal recognition so that their

behaviour and identity would be decriminalised. The wide spread use of the label ‘medical’ cannabis use might be the consequence of recreational cannabis users searching for an opportunity to justify their use, as recreational cannabis use is more stigmatised (Pedersen & Sandberg, 2013; Taylor, 2010). Medicalisation can be beneficial for the users of cannabis when this reduces stigma and when they are able to reintegrate into society because they are able to function again (Conrad, 2007).

The absence of support in the medical profession and limits on insurance coverage are common restraints on medicalisation (Conrad, 2007), and those issues are also valid for medicinal cannabis use. In many debates concerning medical cannabis regulations, patients strongly advocate for access to safe and effective cannabis products used for medical purposes, whilst medical experts and policy makers argue that there is insufficient sound scientific evidence. Even in countries where medical grade cannabis is legally available, there is mixed support from healthcare professionals (Belle-Isle et al., 2014) and lack of reimbursement by (national) health insurance companies (EMCDDA, 2018b).

### *2.5 The controversial cannabis ‘high’*

When substances have psychoactive properties they are often considered to be potentially harmful. This is in particular true for illicit drugs causing pleasurable intoxicating effects. When prescription drugs induce these ‘side effects’ medical guidelines set out that patients have to act carefully and responsibly when taking these drugs. Regulations try to prevent the abuse of these medications so users will not get addicted and develop problems in other areas of their lives. However, Chapkis & Webb (2008) argue that these regulations may also be considered strategies to prevent people from enjoying those psychoactive effects and using the medication for recreational purposes.

Cannabis has the potential to be used recreationally. This is one of the reasons why certain policy makers oppose the use of cannabis as a medical treatment, because enjoying cannabis’ psychoactive effects seems to be inappropriate (Chapkis & Webb, 2008; Walker, 2017). The therapeutic properties of psychoactive medicines are often distinguished from the pleasurable psychoactive sensations they induce (Dertadian, 2018). However, Dertadian (2018) notes that, so far, the medical literature has provided little explanation about what makes these two types of effects distinct.

Cannabis’ psychoactive effects, including the ‘high’, are most of the time defined as side effects when cannabis is used for its therapeutic properties. As Chapkis (2007, pp. 443-444) argues “It is as if the high which makes the drug an attractive recreational substance either disappears with medical use or is nothing more than a trivial side-effect unrelated to the plant’s therapeutic value.” Scientists have investigated the possibility of using cannabis as a therapeutic agent without generating psychoactive effects (e.g. Malan et al., 2003; Mascal et al., 2019), and pharmaceutical companies try to develop cannabinoid medicines that do not generate the psychoactive effects of cannabis (Crowther et al., 2010; Chapkis, 2007). For instance, Russo (2006, pp.166-167) writes the following about a pharmaceutical cannabis-derived spray: “No reports of abuse or diversion of this cannabis-derived spray has occurred

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in clinical trials, long-term extension studies, or general prescription use. Thus, while it has been effective for patients, there is little to suggest that people “like it too much,” or would seek it as an agent of drug abuse.”

The authors of a systematic review that looked into the effectiveness and adverse effects of medical cannabinoids argue that the rate of adverse events is likely underreported since “experienced cannabis users have a reduced risk of adverse events, as they are preselected as resistant, have developed tolerance, or perhaps even **appreciate** [emphasis added] a number of the adverse events (like “feeling high,” euphoria, or sedation)” (Allan et al., 2018, p. e91). Becker (1973) argues that the categories of ‘main’ and ‘adverse’ effects are socially constructed, based on whether they are undesired or desired by the drug user, the medical expert and society more generally (Pedersen & Sandberg, 2013; Cohen et al., 2001; Becker, 1973). Consequently these concepts are open to interpretation. This present study examines to what extent medicinal cannabis users consider well-known ‘side effects’ problematic, with particular attention to the -possibly pleasurable- psychoactive effects.

A proportion of medicinal cannabis users think that the psychoactive effects of cannabis are beneficial for their conditions and thus these become indispensable ‘side effects’. Multiple surveys and qualitative studies conducted among medicinal cannabis users indicate that the experience of being ‘high’ and other euphoric effects are of important therapeutic value for some users. Feelings such as relaxation, well-being, creativity, cheerfulness, restfulness, mood-enhancement, etc. would contribute to cannabis’ overall therapeutic benefits (Swift et al., 2005; Ogborne et al., 2000; Coomber et al., 2003; Dahl & Frank, 2011; Athey et al., 2017; Chapkis, 2007). In the studies of Dahl & Frank (2011) and Chapkis (2007), the majority of the medicinal cannabis users interviewed thought that the psychoactive effects were crucial for distracting attention from their symptoms. In this way, they were more tolerable and patients were able to focus on other things. These subjective benefits can even improve physical symptoms. For example, studies show that the psychoactive properties of cannabis are important for the alleviation of pain (van de Donk et al., 2019). In the study of Page & Verhoef (2006) several MS patients acknowledged that the therapeutic effects of cannabis could not be separated entirely from the ‘high’ experience. However, most of the time medicinal cannabis users’ motivation to use cannabis is not to become ‘high’.

These positive attitudes regarding the psychoactive effects of cannabis are in contrast with medicinal cannabis users who claim that the state of feeling ‘high’ and the associated euphoric feelings have to be avoided. They regard getting ‘high’ not as therapeutically valuable, but think of this stage of intoxication as an irrelevant or unpleasant side effect (Ogborne et al., 2000; Hazekamp et al., 2013; Pedersen & Sandberg, 2013; Pedersen, 2015; Page & Verhoef, 2006). Previous studies found that the most commonly reported side effect among MS patients, AIDS patients, and patients living with non-cancer pain who use cannabis for medicinal purposes, was the ‘high’ (Clark et al., 2004; Ware et al., 2003; Ware et al., 2003a). For people who have never used cannabis recreationally the psychoactive effects of cannabis can be uncomfortable. As a consequence some individuals who are inexperienced with the use of psychotropic substances quit their cannabis use or do not start with it (Page et al., 2003).

In the study of Dahl & Frank (2011) medicinal cannabis growers in Denmark did not bring up the pleasurable effects of cannabis when explaining medicinal use in qualitative interviews. These effects seem to be unimportant and avoidable to certain medicinal cannabis users (Pedersen & Sandberg, 2013). Some might also downplay the psychoactive effects of cannabis and highlight the therapeutic effects, because the former are stigmatised and perceived to be an obstruction for cannabis to become an accepted medicine (Chapkis, 2007). For some medicinal cannabis users it seems to be crucial to make a distinction between the therapeutic effects of cannabis and the feelings which are experienced when being 'high' or 'stoned'. These latter states of intoxication seem to be associated more with psychedelic effects and restless feelings, while the former are considered to yield physical benefits (e.g. analgesia) and they improve relaxation and sleep (Pedersen & Sandberg, 2013). This distinction is, however, often ambiguous. For example, relaxation is mentioned frequently as a recreational purpose as well as a therapeutic purpose of use (Green et al., 2003; Newhart, 2013).

In the study of Coomber et al. (2003) medicinal users claimed that they do not need to get 'high' to experience therapeutic effects, however what participants understood as a 'high' varied. In addition, some medicinal users do not experience a 'high' due to their disabilities, high frequency of use and controlled use. More often tolerance is developed for these intense states of intoxication (Chapkis, 2007; Newhart, 2013). Ill individuals who were previously recreational users report no longer being able to feel 'high' (Chapkis, 2007). Some medicinal cannabis users argue that they no longer feel the need to be as intoxicated as when they were using cannabis recreationally, however they also do not reject the euphoria caused by cannabis. It appears that when shifting from recreational to medicinal cannabis use the intoxicating effects of cannabis lose their previous importance (Pedersen & Sandberg, 2013; Pedersen, 2015).

Obviously, there are degrees in levels of intoxication and there are differences between the types of psychoactive effects. It is very likely that one does not necessarily have to be 'high as a kite' to experience the therapeutic benefits of cannabis' psychoactive properties. These intense states of intoxication would probably only lead to the experience of adverse effects.

So far, few studies have looked into the 'highs' of prescription drugs in the context of medical use (e.g. Keane, 2008; Dertadian, 2018). While prescription drugs are consumed, produced, and regulated in different contexts than illicit drugs, the chemical composition of some of these substances is very similar, such as Ritalin® and amphetamine (Keane, 2008). The effects experienced when using these substances is likely different due to the context in which the substances are consumed. For instance, the study of Keane (2008) shows that there is no evidence that children who consume Ritalin® show the same cravings and pleasure seeking behaviour as illicit amphetamine users. Euphoria, pleasure and the 'high' is almost never reported with Ritalin® use, which would limit the risk of abuse. Keane explains that the expectations of what Ritalin® is supposed to cause in children's behaviour is very different from the effects sought after by illicit drug users, i.e. improving discipline, concentration and learning abilities instead of enjoying oneself. This is largely the consequence of the different social responses to both

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substance categories. Furthermore, Ritalin's® dose and dose frequency is regulated and supervised by medical authorities, which is different from illicit drug use (Holt & Treloar, 2008; Keane, 2008).

The differences between the experiences of medicinal and recreational drug use is likely partly due to the differences in 'set' and 'setting', as described by Zinberg (1984). This means that the effects experienced by healthy individuals trying to get intoxicated by cannabis for pleasure in a social setting (e.g. partying) probably differ from the effects experienced by ill individuals trying to cope with pain, for example in a hospital setting (Chapkis, 2007; Coomber et al., 2003). Both the social context as well as the expectations of use are different in this example. This equally applies to the use of other psychoactive medicines, such as opiates (Pedersen & Sandberg, 2013).

Most drug policy approaches have in common that they focus on the harms and risks of drugs (Holt & Treloar, 2008). Pleasure associated with illegal drugs is not acknowledged and is socially unaccepted, while pleasure is often an essential component when using legal psychoactive substances, such as alcohol. Pleasure cannot be overlooked when discussing the use of licit and illicit drugs and may even be important in medical treatments (Holt & Treloar, 2008). One could argue about why it would be beneficial to deny drug induced pleasure in medical treatments when it is unknown what effect it has on treatment outcomes. The following quote about pleasure in a medical context comes from Keane (2008), who discusses pleasure in the context of Ritalin® use: *"The medical use of psychoactive substances requires careful differentiation between the illicit hedonism of the drug user and the therapeutic benefits experienced by the legitimate patient."* (p.403). However, how do we define who is a 'legitimate patient' or what 'therapeutic benefits' include? These two concepts are both interpretative social constructs.

In the context of Ritalin®, Keane (2008) argues that: *"[...] medical use of psychoactive drugs is justified because it does not produce euphoria or a high, but rather returns the subject to a state of normality"*. (p. 405). The 'high' of cannabis is assumed to cause 'abnormal' behaviour which is the opposite of 'normal' behaviour which is pursued when Ritalin® is used by legitimate patients. Consequently, the psychoactive effects of cannabis are not justified and socially disapproved when the substance is used for medical purposes.

What currently constitutes an important distinction between recreational use and medicinal use is the social construction of the 'high' as a desired effect when using recreationally, and as an adverse event when using medicinally. It remains unclear what medicinal cannabis users think of the psychoactive effects of cannabis, which are mainly sought-after by recreational users. Some medicinal cannabis users regard these psychoactive effects or 'the high' as unpleasant side effects while other users think they are therapeutically valuable (Ogborne et al., 2000; Page & Verhoef, 2006). That said, what do medicinal cannabis users actually mean when they refer to 'feeling high'? In multiple studies, medicinal cannabis users mention mental relaxation as a therapeutic effect (O'Brien, 2013), while relaxation is also a desired effect when using recreationally and experienced when feeling 'high'. Psychoactive effects like relaxation and sedation seem to be accepted, while other feelings like euphoria and 'being stoned' seem to be neither experienced nor sought-after by medicinal cannabis users. When medicinal cannabis users

indicate (dis)liking ‘the high’, it is important to discover what particular psychoactive effects generated by cannabis are (dis)liked.

Multiple quantitative surveys conducted among medicinal cannabis users list the ‘high’ as a side effect when asking about the side-effects of cannabis (e.g. Clark et al., 2004; Ware et al., 2005). The respondents can choose whether or not they consider the ‘high’ as a side effect and to what extent it is troublesome. On the other hand, other studies not only consider the ‘high’ as a side effect, but also investigate the therapeutic value of the ‘high’ (e.g. Chapkis, 2007; Dahl & Frank, 2011). Chapkis (2007), Pedersen & Sandberg (2013), and Dahl & Frank (2011) focussed in their studies on the meaning of psychoactive effects to medicinal cannabis users. They found that the psychoactive effects were experienced, interpreted and valued differently when using cannabis for medicinal or recreational purposes.

Despite the research findings discussed above, there is still a lack of detailed research evaluating the psychoactive effects of cannabis in medical contexts. This study tries to fill in this gap by describing which particular psychoactive effects medicinal cannabis users consider to be therapeutically valuable and which not. This study tries to identify the wide range of effects experienced when using cannabis for therapeutic and recreational purposes. Identifying the psychoactive effects of cannabis is first of all important to understand the user experience. However, they also appear to play an essential role in defining the concepts of ‘medicinal’ and ‘recreational’ cannabis use.

### **3. Stigma associated with illicit and recreational cannabis use**

Cannabis has a long history and a wide prevalence of recreational use. In addition, most countries criminalised the use of cannabis many years ago and policymakers have been disseminating fear-based prevention messages concerning the dangers of cannabis. These developments have led to the fact that cannabis carries a stigma among the general public today. Although the normalisation of cannabis continues to increase, certainly among the younger generations (Hathaway et al., 2011; Satterlund et al., 2015), the stigma associated with cannabis has not disappeared yet, because of its illegal status, its use for recreational purposes, and its association with certain minority populations.

This stigma associated with cannabis use haunts medicinal cannabis users as well (Bobitt et al., 2019). Previous studies suggest they have been labelled with stigmatizing terms such as drug addicts, dealers, stoners, criminals and potheads who want to take advantage of the law (Satterlund et al., 2015; Bottorf et al., 2013). Illicit drug users are one of the most stigmatised drug using populations. In addition, people who suffer from severe chronic health problems experience stigma as well. Individuals living with psychological disorders are among the most stigmatised ill populations (Staniland, 2011; Rössler, 2016), and their prevalence is high among self-identified medicinal cannabis users (Swift et al., 2005; Ware et al., 2005; Lankenau et al., 2018; Grella et al., 2014). This implies that medicinal cannabis users can experience intersecting forms of stigma because of their multiple stigmatised identities. The

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accumulation of these stigmas causes additional physical and emotional distress for people who already experience inconveniences (Bottorf et al., 2013).

The stigma associated with cannabis use influences the behaviour of medicinal cannabis users. It causes individuals to hesitate in using and purchasing cannabis for medicinal purposes. They prefer to stay anonymous when buying cannabis discreetly (Satterlund et al., 2015). Previous research suggests that medicinal users are embarrassed in coming forward to other people about their use as they are afraid they will be rejected. They feel in particular stigmatised by physicians, law enforcement and employers (Bottorf et al., 2013). In the study conducted by Lau et al. in 2015 cannabis users living in California (US) reported that they were hesitant to disclose their cannabis use as they were afraid of their privacy and their professional career being damaged. When cannabis is socially and legally unaccepted, the user may feel more uncomfortable using the substance. Zinberg (1984) argues that the illegality and social taboo of a drug causes more negative experiences when using the drug. For example, the user might experience anxiety reactions, because he or she does not know what to expect or expects negative sensations.

The stigma associated with medicinal cannabis use may destabilise the user's social relationships and interactions. While friends and family members of medicinal users are most of the time supportive (Coomber et al., 2003), it does happen that medicinal users get rejected by their family (Swift et al., 2005; Ogborne et al., 2000; Page & Verhoef, 2006). The study of Page & Verhoef (2006) showed that this disapproval resulted from the illegal status of cannabis, its adverse effects and its addictive potential. It happens that medicinal users are not believed when they explain the therapeutic properties of cannabis, and also the severity of their symptoms is questioned (Bottorf et al., 2013). Other users are not rejected by their family and friends, but still feel stigmatised. Some individuals indicate that interactions with non-users cause status loss or social disapproval (Hathaway et al., 2011). In general, medicinal cannabis users think the stigma has an adverse effect on their social bonds and social life, often resulting in isolation (Bottorf et al., 2013).

The stigma associated with cannabis can have negative consequences for medicinal cannabis users' interactions with physicians (Ziemianski, et al., 2015; Coomber et al., 2003). The trusting relationship between physician and patient can be threatened when patients ask their physician to consider cannabis as a therapeutic option. Patients believe that the stigma associated with the recreational use of cannabis influences physicians' attitudes towards its medicinal use (Bottorf et al., 2013). In addition, the sociodemographic characteristics of recreational and therapeutic users show similarity (e.g. young and male), therefore physicians may doubt the genuineness of the patient's medical complaint. These elements may cause physicians to question the therapeutic request of patients and the severity of their symptoms (Ziemianski, et al., 2015). Medicinal cannabis patients have reported being falsely accused by physicians of trying to obtain cannabis for recreational purposes, while genuinely needing it for medical reasons (Bottorf et al., 2013).

The negative attitudes of physicians towards cannabis can compromise the relationship between patient and physician, and may lead to undertreatment. The unacceptance of cannabis on the part of physicians



may have an adverse impact on the patient's health, since treatment options are ignored. The stigmatising perceptions among physicians may also act as a barrier to individuals seeking treatment. More often, it takes months or even years for medicinal cannabis users to suggest cannabis to their physician (Page & Verhoef, 2006; Satterlund et al., 2015) as their last hope for an effective treatment. Some even abandon this option because they are afraid they will be rejected by their physician. This is unfortunate for individuals who benefit from cannabis, as they could be helped much earlier if the therapeutic use of cannabis were to be normalised (Satterlund et al., 2015). These indications suggest that the necessary health care treatments for ill individuals are being denied because of the distinction between the socially constructed categories of approved (licit) and not approved (illicit) medicines (Bottorf et al., 2013).

Rudski (2014) assessed the stigma associated with medicinal cannabis use through the opinions of non-cannabis users. This study revealed that methods of administration which are used in Western medical practices were less stigmatised and more accepted than administration methods associated with recreational use. The study also indicates that stigma is higher and acceptance is lower for the use of cannabis for less severe diseases. In addition, cannabis users report less stigma and more acceptance for medicinal cannabis use than non-users.

There are multiple factors that currently contribute to the stigma associated with medicinal cannabis use. These factors should all be tackled by a broad social transformation in order to be able to reduce the stigma. First of all, medicalisation of cannabis instead of criminalisation is likely to destigmatise cannabis use (O'Brien, 2013). Transforming the legal status of cannabis and implementing a medical framework is a first critical step. As a result the focus will shift from the illegal use to the therapeutic use of cannabis. Second, the normalisation of medicinal cannabis use, which implies approaching cannabis similarly to other medications, will be important for reducing the stigma.

For cannabis to become an equivalent medicine, practical and legal changes are necessary (e.g. availability at pharmacies). Second, and perhaps even more important, are the required changes in public opinion and among the medical community. The perception of cannabis has to be changed by considering cannabis also as a therapeutic agent instead of only a mood alternating illicit drug. However, these changes may take place automatically when cannabis is commercialised and supported by medical professionals in the same manner as pharmaceutical products. Therefore, medical professionals should be well-educated to tackle the myths and misconceptions about cannabis. Cannabis users themselves think that misinformation about cannabis is one of the reasons that the use of cannabis is stigmatised (Satterlund et al., 2015; Hathaway et al., 2011). The reduced stigma will, in turn, probably lead to a bigger number of patients trying cannabis as a treatment and physicians considering prescribing cannabis, or at least discussing the option of medicinal cannabis use. The activities of cannabis dispensaries operating in the United States are one example of normalising the purchase of cannabis as a therapeutic agent and making it more socially acceptable (O'Brien, 2013; Lankenau et al., 2018a). Clients of dispensaries think that these outlets decrease stigma. When visiting the cannabis dispensaries they notice that the employees treat them with respect and they make them feel like real patients who

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are in need of a therapeutic treatment (Grella et al., 2014). Also in Canada users thought that being authorised by the governmental program is a way to battle stigma (Belle-Isle & Hathaway, 2007; Bottorf et al., 2013).

A handful of studies have examined medicinal cannabis users' experiences with and feelings of stigma, their strategies to cope with stigma, and how this influences their daily lives (e.g. Satterlund et al., 2015; Bottorf et al., 2013). By conducting qualitative interviews, Bottorf et al. (2013) performed a study that explored the stigma experienced by medicinal cannabis users living in Canada. Satterlund et al. (2015) conducted similar research in California (US). However, the samples of both studies were small (N=23 and N=18 respectively). The legal and social contexts regarding medicinal cannabis use in Canada and California differ remarkably from the Belgian context. Canada has a federal programme that supplies patients with medicinal cannabis, and although medical marijuana dispensaries were illegal in Canada at the time of the study of Bottorf et al. (2013), several operational dispensaries were tolerated by law enforcement. In California, medicinal cannabis users are allowed to buy cannabis at medical marijuana dispensaries. In addition, they can become a formally registered medical marijuana patient and obtain a medical marijuana identity card.

The current study assesses stigma associated with medicinal cannabis use in an illegal context, with the exception of the legally available pharmaceutical medicine Sativex®. In Belgium, medicinal cannabis users do not have the opportunity to become a member of a medical marijuana dispensary nor of a national medical cannabis programme. No membership can serve as a legitimisation or justification for their cannabis use. As a consequence, cannabis is probably less integrated in Belgium than in countries such as Canada. The lack of similar medicinal cannabis institutions could cause Belgian citizens to be less informed about medicinal cannabis use. As a result, it is possible that they are less likely to acknowledge and accept it. It is highly likely that the social acceptance of, and stigma associated with, medicinal cannabis use differs between jurisdictions.

Studies show that numerous medicinal cannabis users experience stigma in various contexts (Satterlund et al., 2015; Bottorf et al., 2013). The particular contexts in which self-proclaimed medicinal cannabis users feel stigmatised, are examined in the present study. Firstly, I examine if self-identified medicinal cannabis users' cannabis use is accepted among their inner social circles. Apart from social circles, it is important to look into the impact of stigma on medicinal cannabis users' relationships with their health care providers. Specific attention will be paid to the influence of stigma on treatment options and outcomes. The impact of experiences and feelings of stigma is equally investigated, by focussing in on the wellbeing of medicinal cannabis users as well as on their cognitive and behavioural responses to stigma.

### *3.1 Stigma coping mechanisms*

Stigma is a social mechanism that activates when people do not conform with moral standards and deviate from normality. People are normalised by internalising norms and disciplinary techniques. Stigmatisation is an internalised mechanism that takes place when this normalisation process fails. People whose actions or behaviour violate social norms and normality are punished by stigmatisation (Hathaway et al., 2011). Link et al. (1997) explain that stigma is a process that can be divided into three steps; **first**, there is a culturally-induced expectation of rejection, **second** there are the actual experiences of rejection, and **third** there are strategies used to cope with stigma. In this study I examine if medicinal cannabis users' express feelings of stigma, and whether these are based on personal experiences of stigmatisation or solely on the knowledge acquired during socialisation. This knowledge refers to the fact that illicit drug use and users are socially unaccepted. During this socialisation process, people become aware of what it means to be identified as an illegal drug user (Link et al., 1997).

When drug users experience stigma, they often use coping strategies to overcome the stigma associated with illicit drug use. These coping mechanisms have behavioural and cognitive components. The behavioural component of stigma translates into the fact that the stigmatised person may engage in secondary deviance such as secrecy as a response to rejection (Link et al., 1997). The cognitive component may include neutralisation techniques used to justify the use of drugs (Peretti-Watel, 2003). The sections below outline behavioural and cognitive stigma management strategies used by (medicinal) cannabis users.

#### *3.1.1 Behavioural coping mechanisms*

When stigma is internalised, measures can be taken based on the assumption that other people could react negatively. Such measures include using cannabis in private, acting and using cannabis responsibly, convincing non-users of cannabis' beneficial therapeutic effects, concealing use, selective or indiscriminate disclosure, the avoidance of drawing attention in a public space with using cannabis, and isolation (Satterlund et al., 2015; Bottorf et al., 2013; Lau et al., 2015). Studies have shown that medicinal cannabis users anticipate the potential reactions that others will have, whether or not they disclose their use. More often, they trust only certain individuals instead of revealing their medicinal cannabis user identity to anyone (Page & Verhoef, 2006; Coomber et al., 2003; Satterlund et al., 2015). These coping strategies and struggles for gaining acceptance play an important role in the lives of many medicinal cannabis users. The secrecy of using cannabis is more often resented by medicinal cannabis users (Dahl & Frank, 2011).

### 3.1.2 Techniques of neutralisation and risk denial

Apart from behavioural strategies, people can adopt cognitive techniques to justify and defend their cannabis use in order to gain social acceptance and to cope with stigma. Two well-known techniques are the ‘*techniques of neutralisation*’ developed by Sykes & Matza (1957) and the ‘*techniques of risk denial*’ introduced by Peretti-Watel (2003).

When individuals use *neutralisation techniques*, they temporarily neutralise norms and values to justify their deviant behaviour. They “remain committed to the dominant normative system” (Sykes & Matza, 1957, p. 667). However, when they behave differently, they do not acknowledge the norms that forbid this particular behaviour and they use justifications for their actions (Hathaway, 2004). For instance, many medicinal cannabis users refer to the medical benefits of cannabis to convince others of the sincerity and legitimacy of medicinal cannabis use (Bottorf et al., 2013). They stress the positive changes that occurred in their life since they started using cannabis (Satterlund et al., 2015).

Individuals must use these cognitive techniques before the deviant act takes place, in order to be able to perform such behaviour and to neutralise the deviant acts afterwards. They must first learn these cognitive skills and be convinced of these techniques in order to convince other people that their behaviour is justified (Sykes & Matza, 1957; Peretti-Watel, 2003). Learning these cognitive skills that precede the deviant behaviour can constitute a long process. For instance, people who have no experience with cannabis use could be resistant to using cannabis because of the stigmatised drug user identity. They will need to convince themselves that there are motives of higher importance than the reluctance to be perceived as a drug user, in order to be able to perform the deviant and stigmatised behaviour. Later on, these motives can become justifications for drug use (Peretti-Watel, 2003). Medicinal cannabis users may think that taking care of their health is more important than violating social norms and the law by using cannabis. It is possible that medicinal cannabis users reinterpret and redefine the concept of a ‘drug user’ and cannabis as a ‘drug’. One may think that his or her behaviour does not fit into the category of a ‘drug user’, by no longer considering cannabis as an ‘illicit drug’ but as an ‘indispensable medicine’. The study of Satterlund et al. (2015) showed that the process of becoming and remaining a medicinal cannabis user was stigmatised.

The *risk denial theory*, introduced by Peretti-Watel (2003), constitutes an updated variant of the neutralisation theory developed by Sykes and Matza (1957). The risk denial theory’s starting point is that individuals are exposed to numerous risks nowadays and that these have to be managed and avoided as well as possible. Unhealthy behaviour, such as smoking and illicit drug use, is regarded as risky behaviour in our current society. As a consequence, this behaviour is subject to stigmatisation (Peretti-Watel, 2003). Drug use is considered a threat to public health and drug users will therefore be stigmatised according to the risk denial theory (Hathaway et al., 2011). Similar to the techniques of neutralisation, individuals apply different strategies to neutralise the risky label and to justify their behaviour (Peretti-Watel, 2003).

Peretti-Watel describes three techniques used by individuals to deny the risky aspect of their behaviour. The **first** technique is called ‘comparison between risks’. When using this technique, drug users compare the risks of the drug they use with the well-accepted risks of other drugs. Techniques of risk denial applied to cannabis use entails that the user compares cannabis’ risks with those of other licit (e.g. alcohol or prescription drugs) or illicit drugs (e.g. heroin) to minimise the risks of cannabis (Peretti-Watel, 2003). In multiple studies in which medicinal cannabis users are surveyed, the respondents compare cannabis with other psychoactive substances regarding the risks they generate (Pedersen & Sandberg, 2013; Dahl & Frank, 2011). They often conclude that cannabis has few or no health risks. Prescription drugs are most commonly compared with cannabis (Pedersen & Sandberg, 2013; Dahl & Frank, 2011). Many medicinal cannabis users claim that their conventional prescription drugs have more severe short-term side effects and health-related risks in the long run than cannabis has (Dahl & Frank, 2011; Satterlund et al., 2015). In addition, cannabis is considered less addictive (Lau et al., 2015; Satterlund et al., 2015). According to medicinal cannabis users, the benefits of cannabis seem to outweigh its risks (Bottorf et al., 2009). Comparing drugs’ risks is a technique commonly used by cannabis users to reduce the stigma associated with its use (Lau et al., 2015).

**Second**, the ‘self-confident’ or ‘self-control’ argument can be put forward to justify drug use (Peretti-Watel, 2003). This argument is based on the assumption that one’s behaviour is accepted by society as long as one does not undertake risky actions. When someone chooses to use illicit drugs and therefore offends a social norm, this person still has the opportunity to claim that his or her use is controlled and that it poses no risks. To demonstrate this control, drug users compare their ‘controlled’ use with an unknown population of other drug users whom they presume to be in less control of their use (Peretti-Watel, 2003). Drug consumers claim that they use drugs only moderately and that they are not addicted, to demonstrate self-control (DeSantis & Hane, 2010; Hathaway et al., 2011).

Similarly, medicinal cannabis users who claim that they have control over their use of cannabis may deny the risks associated with cannabis use (Pedersen, 2015; Bottorf et al., 2009). The study of Peretti-Watel (2003) showed that cannabis users make a clear distinction between the risky misuse of hard drugs and controlled cannabis use. They categorise themselves as responsible drug users and scapegoat other drug users by labelling them as irresponsible drug addicts. By using these techniques of risk denial, cannabis users try to deny the risks of their own drug use by referring to the more severe harms of other drug use.

The **third** and last technique of risk denial described by Peretti-Watel is called ‘scapegoating’. Scapegoating implies that people draw a border between the stereotyped ‘them’ (risky people) and ‘us’ (safe people) (Peretti-Watel, 2003). Scapegoating is a form of symbolic boundary work (Lamont & Molnar, 2002). The stereotyped ‘them’ often concerns a minority group whose members are more stigmatised than the individual whose behaviour is considered to be risky. By using behavioural and cognitive strategies, the individual tries to distance him- or herself from this minority group in order to avoid stigma. At the same time he or she associates with desired social groups (Copes, 2016).

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Cannabis users often distance themselves from ‘hard’ drug users, e.g. heroin users. They try to present themselves as normal citizens in order to experience less stigma and shift the stigma to a more stigmatised group (Peretti-Watel, 2003). Scapegoating or using symbolic boundaries to separate oneself from a stigmatised group is frequently used by illicit drug users. By using these strategies they try to demonstrate that they are not addicts who are the failures or losers of life (Copes et al., 2008). These strategies, like techniques of neutralisation, can be used to convince themselves and others that they are different from the stereotypical drug users and to cope with stigma.

Medicinal cannabis users may scapegoat recreational cannabis users, because they are already stigmatised and sometimes perceived as morally inferior (Pedersen & Sandberg, 2013). While medicinal and recreational use(rs) might show certain overlaps, some medicinal cannabis users try to refute the link between recreational and medicinal use(rs). They are convinced that they differ remarkably from recreational users and they want others to be aware of this difference (Pedersen, 2015). Strategies used to create distance from recreational cannabis use can be behavioural as well as cognitive.

Behavioural strategies reported by medicinal cannabis users include: not acknowledging or taking part in the cannabis subculture and deliberately not involving oneself in the typical lifestyles of recreational users; this implies not using the typical language (e.g. ‘pot’), but using scientific or medical terms (e.g. self-medication); not partying; using different methods of administration; not interacting in the drug trade and with drug dealers; not using other illicit drugs; etc. (Pedersen & Sandberg, 2013; Pedersen, 2015). Cognitive strategies include: focussing on distinct motives for using cannabis and rejecting the ‘high’ induced by cannabis. According to some medicinal cannabis users, they do not need to get ‘high’ or ‘stoned’, which are intoxication stages assumed to be desired by recreational users (Pedersen, 2015; Pedersen & Sandberg, 2013; Bottorf et al., 2009). Medicinal cannabis users emphasise that their motives for using are (exclusively) medical (e.g. pain) and not recreational (e.g. pleasure). In addition, the therapeutic use of cannabis is considered a necessity, while recreational use is deemed a social activity (Bottorf et al., 2013). Medicinal users who claim that they act responsibly (e.g. never using ‘too much’), and portray recreational users as irresponsible users or as drug addicts, are using another strategy to indicate dissimilarity (Pedersen, 2015). Similar to the technique of risk denial in which medicinal cannabis users make a distinction between responsible users and risky users, as a technique of neutralisation they consider themselves to be patients and others to be drug users (Satterlund et al., 2015; Pedersen, 2015).

Another approach to avoid stigma and gain recognition for medicinal use is applied by medicinal users who distance themselves from individuals who claim that their use is medicinal, but who are in their opinion recreational cannabis users who want to get intoxicated (Pedersen & Sandberg, 2013). These ‘real’ medicinal cannabis users consider motives such as stress and headaches as too trivial to be justifiable medical reasons to use cannabis for medicinal use. In this way, they exclude large groups of people and diseases from the category of justifiable medicinal cannabis use (Pedersen & Sandberg, 2013).

### 3.1.3 Normalisation

Drug use normalisation is another coping strategy to battle and protect oneself from stigma. Normalisation can be interpreted as a strategy to avoid stigma when people claim normality as a defence. Many illicit drug users act defensively when justifying their drug use. They claim that they are normal law abiding citizens with moral integrity and that they are not criminals (Berger, 2015; Bottorf et al., 2013; Sandberg, 2012). Medicinal cannabis users participating in the study of Bottorf et al. (2013) explained that they were normal citizens who were obedient to the law. When people focus on normality, they try to show that their deviant behaviour does not entail that their identity or personality are deviant. They emphasise the numerous similarities they have with other people rather than the few dissimilarities. Many medicinal cannabis users compare their cannabis use with the people using prescription drugs, indicating that they are normal patients in need of treatment (Satterlund et al., 2015).

When stigmatised people try to demonstrate 'normal' behaviour and a 'normal' identity, they face insecurity and ambivalence. As a result, they shift between 'bravado' and 'defensive covering' (Goffman, 1963). "Bravado' is a strategy to turn deviance into something positive by exaggerating and boasting it" (Sandberg, 2012, p. 377). 'Defensive covering' is an attempt to justify or excuse the stigmatised deviant behaviour (Sandberg, 2012). Techniques of neutralisation and risk denial, as well as normalising drug use, are examples of this strategy. An example of these techniques is the statement that cannabis is a plant and is therefore healthy (Sandberg, 2012), while pharmaceutical products are 'chemical' and therefore toxic (cf. techniques of risk denial) (Pedersen, 2015; Pedersen & Sandberg, 2013).

## Conclusions

The theoretical findings discussed in this chapter indicate that the lines between medical and recreational use are currently blurred and it would be injudicious to approach them as two completely distinct categories (Ogborne et al., 2000; Pedersen & Sandberg, 2013). This might change in the future when cannabis is viewed fully as a medicine, similar to other psychoactive substances, such as opiates.

Studies show that (self-labelled) medicinal cannabis users often use cannabis for recreational and medicinal purposes concurrently (Boehnke et al., 2019; Lintzeris et al., 2018; Piper et al., 2017). It is assumed that the association of medicinal use with recreational use in public discourse would undermine the social acceptance of medical cannabis use. Disassociating medicinal use from recreational use can be a way to alter the current prevailing perceptions regarding medicinal cannabis and form the basis of policy changes. Medical cannabis patients are aware of this issue and use several dissociation strategies (Pedersen, 2015; Pedersen & Sandberg, 2013), which were outlined in this chapter. The social use of cannabis also causes difficulties for governments and policymakers into developing an appropriate strategy for implementing medicinal cannabis policies. Some researchers claim that without a clear distinction between recreational and therapeutic use it is impossible to develop two distinct strategies to approach the two phenomena (Growing et al., 1998). However, Grinspoon (1999) argues that making a clear distinction between therapeutic and recreational use might be incompatible with human needs. Bostwick (2012) states that it is no coincidence that the increase of recreational use is happening simultaneously with the emergence of medicinal cannabis use.

What is meant by ‘medical’ cannabis use is not always clear and is up to interpretation. The current study aims to unravel the meaning of the concept of medicinal cannabis use by looking at the ways and the purposes for which cannabis is used by self-identified medicinal cannabis users. It explores the thin line between recreational and medicinal use. This study includes self-selected medicinal cannabis users, which means that the concept of ‘medicinal cannabis use’ is interpreted and defined by the respondents themselves. As a result it is possible that people who use cannabis for -what is generally understood as- ‘non-medical’ reasons are included. First, because data are gathered with a web-based survey I cannot check if people are actually using it for medicinal purposes. Second, some people who use cannabis for recreational purposes may claim that they use it for medicinal purposes as a technique of neutralisation. It is possible that cannabis users label their use as medicinal because it is more accepted and less stigmatised than using cannabis for pleasure. There is a dearth of studies investigating the use of this label applied by recreational users as a kind of neutralisation technique. However, because the line between recreational and medicinal use is not always clear, it is difficult to determine whether people are actually using the label of medicinal as a justification for their non-medical use or if they are actually using it ‘medicinally’ in their own opinion.

This chapter illustrates that the cannabis ‘high’, a typical feature of recreational cannabis use, becomes a difficult and sensitive issue when cannabis is used in a medical context. More often, this psychoactive experience is considered a side effect in medical treatments. Since the psychoactive properties of



cannabis seem to generate important barriers for the social acceptance of medicinal cannabis, this study explores the attitudes of self-identified medicinal cannabis users towards these psychoactive effects, both in a therapeutic and non-therapeutic context. Looking into these perceptions enables us to make comparisons between medicinal and recreational use, since achieving certain stages of intoxication is assumed to be the purpose of using cannabis recreationally.

This chapter shows that the stigma attached to cannabis is a reality for medicinal cannabis users as well. Furthermore, the illegal status of cannabis has several negative consequences for people who use it for medicinal purposes. In the present study I focus in on the perspectives of medicinal cannabis users themselves on the illegal status of cannabis in Belgium, and how this influences their daily lives. I focus on how people feel about the fact that cannabis use is illegal and that their behaviour is criminalised and stigmatised. Finally, it is important to understand in which type of legal framework cannabis should be placed from an insider's viewpoint. For instance, when medicinal cannabis users argue that cannabis for recreational use should remain illegal, this might be a strategy to disassociate themselves from recreational use(rs).

The present study aims to identify the cognitive and behavioural strategies used by medicinal cannabis users to cope with stigma. I pay attention to the three steps of the stigmatisation process described by Link et al. (1971), with specific focus on the three risk denial techniques conceptualised by Peretti-Watel (2003). In concrete terms, this means that I examine whether medicinal cannabis users show secondary deviance, compare cannabis with other drugs with regards to their risks, distance themselves from stigmatised drug user populations, use a normalisation discourse, and claim self-control. I aim to unravel if medicinal cannabis users feel the need to justify their medicinal cannabis use and, if they do, what type of justifications these are. In addition to these coping strategies, I look into medicinal cannabis users' real experiences with social disapproval and feelings of stigma. Finally, this study intends to identify the consequences of the stigma associated with cannabis use for medicinal cannabis users' daily lives.



## Part III

### Methodology: a mixed methods approach

#### Introduction

The present chapter details the research design of the thesis and the methodological choices I made during the research process in order to answer the research questions. In this study a mixed methods design was used to examine self-reported medicinal cannabis use.

The first section of this methodological chapter outlines the epistemological considerations (see 1.). Data collection methods and analysis are discussed thereafter (see 2.). The first subsection of the data collection section focuses in on the preparatory steps taken prior to the actual fieldwork, which included exploratory expert interviews, pilot interviews and the test phase of the survey (see 2.1). This study applies a mixed method strategy, by collecting empirical data through a quantitative survey and qualitative in-depth interviews. A detailed description of both data collection instruments is given (see 2.2 & 2.3). The analyses of the quantitative and qualitative data are explained in the corresponding sections. The following subsection outlines how the data were interpreted and reported. In the subsequent section, I focus in on the quality of the research design (see 3.). The next section covers the study population and details the sampling and recruitment methods (see 4.). The final sections detail the limitations of the study and ethical considerations (see 5. & 6.).

#### 1. Epistemology

Most population-based studies into medicinal cannabis use utilise quantitative research methods (e.g. Swift et al., 2005; Hazekamp et al., 2013; Aggarwal et al., 2013). In these studies, the collection of data is mostly accomplished by conducting surveys in different forms (e.g. web-based, paper and e-mail). A handful of mixed methods and qualitative studies exist (e.g. Pedersen & Sandberg, 2013; Coomber et al., 2003; Ogborne, 2000; Chapkis & Webb, 2008; Newhart, 2013).

This study has a mixed methods design, in which qualitative (in-depth interviews) and quantitative methods (an online survey) are combined. A mixed methods design is defined as “research in which the investigator collects and analyses data, integrates the findings and draws inferences using both qualitative and quantitative approaches or methods in a single study or a program of inquiry” (Tashakkori & Creswell, 2007, p.4). Mixed methods strategies combine induction and deduction, i.e. theory verification, theory testing (quantitative methods), data exploration and theory construction (qualitative methods) (Johnson & Onwuegbuzie, 2004; Crawford et al., 2008; Teddlie & Tashakkori,

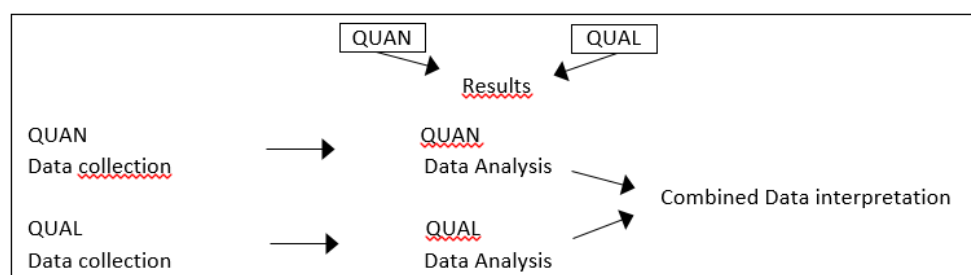
2003). Mixed methods research improves understanding of complex phenomena that are multidimensional and contextually driven, providing a multifaceted understanding of the studied issue (Greene & Caracelli, 2003).

In the paradigm debates, positivism/post-positivism versus constructivism/interpretivism, and qualitative versus quantitative research, I take a pragmatist position. The pragmatist paradigm “sidesteps the contentious issues of truth and reality, accepts, philosophically, that there are singular and multiple realities that are open to empirical inquiry and orients itself toward solving practical problems in the ‘real world’” (Feilzer, 2010, p.8). I believe that quantitative and qualitative methods are not incompatible, but are complementary and produce a more complete story of a complex social phenomenon through triangulation (Morse, 2003; Creswell et al., 2003).

‘Medicinal cannabis use’ is a complex concept that I want to explore in-depth, describe and reconstruct, by engaging participants’ perspectives. I sought to expand the understanding of medicinal cannabis use by addressing different aspects of a single phenomenon using different methods (Fetters et al., 2013). Medicinal cannabis use is a multidimensional phenomenon. For this reason, qualitative data are complemented with quantitative findings. I aim to characterise medicinal cannabis users and medicinal cannabis use, by incorporating an inductive as well as a deductive approach. Qualitative data are used to enhance understanding of quantitative findings, both having equal priority. In pragmatism, researchers primarily focus on finding an answer to an empirical question (Small, 2011). Johnson and Onwuegbuzie (2004) argue that the use of different method designs allows researchers to adopt the best opportunities for answering their specific research questions. In addition, utilising multiple methods can neutralise the limitations of certain research methods (Creswell et al., 2003).

The present study has a **concurrent triangulation design** (see **figure 1**). This means that the study utilises two methods concurrently with equal priority (Creswell et al., 2003). This design was chosen because it proves to be efficient since data are collected and analysed during the same period (Creswell & Clark, 2011).

**FIGURE 1: DIAGRAM OF CONCURRENT TRIANGULATION DESIGN**



(Creswell et al., 2003, p.236)

I constructed a mixed model design by combining qualitative and quantitative approaches across the different stages of the study. These phases include: stating the research objective and formulating the research questions, collecting the data, and interpreting the data (Johnson & Onwuegbuzie, 2004; Teddlie & Tashakkori, 2003). First, I developed a mixed methods strategy in order to answer the research

questions. For the data collection phase, this study adopts a concurrent design. This means that the two data types are collected parallel and separately, as the ordering of data collection is irrelevant (Small, 2011; Fetters et al., 2013; Creswell et al., 2003). In a next stage, the data are also analysed independently from each other. Most data are not transformed, this means that most of the qualitative data are not ‘quantitised’, nor are quantitative data ‘qualitised’ (Small, 2011; Teddlie & Tashakkori, 2003). The empirical data have been collected and analysed according to the good practices of quantitative and qualitative research. Since both methods have equal priority and the results of the methods did not depend on each other (Creswell & Clark, 2011), there was no need for one method to back up the other method. The findings from the analyses are integrated in the interpretation phase, and in the discussion and conclusion sections of the thesis (Johnson & Onwuegbuzie, 2004). In the interpretation phase, the results are integrated through narrative techniques, both qualitative and quantitative findings are presented together on a theme-by-theme basis (Fetters et al., 2013). Mixing both data types in the interpretation stage, I sought to reveal convergence, inconsistency and contradictions (Creswell et al., 2003). My analysis is expected to triangulate and to complement findings (Johnson & Onwuegbuzie, 2004).

## **2. Collecting, analysing and interpreting the data**

Similar to most user-based medicinal cannabis studies (e.g. Swift et al., 2005; Hazekamp et al., 2013), this study is cross-sectional. Data were gathered from 2016 until 2018.

### ***2.1 Preparatory work***

I entered the field before collecting data from my respondents, in order to be able to construct the data collection instruments and to expand my knowledge on the current Belgian context with regards to medicinal cannabis use. This involved conducting exploratory expert interviews, pilot interviews and testing the structured questionnaire among self-identified medicinal cannabis users. In the following sections in which these preparatory steps are described, it will become clear that already at the research design stage, when developing the data collection instruments, quantitative and qualitative phases follow one another. The findings from the pilot interviews were used to inform and supplement both data collection methods.

#### **2.1.1 Exploratory expert interviews**

In the preparatory phase of this study, exploratory talks were held with Flemish and Dutch health care professionals, and individuals who have expertise on (medical) cannabis due to their profession (N=15),

## PART III Methodology: a mixed methods approach

including: pain specialists (n=3), a neurologist, a biopharmaceutical researcher, nurses (n=2), professors (in medicine and biology) (n=2), directors of a Belgian medical cannabis patient organisation (n=2), pharmacists (n=2) and general practitioners (n=2). These interviews concerned their expertise and views on medicinal cannabis use and their practical experiences with it as part of their jobs. In essence, it is possible that all interviewees are confronted with medicinal cannabis use while practicing their profession. However, whereas some of the interviewees can be considered experts in the field of medicinal cannabis, half of the experts interviewed had little practical experience and expertise. The long search for Belgian professionals who had expertise on medicinal cannabis use, revealed that the knowledge and expertise on medicinal cannabis is still very limited in Belgium.

The expert interviews were conducted in order to develop an understanding of the current situation in Belgium with regards to medicinal cannabis use and as a first introduction to medicinal cannabis use in practice. The data derived from these interviews are not representative of medical professionals' opinions in my study, let alone in Flanders. The analyses of the interview data were explorative and are not part of the empirical results of this thesis. The expert interviews lasted between half an hour and two-and-a-half hours. When the experts gave their consent, interviews were audiotaped and were transcribed verbatim. In three of the interviews the researcher only took written notes.

### 2.1.2 Pilot interviews

After reviewing relevant literature on medicinal cannabis use and finishing the expert interviews, I conducted pilot interviews (n=5) among self-identified medicinal cannabis users with an initial draft of the topic list and interview questions. These interviews provided me with valuable information for improving the interview topics and questions posed in the qualitative in-depth interviews. After finishing the complete data collection phase of this study, I decided to treat these pilot interviews as valid responses. This means that the data from these interviews are included in the qualitative data analysis.

The pilot interviews were also valuable for constructing the quantitative data collection instrument and adapting it to the Belgian context. The content of the online questionnaire is based, first of all, on international literature. This initial version of the quantitative questionnaire was adapted based on the information gathered in the expert- and pilot interviews.

### 2.1.3 Test survey

After finishing the preliminary version of the quantitative questionnaire, which was based on existing literature and the input from the expert- and pilot interviews, it was tested among 11 self-defined medicinal cannabis users. These respondents met the inclusion criteria of the study and thus were part of the research population. Most of them filled in the online questionnaire in the presence of the

researcher (n=8). This means that they had the opportunity to ask questions and give comprehensive comments. The other respondents received the questionnaire by e-mail and they returned their comments and feedback also via e-mail (n=3). These completed draft questionnaires (n=11) were not included in the data analyses.

Apart from receiving the respondents' suggestions, the researcher was given advice on the questionnaire's content by her colleague researchers, supervisors and guidance committee. Finally, the researcher asked her friends and family to fill in the survey on the online platform, primarily to test if any technical errors occurred. After completion of the test phase, the content of the questionnaire was refined and technical improvements were made before the public launch of the online questionnaire.

## *2.2 Qualitative in-depth interviews*

The actual empirical part of this study started with conducting qualitative in-depth interviews. In total, 57 face-to-face interviews were conducted with 62 respondents from August 2016, with the start of the pilot interviews, until May 2017. Interviews took approximately between 1 and 3.5 hours of the respondents' time. All interviews were recorded with an audio recorder, in order to transcribe the interviews verbatim. By using a recorder, it was possible for the researcher to focus attentively on respondents' answers, to probe and to write down non-verbal cues and reflexive thoughts (Beyens et al., 2016; Mortelmans, 2013). When participants gave important information off tape, after the official interview, the researcher tried to write everything down afterwards, in as much detail as possible.

### *2.2.1 Interview format and setting*

The face-to-face interviews were conducted at locations of the respondents' choice. Most interviews were conducted at respondents' places of residence (n=49). The housing conditions of the respondents varied, going from small low quality (e.g. mouldy) flats in tower blocks to villas in residential areas. While some respondents' houses were decorated with symbols from the recreational cannabis culture, (e.g. reggae or cannabis plants symbols), other interiors were completely free from those. In some houses, cannabis, residues and paraphernalia were lying around, while in other houses any trace of cannabis products was absent. In several respondents' homes the smell of cannabis filled the air (n=14), because people used it inside or plants were cultivated or dried indoors. A few respondents (n=4) were smoking cannabis during the interviews. Most of the qualitative interviews that were not conducted at interviewees' homes were held in public spaces, mostly cafes (n=5). Lastly, some participants were interviewed at the researcher's home (n=3). The interviews were geographically spread and took place all over Flanders, except for one which was conducted in Wallonia.

### PART III Methodology: a mixed methods approach

The methodological literature suggests that it is preferable for an interview to be held in the sole presence of the interviewer and the respondent, in order to prevent bias (Beyens et al., 2016). The majority of the interviews were performed in this way (n=39). During other interviews, the respondents' partners, relatives or other caregivers were present in the same building or sometimes in the same room. Under these circumstances, I had to decide if it was appropriate to request the other person to leave for the duration of the interview. I had to balance the fact whether the other person would cause bias in the interview answers and whether it was comfortable for the respondent to have someone around (e.g. their caregiver). For instance, one 78-year-old participant's wife joined the interview because her husband could be confused and forgetful at times. Another interviewee who had brain damage due to a car accident asked at the start of the interview if his mother could join us. She talked about the time before and after the accident, and how the accident changed her son. Similar as found in other research, it happened that the other person dominated the interview which interfered with the answers of the interviewee (Sivell et al., 2019; Booth & Booth, 1994).

On a few occasions, those relatives who joined the interviews turned out to be medicinal cannabis users as well (n=3). In these instances, both individuals told their personal stories during the interview. At other times, a participant asked in advance if his or her partner who used cannabis for medicinal purposes as well could join the interview (n=2). When multiple individuals participated in one interview, all answers were considered to be valid data. Consequently, 57 interviews were conducted with 62 respondents.

All interviews in this study were conducted by the researcher herself. An interview guide or protocol, which consisted of standard forms, was utilised for each interview (Creswell, 2009; Beyens et al., 2016). This protocol included a document with blank space to write down reflective thoughts and a table for demographic and contextual information about the interviewee; a document with instructions for the start and the end of the interview; and a topic list with corresponding interview questions.

The interviews had a semi-structured and in-depth character. The researcher utilised a written topic and a pre-determined question list (Beyens et al., 2016). The interview questions were open-ended and encompassed a range of topics prepared in advance. The researcher based the topics and questions on the literature review conducted before the start of the fieldwork. When interviewees brought up other topics, they were encouraged to talk freely about their experiences and opinions. Since the data collection phase of qualitative methods is not fixed, the content of the interviews diverged slightly from the earlier interviews, based on the information gathered in previous interviews (Mortelmans, 2013). In semi-structured interviews participants have more control over the process and the content of the interview (Corbin & Morse, 2003), which can be empowering. However, certain interviews were dominated and directed by the interviewee, which might have led to missing valuable information.

At the start of each interview I introduced myself and informed the interviewee about the study (see 6. Ethical considerations). To open the actual interview and to break the ice (Mortelmans, 2013; Beyens et al., 2016) the researcher asked the participant to introduce him or herself. As an easy introductory question (Mortelmans, 2013), I asked the participants for which purposes they used cannabis. Other



questions posed during the interviews were more specific and focused on the following topics: patterns of (medicinal/recreational) cannabis use, motives for (medicinal/recreational) cannabis use, opinions on (medicinal/recreational) cannabis use, experienced effects, psychoactive effects, medical history and current medical condition, attitudes toward conventional and unconventional therapies and therapeutic drugs, knowledge about cannabis, third parties' opinions on cannabis use (family, friends, general practitioner, etc.) and the illegal status of cannabis.

At the end of the interviews, participants were asked if there was something they wanted to add that had not received sufficient attention during the interview (Beyens et al., 2016; Mortelmans, 2013). They were also told that they could contact the researcher any time after the interview if they wanted to add information to their interview transcripts or change particular answers that they had given during the interview. When the recorder was switched off, participants were informed about the possibility of receiving a summary of the study findings. Finally, the researcher thanked the participants for sharing their experiences and asked how they experienced the interview.

In the current study qualitative research methods were chosen to collect rich and thick description from the self-identified medicinal cannabis user perspective. A qualitative strategy is necessary for in-depth understanding and contextualisation of quantitative findings. These include questions of meaning, interpretation and socially constructed realities (Newman et al., 2003; Beyens et al., 2016). Qualitative methods enable me to answer my primarily descriptive and exploratory research questions, by applying an inductive approach (Decorte, 2016). These questions will lead to elaborate descriptions of complex social phenomena (Morse, 2003), such as medicinal cannabis use.

The instrument applied to collect useful qualitative data in the present study is the *semi-structured face-to-face interview*. This style of interview serves as an effective method for focusing on relevant data, without collecting unnecessary information since the researcher controls the setting, which can be a time-consuming activity in other types of qualitative data collection. Besides this, interviews allow the researcher to obtain historical, personal and medical information, and to uncover the participants' views, attitudes and opinions with regards to medicinal cannabis use. Since I try to unravel the meaning of the concept of 'medicinal cannabis use' through the eyes of users themselves, qualitative methods appear to be the most appropriate means to discover participants' diverse personal experiences, perspectives and opinions on this subject (Beyens et al., 2016). In this study I aim to reconstruct the subjects' realities (Creswell, 2009) regarding medicinal cannabis use.

Interviews are necessary tools for unravelling the complexity of medical cannabis use and its context. This became clear when looking at the written comments of the survey participants. At the end of the online survey, 154 of the 338 participants who finished the survey, wrote down comments. Respondents noted that particular questions were difficult to answer and they felt the need to nuance their answers. In addition, many survey respondents shared their personal story by giving extensive descriptions of their medical conditions and their personal experiences with conventional treatments and cannabis, in the comment box at the end of the survey. This illustrates that qualitative methods complement quantitative questionnaires by allowing complexity and context, both of which are limited when using

quantitative methods alone. Furthermore, this illustrates that qualitative methods are more suitable for capturing life stories.

### 2.2.2 Qualitative thematic analysis

The analysis of the qualitative interviews started with transcribing the audiotapes verbatim (Mortelmans, 2013). The majority of the interviews were transcribed by the researcher herself (n=50), the remaining were typed up by students doing their internship at my research institute (n=7). The interviews that were not transcribed by the researcher were cross-checked for accuracy and mistakes by listening to the tapes and simultaneously reading the transcripts. Transcribing interviews is known to be time-consuming. However, I decided to do it myself in order to become familiar with participants' narratives (Decorte, 2016; Mortelmans, 2013).

The qualitative data were analysed by means of the qualitative data analysis software programme NVivo 12. All interview transcripts were uploaded into this programme. Together with each transcript, demographic information on the interviewee (alias, age, gender, occupation and nationality) and the interview (place, date, interviewer and transcriber) was included. NVivo provides a standardised space for different types of data and this kind of descriptive information.

Most qualitative data were collected at the location of the interview. To provide contextual information, the researcher made field notes describing the participant (e.g. physical characteristics), the context (e.g. presence of others) and the setting (e.g. the surroundings). Ideas and thoughts that came up in the mind of the researcher during and after the interviews were equally written down as reflective notes. These reflective and field notes were included in the analyses to establish extensive, detailed and realistic descriptions (Creswell, 2009).

When transcribing, reading and coding the data, information was analysed thematically. These stages were not executed in a particular sequence but followed an iterative process (Mortelmans, 2013). In addition, the data collection and data analysis were processed simultaneously (Creswell, 2009). The interview content was adapted based on the results of the analysis of previous interviews (Mortelmans, 2013). During the initial phase of reading and coding, analytic memos and reflective notes were written down which served at a later stage as tools for creating themes and inferences based on data. Through an inductive process, by going back and forth between the themes and the database, I established my final themes (Creswell, 2009).

When coding the interview transcripts, I followed the traditional steps of open or initial coding, axial coding and finally selective coding (Decorte, 2016; Mortelmans, 2013). Deductive and inductive methods of analysis were combined. My codebook consisted of *in vivo* codes as well as codes based on theoretical concepts derived from literature (Decorte, 2016). I used a short list with predetermined (*a priori*) codes, such as 'neutralisation techniques' and 'self-control', however most codes emerged from the content of the raw interview data, such as 'recreational cannabis use patterns' and 'disclosure to

healthcare professionals.’ The codes were clustered in a code tree to connect main codes with sub codes (Mortelmans, 2013). The main codes in the code tree were used as the main themes to structure the qualitative findings in the results section of this thesis.

When analysing the interview transcripts, quantitative analysis methods were used as well. In the first place, to describe interviewees’ profiles, I counted findings that were reported by multiple participants and mentioned these counts in the results section of the thesis. It is important to note that the numbers are not representative for the sample since not all respondents received the same questions, due to the semi-structured design of the interviews. However, these numbers are mentioned in order to show emerging and recurrent themes and to illustrate that multiple voices shared similar opinions. When reporting the number of participants sharing the same characteristic, or echoing the same views, the following notation (n=x) was used in the results section.

For the analyses of the interviews I used query tools provided by NVivo to explore the data. This included the queries ‘text search’ to find out in which interviews and text segment certain words occur, and ‘word frequency’ to count the frequency of terms of interest used by interviewees and to create word clouds based on these frequencies. At the end of the survey, respondents were asked to write down any questions, comments or suggestions they had for the researcher. These responses in the comment box at the end of the survey were treated as valid data and were analysed in NVivo. Later on, a codebook was developed for the numerical count and quantitative analysis of these responses.

### *2.3 Quantitative questionnaire*

I opted for a web-based survey in this research project for the following reasons. First, the survey was designed to make inferences about characteristics, attitudes and behaviour of self-reported medicinal cannabis users (Creswell, 2009). When utilising quantitative methods, the theoretical drive is primarily deductive (Morse, 2003). Theories and hypotheses were tested in order to confirm relationships among variables that are measured numerically (Newman et al., 2003). Second, conducting online surveys is economically efficient since it is a fast method for collecting a large amount of data obtained from a widespread population. Numerical data sets obtained through surveys can also be analysed quickly by means of a statistical software programme. Finally, no sampling frame was available to sample medicinal cannabis users. In order to reach this hidden population engaged in illicit activities, an anonymous online survey served as an appropriate data collection instrument for sensitive information.

The online survey was launched in the same period as that in which the qualitative interviews were conducted. It ran for one year, from January 2017 until December 2017. The quantitative data collection instrument is an online self-administered questionnaire which ran on the online survey tool Limesurvey©. The survey consisted of closed-ended questions, rating scales, multiple choice lists and yes-no questions. In most questions, space was provided for additional textual information when participants chose the option ‘other answer’. All participants who finished the survey had the

opportunity to write down comments, remarks and suggestions at the end of the questionnaire. The survey questions were designed to be filled in and had a forced choice format. The survey was organised in a hierarchical manner, with skip logic, so that exposure to many of the items was contingent on prior responses. As a result, not all questions have the same number of responses. All reported percentages are based on the total number of responses to specific questions instead of the entire sample (Capler et al., 2017).

The survey itself is based on international literature, mostly quantitative studies that look into the characteristics of medicinal cannabis users. This enables me to compare my results with findings from previous studies. The questionnaire is also built upon internationally validated instruments, but adapted to the goal of this study. These instruments include: the Australian medicinal cannabis survey developed by the National Drug and Alcohol Research Centre, the Comprehensive Marijuana Motives Questionnaire (Lee et al., 2009) and the Short Form (36) Health Survey. I based the other questions and analyses on previous studies surveying medicinal cannabis users, by incorporating and adapting questions relevant to the current Belgian context, including: Swift et al. (2005), Shiplo (2015), Bonn-Miller et al. (2014), Lankenau et al. (2018) and Hakkarainen et al. (2015). Next, information from the pilot interviews, expert interviews and information gathered during the test phase of the survey was used to construct and revise the survey questions.

The first page of the online survey consisted of a cover letter that welcomed the respondents and presented information about the study and instructions for completing the survey. At the end of the survey, respondents were thanked for their participation. They were given the possibility to enter their e-mail address in case they were willing to be interviewed and/or when they wanted to receive summarised findings of the study. The other main content sections in this instrument included:

1. Demographic characteristics (age, gender, occupation, education level, income, nationality and marital status);
2. Medicinal cannabis use patterns and experiences (cannabis products, methods of administration, dosing, frequency of use, motives for use, substitution, effectiveness and adverse effects);
3. Medical conditions (physical and psychological symptoms, impact of cannabis on quality of life);
4. Psychoactive effects of cannabis (experiences and attitudes);
5. Recreational cannabis use (administration methods, frequency of use, dosing and attitudes);
6. Stigma and social support (attitudes of others, stigmatised feelings, behaviour and experiences);
7. Physicians (attitudes of physicians and medical supervision);
8. Health (self-reported physical and psychological health, impact of medical problems on daily activities (physical, functional, social/recreational));
9. Conventional medicines (use of conventional medicines, comparison with cannabis regarding efficacy and adverse effects);
10. Psychoactive substance use.

The questionnaire comprised 89 items in total.

### 2.3.1 Quantitative data analysis

The survey data were downloaded from the online survey tool Limesurvey© as a data file suitable for conducting analysis with the statistical programme SPSS®, version 25.

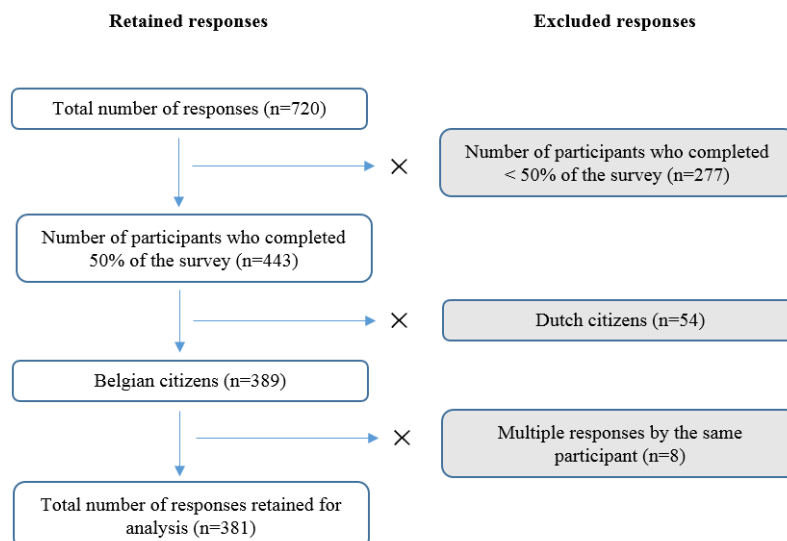
#### 2.3.1.1 Responses

From December 2017 until January 2017, the webpage of the online survey was opened 720 times in total. This number also includes people who simply logged in and who did not make it past the first question. Out of these 720 responses, 443 respondents completed at least half of the survey and 338 respondents answered all questions. I decided to retain questionnaires for analysis which were completed for at least 50% (n=443).

The data were first analysed with descriptive statistics. The results of these analyses indicated a substantial percentage of respondents of Dutch nationality who completed at least half of the questions (N=59). The research population of this study consists of Dutch-speaking people living in Belgium. I decided to delete Dutch inhabitants for most analysis and kept only Dutch-speaking respondents living in Belgium. In total, 54 respondents with Dutch nationality were removed from the sample for the majority of the analysis. Using the SPSS programme, I checked the total database for duplicates. As a result, eight responses were deleted because I suspected these came from people who had already participated in the survey.

To conclude, the database was checked for response bias with wave analysis (Creswell, 2009), but no bias was found. Participants who completed the survey did not differ from people who filled in the survey partially. After having performed these checks, 381 responses were selected for analysis. The flow diagram below (see **figure 2**) displays the respondents eligible for the study.

**FIGURE 2: FLOW DIAGRAM OF RESPONDENTS INCLUDED IN THE ANALYSIS**



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The online questionnaire was designed to be completed and was provided with a forced choice format. As a consequence, there are almost no missing item responses, except in cases when the respondent indicated a particular question did not apply ('does not apply'), not knowing the answer ('I don't know') or preferring not to answer ('prefer not to answer'). Most of the sensitive questions (e.g. income) included a 'prefer not to answer' option. Finally, for some questions participants had the possibility to answer 'other' when their own answer was not presented in the list of predetermined answers. When participants selected 'other answer' they had the possibility to write down another answer.

As mentioned above, I decided to retain questionnaires for analysis which were completed for at least 50%. As a consequence, the number of participants per question varies depending on the placement of the question.

### 2.3.1.2 Statistical analysis

The database was downloaded directly from the online survey tool Limesurvey© in the form of a SPSS file. The selected data could therefore be analysed efficiently, without creating an excessive workload. I cleaned the database, recoded a few variables and adapted the codebook to the changes made in the database. In several questions participants were given the possibility to answer 'other' and fill in a textual answer. These textual answers were recoded if they matched with the listed options, otherwise, they were left as 'other' or were left out. The actual data analysis started with a visual inspection of the database. Next, I conducted descriptive analyses in order to inspect the data for trends and distributions (Creswell & Clark, 2011).

In order to answer the research questions, I relied mainly on descriptive statistics. Bivariate analyses were used to compare the profiles, attitudes and experiences of three independent subpopulations among the self-identified medicinal cannabis users. These included: medicinal cannabis users who currently use cannabis for recreational purposes, medicinal cannabis users who have used cannabis recreationally in the past and medicinal cannabis users who have no experience with recreational cannabis use. The non-parametric Kruskal-Wallis test was used to compare the three subgroups on ratio and ordinal variables. The tests were followed by Bonferroni post hoc pair wise tests. A significance level of 0.05 was used. The Kruskal-Wallis was chosen because I compared more than two independent samples and because the assumptions of one-way ANOVA were not met (non-normal distribution).

The Pearson Chi<sup>2</sup> test was used to compare the three subgroups on categorical variables. This time the significance level was set at 0.017. This value is the quotient of 0.05 divided by the number of comparisons. Since I compared three groups, 0.05 was divided by three. A more stringent significance level is necessary in the case of multiple comparisons, because of the increased probability of incorrect rejections of the null hypothesis (i.e., Type I error). To calculate effect sizes, I used the unadjusted Odds Ratio (OR) as a measure of association when the outcome of interest was dichotomous. A 95% confidence interval was used to estimate the precision of the OR. More strict significance levels were

also used because the data were only analysed with bivariate analyses. Multivariate analyses were not conducted due to time constraints.

### ***2.4 Interpretation phase and reporting the empirical findings***

The interpretation phase consists of an in-depth study of the analyses and findings from both data sources. The quantitative and qualitative findings were integrated and interpreted together. Data interpretation involves studying the convergence of the two data sets (Creswell & Clark, 2011) and explaining the results. In part IV 'Empirical results', both the findings from the interviews and survey are detailed and extensively described. Both data types are presented together, facilitating the comparison between the findings.

When reporting the results of the interviews, illustrative quotes were added to increase transparency, to convey the researcher's interpretations, to illustrate the variety and richness of the findings and to give participants a voice. The quotes are usually followed by the participant's age, gender and a pseudonym that replaced their real name to protect anonymity. When reporting the qualitative findings, I tried to stay as close as possible to the participants' own wording. The results comprise views supported by the majority of the sample as well as minority views.

## **3. Quality of the research design**

### ***3.1 Online survey***

The quantitative questionnaire is built on the basis of international validated instruments and questionnaires used in previous studies (see 2.3 Quantitative questionnaire). The English questionnaires were translated into Dutch and adapted to the Belgian context. To increase the internal validity of the online survey, it was tested by 11 respondents prior to the public launch. These tests allowed me to check if the questions were interpreted correctly and relevant for the Belgian context. The questionnaire, including the cover letter, can be found in the appendix (see Appendix 2: Online questionnaire).

### ***3.2 In-depth interviews***

Quality criteria used in quantitative research differ from those commonly utilised in qualitative studies. Four well-known qualitative quality criteria proposed by Lincoln and Guba (1985) were used in this thesis to increase the trustworthiness of the qualitative findings, including: credibility (see 3.2.1), dependability (see 3.2.2), confirmability (see 3.2.2) and transferability (see 3.2.3). Qualitative research is not value-free. When analysing and interpreting the qualitative data, I acknowledged that my own

background, history and context play a role in the final results. During the entire research process, the researcher adopted a reflexive approach regarding these issues and tried to ensure objectivity.

### 3.2.1 Credibility

Credibility (internal validity) refers to the extent to which the study findings are true, credible, trustworthy and believable (Houghton et al., 2013; Mortelmans, 2013). The following credibility strategies were adopted: member checking, peer debriefing and methodological triangulation.

In order to achieve qualitative internal validity, I have performed member checks after the first analysis (Houghton et al., 2013; Anney, 2014; Maesschalck, 2016; Mortelmans, 2013). This involved checking with participants if they agreed with particular parts of the preliminary findings and the researcher's interpretations of their accounts, in order to eliminate researcher bias. After each interview, interviewees were asked if they were willing to give feedback and comments on summaries of the findings. Interviewees who responded positively, were sent an e-mail for feedback. Five interviewees replied, three of them gave concise responses and two interviewees provided extensive comments. After a critical examination of their feedback, the additional information from the participants was integrated and the original findings were refined. Member checks can be empowering for participants, especially when they belong to a vulnerable population whose voices are traditionally not heard (Vander Laenen & O'Gorman, 2016). When reporting the study findings, quotes from participants were often included to substantiate the researcher's interpretations and analysis.

In order to enhance the credibility of the study findings, choices with regards to the data collection methods, interview- and survey questions, data analysis procedures and the way the results were reported, were discussed thoroughly with the researcher's supervisors, the doctoral guidance committee and colleague-researchers. When coding the interview transcripts, the researcher asked one of her colleagues, a post-doctoral researcher, to cross-check the codes used in the study to establish inter-rater reliability, as a form of peer examination (Creswell, 2009; Houghton et al., 2013; Anney, 2014). Using the same coding scheme, there was a high agreement between the researcher and her colleague on the coding of the content of the interviews. When reporting the qualitative findings, I remained careful to not fall into anecdotalism (Maesschalck, 2016). During the analysis of the data I actively sought for negative or deviant cases (Anney, 2014; Maesschalck, 2016; Mortelmans, 2013). Attention was paid to opinions reported by a minority and contradictory to majority opinions, to provide alternative explanations for particular findings (Decorte, 2016).

The final credibility strategy used in this study included methodological triangulation by using a mixed methods design (Houghton et al., 2013; Anney, 2014; Maesschalck, 2016; Mortelmans, 2013). I aimed to add to the credibility of the study by triangulating the two types of data (Creswell, 2009). Many of my survey and interview findings were consistent and complimentary which increases the confidence in the credibility of the findings (Houghton et al., 2013).



### 3.2.2 Dependability and confirmability

Dependability and confirmability are qualitative equivalents of the quantitative concepts of “reliability” and “objectivity” (Mortelmans, 2013). Dependability refers to the stability of the data and confirmability to the neutrality and accuracy of the data (Houghton et al., 2013).

In order to guarantee qualitative reliability, I provided a complete audit trail by documenting all the methodological decisions made and steps taken in the research process in detail. The process of the data collection, data analysis, and interpretation of the data were presented transparently. Furthermore, I checked all the research stages for mistakes (Creswell, 2009; Houghton et al., 2013; Maesschalck, 2016). Verbatim quotes from the interviewees were frequently included in the study findings to increase dependability. This allows the reader to ascertain how the conclusions were reached.

In one of the following subsections of this methodological chapter I discuss my own background and position (Mortelmans, 2013). During the research process I reflected on how this influences the research process. In order to achieve reflexivity, I kept a reflective field journal (Houghton et al., 2013), which is commonly done in qualitative research.

### 3.2.3 Transferability

Transferability corresponds to the concepts of “external validity” and “generalisability” used in quantitative studies and refers to the degree to which the results are applicable in other contexts and settings or to other populations (Forero et al., 2018; Anney, 2014; Mortelmans, 2013). In this thesis rich and thick descriptions of the research design, study context and setting were provided. Much attention was devoted to the Belgian legal and sociocultural context. Respondents were sampled purposively (see below 4.1 Sampling methods) and the sampling methods and research subjects were described extensively. Finally, the researcher provided the reader with a clear and detailed path from the raw data to how the conclusions were reached.

## 4. Study population

The research population of this study consists of adults who claim to use currently or have used cannabis for health purposes in the past. People who participated in this study did so voluntary and were self-selected. Participants did not receive any form of compensation.

#### *4.1 Sampling methods*

In Belgium it is crucial to conduct interviews or surveys with medicinal cannabis users, since other types of information sources are simply absent. There are no legal supply sources of cannabis for medical purposes, except for Sativex® which is delivered by hospital pharmacies. Unlike other countries (e.g. Canada and the Netherlands), there are no official data available on (officially registered) patients from governmental cannabis programs, nor is it possible to gather secondary data at shops or pharmacies selling cannabis products. As a result, the majority of Belgian medical cannabis users use cannabis illegally and belong to a so-called ‘hidden population’.

Consequently, it is impossible to draw a randomised representative sample, since the total population is unknown. Therefore, a probabilistic sample cannot be derived from a sample frame. The present study does not intend to estimate the number of medicinal cannabis users living in Flanders, nor does it provide any other prevalence rates. I therefore do not claim that my results can be generalised to all medicinal cannabis users living in Flanders. This study focuses on drawing theoretical conclusions. However, inferences will be made based on the quantitative findings.

The quantitative and qualitative samples are both purposive samples drawn from the same population. This means that the samples are not randomised, but that participants who met certain criteria (see 4.2 Inclusion criteria) were recruited through convenience sampling (Kemper et al., 2003). In this study, I relied on a volunteer population because the total population is unknown and because it is affordable and efficient. However, this causes a volunteer bias (see 5. Research limitations) (Etikan et al., 2016). Another sampling method which was used in this study was snowball sampling (Mortelmans, 2013). Participants who took part in a face-to-face interview or in the online survey were asked to share the study with other potential candidates. At the end of the online survey, respondents could fill in their e-mail addresses in case they wanted to participate in a face-to-face interview. Interview participants were informed that they could participate in the survey. This means that it was possible for participants to participate in both the interviews and in the survey, in random order. A limitation of participating in both, may be that participants’ answers are biased because of repeated observations.

The sample size of the qualitative data collection is 62. This sample is much smaller than the survey’s, which amounts to 381 participants. I searched for external validity by increasing the quantitative sample size. By means of a smaller qualitative sample, I aimed to achieve in-depth understanding (Creswell & Clark, 2011). I stopped conducting qualitative face-to-face interviews when theoretical saturation was achieved (Mortelmans, 2013). The different samples sizes cause no problem because the intent of the data collection diverges (Creswell & Clark, 2011).

## 4.2 Inclusion criteria

People participating in the qualitative interviews and the online survey stem from the same research population. The inclusion criteria used in the present study included:

1. Adults ( $\geq 18$  years old);
2. Belgian residence or nationality;
3. Currently using cannabis for health purposes or having used cannabis for health purposes in the past;
4. Speak Dutch<sup>12</sup>

Since I aimed to investigate the boundaries of *medicinal cannabis use*, I decided to recruit in a broad area and used very limited inclusion criteria regarding the medical conditions of the respondents. I wanted to avoid defining in advance who complies as a ‘medicinal cannabis user’ and who does not. The goal of this study is to construct and understand this concept through the participants’ views.

This study intends to identify the characteristics of people who state that they use cannabis for medicinal purposes and how they use cannabis as a therapeutic agent. For this reason, I did not target a particular patient group, by using symptom-specific samples (e.g. MS patients), nor limit myself to people with severe physical conditions (e.g. chronic pain). Instead of targeting groups with particular medical conditions that have been proven to benefit from cannabis, I apply an inductive focus on self-reported medicinal cannabis use (i.e. the label ‘medicinal use’ is defined by the individual him/herself). Participants were not required to be prescribed nor supervised by a physician. This allows me to unravel and understand a complex continuum of user profiles, ranging from people dealing with ‘minor’ health problems to severely ill people.

## 4.3 Screening questions

All potential respondents were informed about who was expected to participate in the present study.

The study’s website and the online survey listed the study’s eligibility criteria and displayed a text with descriptive information concerning the terms ‘*cannabis*’ and ‘*cannabis use for health purposes*’. This information was provided in order for people to know whether or not they were eligible for the study and to avoid any confusion. These descriptions were based on terms used in a study on medical cannabis use patterns performed by Shiplo in 2015 in Canada (pp. 27-28). The term ‘cannabis’ was explained to the respondents as follows: “*When we use the term cannabis, we mean cannabis in all forms including herbal cannabis, oils, tinctures, hash, synthetics, cannabinoid medicines or other cannabis derivatives*

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<sup>12</sup> Due to practical reasons, the study is restricted to the Dutch-speaking region of Belgium, Flanders. Expanding it to Wallonia, the French-speaking part of Belgium, would require a French version of the survey and interviews conducted in French. Translating the instruments and data would be too expensive and time-consuming. Furthermore, the transport needed in order to conduct the face-to-face interviews would be too time-consuming and costly as well.

(e.g. *edibles, extracts*)". 'Cannabis use for health reasons' was described the following way: "*the use of cannabis for relief of health symptoms, also known as medicinal cannabis use*".

The online survey started with two questions to determine the eligibility of the participants. The first question excluded participants who were younger than 18 years old. The next question asked participants if they 'were currently using cannabis for health reasons', 'have used cannabis for health reasons in the past' or if they 'have never used cannabis for health purposes'. Individuals who chose the third option were not able to take part in the survey. When excluded, participants were shown a pop-up message that thanked them for their interest, but that they were not eligible for participation.

#### ***4.4 Recruitment methods***

The fieldwork started with conducting pilot interviews followed by the test interviews. I approached gatekeepers in order to reach respondents for these first interviews. At the time of the study, there was an operational medical cannabis social club ('Medicinale Cannabis Club VZW') as well as regular cannabis social clubs (e.g. 'Trekt uw plant'), whose members also include medicinal users. Next, one interest group on medicinal cannabis use ('MEDCAN vzw') was active at the time of the study. This non-profit association disseminated information on medicinal cannabis use and claimed to have over 300 members who used cannabis for medicinal purposes. The owners of these organisations and other (medicinal) cannabis activists were approached as gatekeepers to help me get in touch with medicinal cannabis users.

At a later stage, I recruited people via references from medical cannabis advocates and by snowball referrals. Respondents were primarily recruited through non-institutionalised settings, since the aim was to recruit respondents from a broader setting than mere medical institutions (e.g. hospitals). At first, the researcher relied on her own professional network in order to recruit respondents. Cannabis social clubs located in Flanders were later on approached in order to disseminate the study among their members. In addition, I tried to recruit respondents by means of the snowball sampling technique. The study participants were asked in person or by e-mail if they knew others who were willing to participate in the study and if they were willing to share the study with those potentially interested.

As a form of digital strategy, I decided to promote the study on online media. The study was announced on the social media platform Facebook by creating a Facebook page, and I set up a temporary website for the study. Recruiting respondents through Facebook appeared to be very successful. Calls for participation posted on the study's Facebook page were shared 220 times and reached about 35,000 people. The study was also promoted via Facebook by means of paid advertisements. The study's website served mainly to inform people about the goal of the study and how to participate.

An additional internet-based strategy for recruiting respondents for the in-depth interviews involved the online survey itself. At the end of this questionnaire, it was possible for participants to fill in their e-mail addresses in case they were interested in participating in a personal interview. This recruitment strategy

appeared to be successful as 240 respondents filled in their e-mail addresses. The researcher contacted all these respondents, but had to inform the majority that the interview could not take place because of the overwhelming response. Most of the interviewees were recruited by means of this approach.

My digital strategy equally consisted of disseminating the study through internet sites, including specialised cannabis user/grower/buyer websites, Facebook groups, fora and websites about cannabis activism (e.g. 'ENCOD'). Since many medicinal cannabis users start using cannabis because of dissatisfaction with their conventional medicines, I posted my study on websites or fora concerning alternative medicines and therapies (e.g. 'e-gezondheid'). Since the prevalence of medicinal cannabis use is higher among certain patient populations (e.g. MS patients), I tried to reach them by contacting gate keepers, clinics, patient support groups (e.g. 'Nationaal Multiple Sclerose Centrum v.z.w'). In addition, I posted the study on discussion sections of specialised websites (e.g. 'Chronische pijn forum').

Finally, flyers were designed and disseminated at relevant locations (e.g. doctors' offices). The flyers mentioned the organisations responsible for the study, the funding agency, the study's purpose and what participation involved for respondents. By presenting the study's website and Facebook page on the flyer, respondents were able to find additional information about the study online. The flyer also had a QR-code, which led directly to the study's website.

One of the greatest challenges in social research is to convince respondents to participate in the study. Given the sensitivity of this particular topic, a lot of time and energy was spent on building trusting relationships with potential participants and on a personal approach of utilising gatekeepers.

## 5. Research limitations

In this section I identify the main limitations of my thesis and explain the importance of each of these limitations.

Firstly, when relying on self-reports it is difficult to verify whether respondents tell the truth or not, and social desirability bias cannot be ruled out. Secondly, the online questionnaire is limited by the impossibility for controlling the circumstances in which the survey is completed. Although the survey starts with two eligibility questions, it is impossible to prevent participation by people who do not meet the inclusion criteria (e.g. people who have never used cannabis). Multiple responses from a single respondent are equally possible. However, when a respondent was suspected to have filled in the survey more than once, I excluded one of his/her responses. I was also not able to give instructions during the survey, nor could I help respondents in case they did not understand or misinterpreted questions. When the survey was activated, I received a few comments concerning the formulation of questions. These comments indicated that survey questions can be interpreted differently or can even be misinterpreted. This means that the results from particular survey questions have to be interpreted carefully.

I expected selection bias in this study because of the use of purposive sampling methods and the chosen recruitment methods. Firstly, it is possible that the online questionnaire did not reach particular populations because of the lack of internet access. Elderly people for example may have less access to the internet. Secondly, it is possible that severely ill people were less likely to participate in this study due to their health problems. Thirdly, since people participate voluntarily and are self-selected, it is likely that the non-response is not coincidental which causes volunteer bias (or self-selection bias) (Etikan et al., 2016). First of all, the illegal status of cannabis and the social stigma associated with it could discourage certain populations from participating. Next, because this study looks into users' experiences with medicinal cannabis use, it is very likely that people who stopped using cannabis because of dissatisfaction -because of side effects and/or inefficacy- are underrepresented. The study probably attracts participants who have positive attitudes about cannabis use and thus are highly motivated to participate. As a consequence, the research findings may be biased towards positive experiences with regards to the therapeutic efficacy and safety of cannabis, whereas health risks and adverse effects might be minimised. Although this study is not designed to evaluate the effectiveness of cannabis, results should still be interpreted cautiously because of this possible bias. A further limitation of the current study is the impossibility of corroborating the findings with other official data sources.

Because of the limitations of the sampling and recruitment methods, I cannot guarantee that the sample is representative for the entire self-identified medicinal cannabis population living in Flanders. The cross-sectional nature of the study does not allow (causal) inferences and restricts the generalisations that can be made from the data. Prospective and longitudinal studies, relying on types of data other than self-reports, are needed to corroborate these retrospective self-reported insights.

## **6. Ethical considerations**

This ethical section focuses in on the study's ethical approval and the measures that were taken to protect the participants and the researcher.

### ***6.1 Ethical approval***

This doctoral research project is financed by the agency FWO (Research Foundation-Flanders). There are no potential conflicts of interest to declare. The funding agency for this project was displayed on its website, flyers and the welcome page of the survey in order to establish trust and credibility (Creswell, 2009). All participants were informed about the independence of the research project (Vander Laenen & O'Gorman, 2016).

In order to obtain ethical approval for this research project, we filled in an application form for advice from the Ethical commission of the Faculty of Law and Criminology of Ghent University. This

commission gave their provisional approval, but concluded that ethical approval for this study should be obtained from the ethical commission of the faculty of Medicine and Health Sciences because of the study's medical parts. Therefore, we submitted the ethical dossier to the Commission for Medical Ethics of Ghent University. During the application process for ethical approval from the Commission for Medical Ethics we received the following comment: *“The members of the commission comprehend that people will be interviewed about illegal activities. You have explained that this is a frequent “problem” in your discipline [criminology], but that confidentiality is always ensured. The members wonder if this is sufficient. It is the opinion of the members that the researchers are obligated to inform the authorities when they are aware of illegal activities.”* By giving a comprehensive plea about the common practices in criminological research, the impossibility of doing research when all offences have to be reported, and the absence of the legal obligation to report certain crimes as a citizen, the commission accepted that minor offences should not be communicated to law enforcement and should not be adopted in the ethical protocol. Eventually, the study obtained ethical approval from the Commission for Medical Ethics of the Faculty of Medicine and Health Sciences of Ghent University. All respondents were informed about the ethical approval.

## ***6.2 Measures protecting the participants***

At the start of the survey and the interviews, participants were fully informed about the study's goals, the funding agency, the researchers involved, the topics addressed during the interview and in the survey, the way results were published, the rights of participants and the duties of the researcher (Mortelmans, 2013). They were guaranteed full anonymity and confidentiality. Each participant was given the opportunity to ask additional information about the research project (Vander Laenen & O’Gorman, 2016).

Individuals participating in the online survey were informed that when they started the questionnaire by clicking the button ‘next’, they were assumed to be at least 18 years old, to have been informed about the aims of the research project, to know that participation was voluntary and that they could end the survey at any time. In this way, participants gave their consent by starting the survey.

Participants in the face-to-face interviews were provided with written and verbal information about the study's objectives, possible advantages and disadvantages of participating in the interviews, study participants' rights and the content and format of the interview (Vander Laenen & O’Gorman, 2016; Mortelmans, 2013). Interviewees were told that participation was voluntary, they could ask questions related to the research project, their data were processed confidentially and anonymously, and they could end the interview at any time without having to give a reason (Vander Laenen & O’Gorman, 2016). Interviewees were never asked to sign an informed consent form with their signature or name, as is required in many studies (Coomber, et al., 2003). Instead, respondents gave their oral approval and written approval by marking a checkbox on the informed consent form. The participant received a copy

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of this document (see Appendix 3: Informed consent). Asking only for verbal consent is done more often in research into illegal activities, to avoid criminal prosecutions.

The interviewees were asked for permission to record the interview and the researcher explained why this was desirable (Beyens et al., 2016). All interviewees consented to the recording of the interviews. Participants were informed about what happened with the tape during and after the study. A few respondents asked to pause the tape recorder when they did not want to talk about particular topics when the tape recorder was on. Others indicated not wanting to admit particular illegal activities during the interview, possibly because it would be documented on tape. To protect my respondents from legal risks amongst others, I guaranteed their anonymity. Participants were told that their names and other personal details were not revealed in the study's publications.

Measures were put in place to ensure that participants' identities and personal information remained confidential. Interview notes, questionnaires and audiotapes were stored securely. All data collected (both interviews and questionnaires) were encrypted or password protected and saved on a computer which is inaccessible to unauthorised persons. To protect identities, respondents' names and other personal data that could identify participants, places or other individuals, were transformed into pseudonyms or were left out in the data analysis phase. To protect participants' anonymity, the audio recordings and the corresponding interview transcripts were given a number, unique for every interview. In a secured and encrypted file, the respondents' real names were linked to the unique numbers (Vander Laenen & O'Gorman, 2016). All data were stored on the personal server of the Faculty of Law and Criminology of Ghent University during the completion of the research project. After completion of the research, these files will be destroyed. The results of the research or any resulting statistics will not be made available in a form that identifies participants.

This research involves a hidden vulnerable research population because of their illicit cannabis use and their chronic health conditions. As a result, careful measures were taken before moving on to the data collection phase in order to protect and respect the participants. Given the central topic of this study, the risk of disclosure of self-incriminating information exists. Those who currently use cannabis medicinally do so illegally and they have to obtain cannabis from illicit sources and experiment with self-medication, without the supervision of a medical professional. All information provided in the interviews as well as in the questionnaire is part of a confidential relationship between the participant and the researcher. As a result, a trusting relationship was established between the interviewee and the interviewer. The researcher is not legally obliged to inform judicial instances of any illegal activities mentioned by the participants (see above 6.1 Ethical approval).

Questions in the study were linked to the societal and political debate on clinical trials with medical cannabis and on a legal framework in Belgium, given the former developments within the Federal Agency for Medicines and Health Products (FAMHP). At the same time, the inclusion of sensitive questions about (undiagnosed) medical conditions, medical history, contact with medical facilities, attitudes towards and use of (non-)conventional medicines, and knowledge about therapeutic efficacy might provoke feelings of unease. Before the face-to-face interviews, participants were duly informed



about the research goal and the possibility to skip questions if they felt uncomfortable answering them. The interviewer equally paid attention to any kind of feelings of discomfort and addressed them immediately. Overall, interviewees did not show signs that they were upset, except for one interviewee. A twenty eight-year-old man started crying during one of my interviews, when he was talking about his mother who was heavily addicted to prescription drugs and alcohol.

The interviews might also have been relieving and empowering for the participants. Interviewees noted feeling grateful and excited that the study was being conducted and that they could take part in it. Some hoped that the study findings would help in changing the current illegal context (cf. Decorte et al., 2019) and that sharing their experiences would help other people in similar situations. Corbin and Morse (2003) suggest that interviews are more often beneficial than harmful. Other researchers have argued that participants value the non-judgemental environment and having someone to listen to their stories, which can be empowering and even therapeutic (Sanders et al., 2014; Corbin & Morse, 2003).

Since the current study concerns medical cannabis use, many respondents were dealing with physical health problems. Four patients suffered from severe pain or discomfort during the qualitative interviews. When looking back on those interviews it might have been better to end them sooner. The interviewees were asked multiple times if it was alright to continue and they responded positively. However, it was clear that they were in pain. Similar to the study of Shaw (2003), which involved participants with health issues as well, I had to decide if it was appropriate to continue the interview on that day or to re-schedule it. Bahn and Weatherill (2013), argue that this quick decision making, which involves balancing generating research output versus protecting the participant, causes internal tension in the researcher.

### *6.3 Measures protecting the researcher*

There exists a large amount of literature on the risks of research for the respondents and how to protect participants' wellbeing (Corbin & Morse, 2003). Recently, there is growing literature on the emotional challenges that researchers face in qualitative studies and measures they may take to protect themselves (Bahn & Weatherill, 2013; Mckenzie et al., 2017; Rager 2005; Coles & Mudaly, 2010; Moncur, 2013). Multiple authors call for formal guidelines, support and training in order to protect researchers when doing fieldwork (Bloor et al., 2010; Rager, 2005; Mckenzie et al., 2017). They recommend reflective journals, peer debriefing, periods of time-out, personal counselling, support networks, professional supervision, member checking and maintaining balance to cope with emotions during qualitative research (Rager, 2005, McKenzie et al., 2017; Coles & Mudaly, 2010). There are a few criminological publications that address the emotional impact of fieldwork in criminological areas (e.g. Beyens et al., 2013). The consequences of conducting sensitive research are much more thoroughly documented in health-related research (e.g. Hess, 2006).

Multiple scholars stress the importance, while preparing emotionally-laden qualitative studies, of anticipating harm to respondents and researchers (Mckenzie et al., 2017; Rager, 2005). Corbin and

### PART III Methodology: a mixed methods approach

Morse (2003) suggest that it is important for qualitative researchers to be trained and have the skills to recognise signs of distress within respondents and to act upon them. My personal and professional background did not provide me with tools to cope with my own and respondents' vulnerability. I am educated as a criminologist. In the four-year program of Criminological sciences, I gained mainly theoretical knowledge on performing qualitative and quantitative research. I prepared the fieldwork and the data analysis by following methodological courses, including multiple statistical courses, courses on questionnaire construction and analysis, and a course on qualitative data analysis with Nvivo. Before the start of this research project, I had little experience with qualitative interviewing in practice. In addition, I was not trained how to perform research with vulnerable populations, such as patients and marginalised populations. Furthermore, students in criminology are inexperienced in interacting with these populations unlike students in nursing, psychology or medicine. On the other hand, an advantage of not being a medical expert is that the researcher is not biased and respondents can speak freely (Sivell et al., 2019). Multiple respondents in this study turned out to have had negative experiences with conventional medicine, and as a social scientist I was able to disassociate myself from the entire healthcare industry.

Booth and Booth (1994) and Dickson-swift et al. (2007) reported that researchers felt exhausted after emotionally challenging interviews with vulnerable participants. Overall interviewing seriously ill people made me feel upset, empty and emotionally drained at the end of the day. More often, the personal narratives of the respondents concerned multi-problems. Most of the interviews took place across a span of four months without any long periods of time-out. In addition, more often than not, two interviews were scheduled on the same day. These times were filled with conversations about illnesses and their impact on life. Being surrounded by stories about diseases caused fears with regards to my own vulnerabilities, similar to what Moncur (2013) describes as *the increased sensitisation to your own mortality* and McKenzie et al. (2017) as a *heightened sense of the fragility of life*, the empirical part of this study changed me personally in my perceptions on health and treatments.

Not only gathering data was emotionally demanding, also other parts of the study, including transcribing and reading the transcripts, evoked emotional responses. In qualitative research it is important to write down field notes about the context and the setting. It is equally important to document one's honest feelings and reflective thoughts during the different research stages. Doing this taught me more about my data and added to the interpretation of the data. Keeping a field diary or a research journal with reflective notes helped me as a researcher to deal with emotional responses and personal challenges in a systematic way (Rowling, 1999; Punch, 2012). In addition, keeping track of perceived successful interviews and failures during fieldwork gave me better insights into the research project. Punch (2012) and Sanders et al. (2014) show how emotions can be integrated into and enhance the data analysis process and are valuable sources of knowledge. My own emotions made me comprehend the despair and vulnerability of the interviewees and why they take the risks to choose for an illegal treatment that is socially unaccepted and medically contested. I was able to understand the seriousness and far-reaching implications of using illicit treatments.

Professional counselling for researchers doing sensitive fieldwork is not explicitly offered at my university. Unstructured informal debriefing with peers (Bahn & Weatherill, 2013, Rager, 2005) was one self-care strategy adopted during this research project. Dickson-Swift et al. (2007) argue that informal peer support is especially important when the university does not provide counselling or professional supervision for researchers. It turned out to be important for me to talk to others about the sensitive subjects that came up during the interviews which were particularly moving. Co-workers were around for me to share my thoughts and to reflect on them together. They were familiar with the research project and they knew when my interviews were scheduled. Furthermore, they had similar experiences in qualitative research. These conversations made me realise that my own feelings and experiences should not be neglected in this thesis and led to the writing of this section.

## Conclusions

This methodological chapter discussed step-by-step how the current study was conducted in order to address the research questions.

The first section outlined the epistemological underpinnings of the study. The study has a mixed methods design and involves the separate and parallel collection and analysis of quantitative and qualitative data. It adopts pragmatism as a research paradigm. The following subsection described the data collection and analysis methods. It first explained in detail the preparatory steps taken prior to the actual field work, which included exploratory expert interviews, pilot interviews and testing the online survey. The empirical data were gathered with face-to-face semi-structured in-depth interviews (n=62) and a structured online questionnaire (n=381). The qualitative data were thematically analysed with qualitative data analysis software. Using a statistical software package, the quantitative data were analysed with descriptive and bivariate methods of analysis. The qualitative and quantitative findings were interpreted and reported together in the discussion sections of this thesis.

The subsequent section focused in on the quality of the research methods. For the qualitative methods this included outlining four quality criteria commonly used in qualitative research. The subsection that followed provided a detailed description of the study population. It started by outlining the sampling design, followed by a discussion of the inclusion criteria, the screening questions and the recruitment methods used in the present study. Thereafter, the most critical limitations of the current study were presented. This methodological chapter closed with ethical concerns and considerations. This included the measures taken to protect the participants and the researcher, and a brief description of the ethical approval of the present study.

# PART IV

## Empirical results

### Introduction

Part IV of this thesis provides an empirical discussion of the results obtained and analysed with the methods outlined in part III. This part organises and reports the study's main findings, including the presentation of relevant quantitative (statistical) and qualitative (narrative) data. The purpose of this part is to provide a comprehensive picture of self-identified medicinal cannabis use based on user experiences, which are reported in six thematic chapters. These chapters cover: medicinal cannabis users' profiles (1); self-reported effects (2); cannabis use patterns (3); cannabis use motives (4); conventional and alternative medicine (5); and social acceptance and stigma (6).

Very little is known about the diversity within the self-claimed medicinal cannabis users population with regards to their profiles and purposes for use. Therefore, this study examines the similarities and differences between the characteristics of exclusively medical cannabis users and non-exclusively medical cannabis users. This means that I compare medicinal cannabis users who use cannabis exclusively for medical purposes with medicinal cannabis users who report concomitant recreational cannabis use and medicinal cannabis users who have used cannabis for recreational purposes in the past. In the analyses survey participants were divided into three mutually exclusive subgroups, based on the following statements presented in one of the questions in the survey: '*I currently use cannabis for recreational purposes*' (1), '*I have used cannabis for recreational purposes in the past, but no longer*' (2) and '*I have never used cannabis for recreational purposes*' (3). The self-identified medicinal cannabis users were categorised as follows: 'current recreational users' (n=184; 50.97%) (1), 'previous recreational users' (n=96; 26.59%) (2) and 'exclusively medicinal users' (n=81; 22.44%) (3). These three independent subgroups are compared on different variables measured in this study.

All chapters in this part start with a short introduction to the topic analysed in the respective chapter. The first section of each chapter presents the results of the analyses of the survey data and the second section elaborates on the results from the qualitative interviews covering the same topic. After these two results sections, the findings from both collection instruments are discussed and interpreted together to unravel contradicting and confirming findings. The results are linked to each other as well as to the existing literature. The general conclusions of the empirical findings will be discussed in the next part of the thesis.

# Chapter 1

## Medicinal cannabis users' profiles

### *Introduction*

Self-identified medicinal cannabis users are a hidden population in Belgium due to the illegal status of cannabis. In this introductory chapter I explore the profiles of Flemish self-identified medicinal users and compare their profiles with those of the general population. It is important to remain cautious about comparisons with the general population, since the study sample is not randomised and therefore it cannot be claimed that it is representative.

The first section of the survey results present the sociodemographic characteristics of the survey participants (see 1.1). For the interviews, this includes a short overview of interviewees' sociodemographic profiles, covering age and gender. Interviewees' sociodemographic characteristics were discussed briefly during the interviews (see 2.1). The second sections of the survey and interview results focus on participants' licit and illicit drug use. Previous research suggests that cannabis is used as a substitute for licit as well as illicit drugs (Boehnke et al., 2019; Lau et al., 2015; Lucas et al., 2013; Lucas et al., 2016; Reiman, 2009). Therefore, particular attention in these sections will be paid to cannabis substitution (see 1.2 and 2.2).

The following subsections detail participants' health. They explore participants' medical conditions and symptoms, and their self-reported health (see 1.3 and 2.3). The interview findings will elaborate on psychological health problems, given the complexity of self-medicating with psychoactive substances for mental health problems and its risks. The final sections of this chapter finish with participants' cannabis careers. It focusses on motivations to quit using cannabis and medicinal cannabis users' first introduction to cannabis (see 1.4 and 2.4).

In the discussion of this chapter the study participants' profiles are compared to findings on medicinal cannabis users' profiles from previous studies.

## 1. Survey results

### 1.1 Sociodemographic characteristics

Survey questions on sociodemographic characteristics covered gender, age, nationality, marital status, education level, employment status and income. The results are summarised in **table 1** below. The average age of medicinal cannabis users in this study was 40 (SD=11.8; range from 19 to 76) with almost a quarter (n=85; 22.5%) over 50 years old. The majority were male (n= 236; 61.9%) and had Belgian nationality (n=365; 96.6%). The majority had at least a diploma in secondary education (n=275; 78%). Most of the survey participants had a partner (n=235; 63%) of whom a quarter was married (n=92; 24.7%).

Consistent with previous research findings (Reinarman et al., 2011; Zaller et al., 2015), participants' education level did not deviate from the general population and they were much more likely to be unemployed (Statbel, 2018). The percentage of people with a non-Belgian nationality that participated in the survey is slightly lower than the proportion of people with another nationality living in Flanders (3.4% vs 8.4%) (Noppe et al., 2018).

There was an overrepresentation of men in the survey sample (61.9%). Scholars of a similar study conducted in the US have reported possible explanations about why this overrepresentation might exist. First, men would be more likely to have certain injuries (e.g., workplace, sports, and motorcycle accidents). Second, they would be less stigmatised for using drugs than women (Reinarman et al., 2011). This result is linked to previous study findings that suggest that recreational cannabis users are more likely to be male than female (Gisle, 2014). Earlier studies show that medicinal cannabis users often have experience with recreational cannabis use (Walsh et al., 2013; Reinarman et al., 2011; Lucas & Walsh, 2017; Ware et al., 2005).

There were slightly more survey participants unemployed than employed (51.8% vs 48.2%). Unemployment was mainly due to disabilities (n=122; 66.3%) (see **figure 3**). Other respondents were retired, students, homemakers or looking for a job. Of the people who were employed (n=175), almost seventy percent worked full time. This percentage is slightly lower than the number found in the general population (73.2%) (Statbel, 2018). The household income category that was selected most frequently covered the range of €1000 to €1999. The household income of the survey sample was relatively low, as half (51%) of the survey participants indicated having a household income lower than €2000 per month.

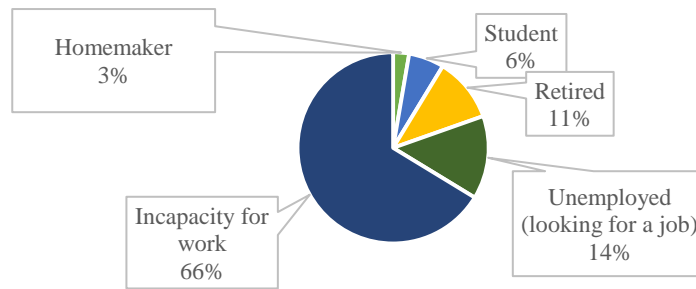
**TABLE 1: SOCIODEMOGRAPHIC CHARACTERISTICS OF THE SURVEY SAMPLE**

	N	%
<b>Gender (n=381)</b>		
Female	145	38.1
Male	236	61.9
<b>Age (range 19-76) (n=377)<sup>a</sup></b>		
Mean (SD)	40	(11.79)
18-30	83	22.0
31-40	119	31.6
41-50	90	23.9
51-60	64	17.0
61-70	19	5.0
71-80	2	0.5
<b>Nationality (n=378)<sup>b</sup></b>		
Belgian	365	96.6
Dutch	5	1.3
Other	8	2.1
<b>Marital status (n=373)<sup>c</sup></b>		
Single	112	30.0
Living together with a partner	102	27.3
Married	92	24.7
In a relationship, but not living together	41	11.0
Divorced/no longer living together with a partner	22	5.9
Widowed	4	1.1
<b>Highest degree (n=353)<sup>d</sup></b>		
No diploma	14	4.0
Primary education	64	18.1
Secondary education	170	48.2
Bachelor	69	19.6
Master or higher	36	10.2
<b>Employment status (n=367)<sup>e</sup></b>		
Employed	177	48.2
Unemployed	190	51.8
<b>Working time (n=175)<sup>f</sup></b>		
Full-time	121	69.1
Less than full-time, but more than half-time	28	16.0
Half-time	21	12.0
Less than half-time	5	2.9
<b>Unemployment status (n=184)<sup>g</sup></b>		
Incapacity for work	122	66.3
Unemployed (looking for a job)	20	10.9
Retired	26	14.1
Student	11	6.0
Homemaker	5	2.7
<b>Total net household income per month (n=347)<sup>h</sup></b>		
No income yet	11	3.2
Less than €1000	35	10.1
€1000 to €1999	142	40.9
€2000 to €2999	76	21.9
€3000 to €3999	58	16.7
€4000 or more	25	7.2

<sup>a</sup>Four missing answers. <sup>b</sup>Three participants selected the option 'I prefer not to answer'. <sup>c</sup>Eight participants selected the option 'I prefer not to answer'. <sup>d</sup>20 participants selected the option 'I prefer not to answer' and eight participants selected the option 'other'. <sup>e</sup>14 participants selected the option 'I prefer not to answer'. <sup>f</sup>This question was only shown to participants who said they were employed in a previous question (n=177). Two participants selected the option 'I prefer not to answer'. <sup>g</sup>This question was only shown to participants who said they were unemployed in a previous question (n=190). Three participants selected the option 'I prefer not to answer' and three participants selected the option 'I don't know'. <sup>h</sup>11 participants selected the option 'I don't know' and 23 participants selected the option 'I prefer not to answer'.

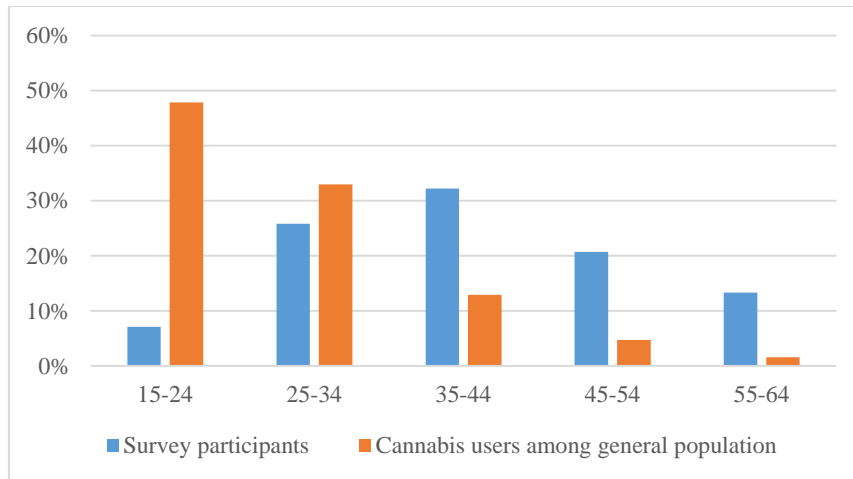


**FIGURE 3: UNEMPLOYMENT STATUS OF SURVEY PARTICIPANTS (N=184)**



The present findings suggest that the sociodemographic profile of self-identified medicinal cannabis users participating in this study differs from the profile of Belgian recreational cannabis users, regarding age and gender. The percentage of women in this sample is higher compared to the percentage found in previous studies that assessed lifetime and past twelve months cannabis use among the general Belgian population (Drieskens et al., 2014; EMCDDA, 2018a). Among the survey population the largest age group was 35-44, whereas the largest age group among people who have used cannabis during the past twelve months found among the general Belgian population was 15-24 (Gisle, 2014) (see **figure 4**).<sup>13</sup>

**FIGURE 4: COMPARISON OF SURVEY PARTICIPANTS' AGE WITH THE AGE OF PEOPLE WHO HAVE USED CANNABIS DURING THE PAST TWELVE MONTHS AMONG THE GENERAL BELGIAN POPULATION**



Source: Gisle (2014)

I looked for differences in sociodemographic characteristics across the three subsamples of the survey participants, which were divided based on their experience with recreational cannabis use. These results show that relationship status, education level and household income were not significantly different between the three subgroups. Exclusively medicinal cannabis users were significantly older (med=49) than previous recreational users (med=38;  $p<0.001$ ) and current recreational users (med=38;  $p<0.001$ ).

<sup>13</sup> In the present study only adults were eligible to participants, which means we have no numbers for those aged between 15 and 17 years, which limits the comparability.

There were significantly more females among the exclusively medicinal cannabis users (69.1%) than in the former recreational group (44.8%), and the current recreational group (21.2%). Both exclusively medicinal cannabis users and previous recreational users were less likely to be employed than current recreational cannabis users (see appendix 1, **table 1a**).

## 1.2 Drug use

The survey participants were asked to select from a structured list of licit and illicit psychoactive substances those substances that they have used at least once. Multiple drugs could be cited. If participants selected a psychoactive substance from the list, they had to indicate if they had used it in the past twelve months.

The data show that the majority of the survey sample have used the licit substances alcohol (n=267; 78.5%) and tobacco (n=250; 73.5%) in their lifetime. Over half of the survey sample have smoked tobacco (53.8%) and drank alcohol during the past twelve months (57.1%) (see **table 2**). Self-identified medicinal cannabis users reported higher rates of smoking cigarettes compared to the Belgian population (lifetime and past year use) (GfK, 2018), but alcohol consumption rates were lower for the past twelve months (Möbius & De Donder, 2017). Higher prevalence of tobacco use and lower prevalence of alcohol consumption were also found in other studies examining medicinal cannabis users' profiles (Grella et al., 2014; Reinerman et al., 2011).

**TABLE 2: SURVEY PARTICIPANTS' SUBSTANCE USE (LIFETIME AND PAST TWELVE MONTHS) (N=340)\***

	Lifetime substance use		Past twelve months substance use	
	N	%	N	%
Alcohol	267	78.5	194	57.1
Cigarettes (tobacco)	250	73.5	183	53.8
Cocaine	125	36.8	26	7.6
MDMA	110	32.4	21	6.2
Psilocybin	110	32.4	32	9.4
Amphetamine	106	31.2	12	3.5
LSD	97	28.5	18	5.3
Tranquilisers for non-medical use	52	15.3	16	4.7
Ketamine	43	12.6	9	2.6
Heroin	25	7.4	0	0.0
GHB	23	6.8	3	0.9
Other opioids for non-medical use	18	5.3	7	2.1
Methamphetamine	13	3.8	1	0.3
Synthetic cannabinoids	11	3.2	2	0.6
Methadone	8	2.4	2	0.6
<b>Use of illicit psychoactive substances other than cannabis</b>	166	48.8	66	19.4
<b>Number of illicit psychoactive substances, mean (SD)</b>	1.97	(2.54)	0.37	(0.96)

\*N=340, because 41 participants did not answer these questions because they did not complete the survey entirely.

Almost half of the respondents (n=166; 48.8%) have used an illicit drug alongside cannabis during their lifetime, with an average of about two illicit substances per participant (SD= 2.54). More than a quarter of the sample have used the following illicit substances at least once: cocaine (36.8%), MDMA (32.4%), psilocybin (32.4%), amphetamine (31.2%) and LSD (28.5%). About one-fifth of the participants (n=66; 19.4%) have used an illicit drug other than cannabis in the past twelve months, mostly psilocybin (9.4%) cocaine (7.6%) and MDMA (6.2%) (see **table 2**). The prevalence of lifetime illicit drug use among medicinal cannabis users exceeded the prevalence in the general population (EMCDDA, 2018;<sup>14</sup> Gisle, 2014) (see **table 3**).

**TABLE 3: LIFETIME DRUG USE IN THE STUDY SAMPLE VS GENERAL POPULATION IN THE EUROPEAN UNION (%)**

	Study sample	European Union
Cocaine	36.8	5.1
MDMA	32.4	4.1
Amphetamines	31.2	3.6

Source: EMCDDA (2018), *European Drug Report 2018: Trends and Developments*, Publications Office of the European Union, Luxembourg.

I have found significant differences with regards to drug use between participants who have experience with recreational cannabis use and participants without. Exclusively medical users were less likely than both other subgroups to have used legal as well as illegal drugs in their lifetime. While two third of the current recreational group (67.8%) and about half of the previous recreational group (52.4%) have ever used an illegal drug other than cannabis, this only accounts for 5.3% of the exclusively medical group (see **table 4**). One third of the exclusively medicinal cannabis group (32%) have smoked cigarettes in the past twelve months; this was almost double for the previous recreational (58.3%) and current recreational group (62.2%).

<sup>14</sup> Only for the substances about which prevalence rates were available on the level of the European Union: Cocaine, MDMA and Amphetamines

**TABLE 4: SURVEY PARTICIPANTS' LIFETIME SUBSTANCE USE (COMPARISONS BETWEEN THE THREE SUBGROUPS)**

	Exclusive medical (N=75)		Previous recreational (N=84)		Current recreational (N=171)	
	N	%	N	%	N	%
Alcohol	41	54.7 <sup>a,b</sup>	69	82.1 <sup>a</sup>	151	88.3 <sup>b</sup>
Cigarettes (tobacco)	33	44.0 <sup>a,b</sup>	70	83.3 <sup>a</sup>	142	83.0 <sup>b</sup>
LSD	1	1.3 <sup>a,b</sup>	27	32.1 <sup>a</sup>	69	40.4 <sup>b</sup>
Cocaine	1	1.3 <sup>a,b</sup>	37	44.0 <sup>a</sup>	86	50.3 <sup>b</sup>
Amphetamines	2	2.7 <sup>ab</sup>	29	34.5 <sup>a</sup>	74	43.3 <sup>b</sup>
Methamphetamines	0	0.0	5	6.0	8	4.7
MDMA	2	2.7 <sup>a,b</sup>	27	32.1 <sup>a</sup>	80	46.8 <sup>b</sup>
GHB	0	0.0	10	11.9	13	7.6
Heroine	1	1.3 <sup>a</sup>	9	10.7	15	8.8 <sup>a</sup>
Psilocybin	1	1.3 <sup>a</sup>	24	28.6 <sup>a</sup>	84	49.1 <sup>a</sup>
Methadone	0	0.0	3	3.6	5	2.9
Ketamine	2	2.7 <sup>a,b</sup>	14	16.7 <sup>a</sup>	27	15.8 <sup>b</sup>
Synthetic cannabinoids	1	1.3	1	1.2	9	5.3
Other opioids	1	1.3	2	2.4	15	8.8
Tranquilisers	1	1.3 <sup>a,b</sup>	12	14.3 <sup>a</sup>	39	22.8 <sup>b</sup>
<b>Ever use of illicit psychoactive substances other than cannabis</b>	4	5.3 <sup>a</sup>	44	52.4 <sup>a</sup>	116	67.8 <sup>a</sup>
<b>Number of illicit psychoactive substances Mean, (SD)</b>	0.15	(0.94) <sup>a,b</sup>	2.21	(2.78) <sup>a</sup>	2.75	(2.54) <sup>b</sup>

<sup>a,b</sup> groups with the same superscript differ significantly from each other at a  $p < 0.05$  tested using a Kruskal-Wallis test for ratio variables and post hoc pair wise tests Bonferroni. The Chi<sup>2</sup> test was used for nominal variables using a significance level of  $p \leq 0.017$ .

### 1.2.1 Substitution

I presented my participants with a list of substances that can be substituted with cannabis, which included medicines, alcohol, cigarettes and other illegal drugs (e.g. LSD, cocaine, etc.). Participants were asked if they ever replace these partially or completely with cannabis, and multiple substances could be cited. Including in the list of answer options, participants also had the possibility to select the answer '*I never use cannabis instead of other substances*'.

Consistent with other studies, respondents substituted cannabis for other substances, mainly prescription medication (Reinarman et al., 2011; Lucas & Walsh, 2017; Nunberg et al., 2011). Medicines were replaced partially or completely by cannabis by slightly more than half of the sample ( $n=200$ ; 52.5%), followed by alcohol ( $n=45$ ; 11.8%) and cigarettes (tobacco) ( $n=41$ ; 10.8%). Only 5.5% reported using cannabis in place of other illicit psychoactive substances. 38.1% of the respondents ( $n=145$ ) reported never using cannabis as a substitute for other substances (see **table 5**).

Exclusively medical cannabis users were more likely to use cannabis instead of other medicines compared to current recreational users. They were less likely to substitute alcohol and cigarettes with cannabis (see **table 5**).

**TABLE 5: SURVEY PARTICIPANTS WHO REPLACE OTHER SUBSTANCES (PARTIALLY OR COMPLETELY) WITH CANNABIS**

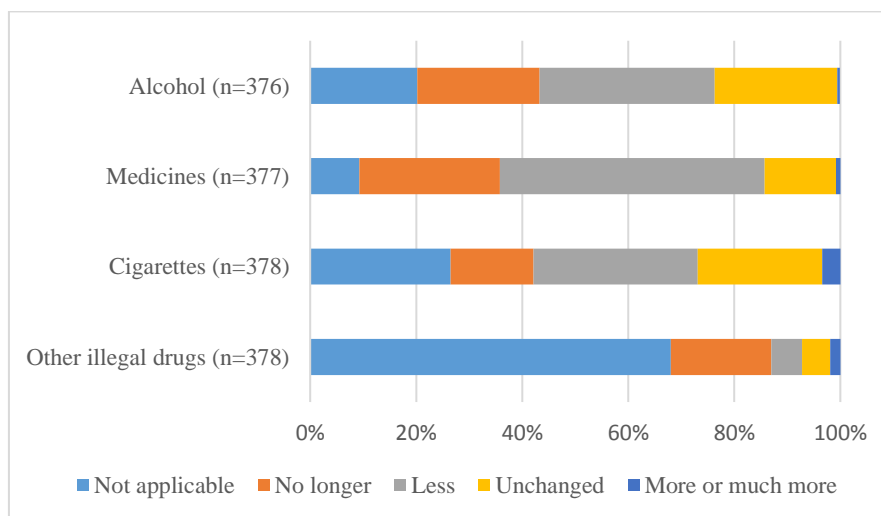
	Total (N=381)		Exclusive medical (N=81)		Previous recreational (N=96)		Current recreational (N=184)	
	N	%	N	%	N	%	N	%
Medicines	200	52.5	54	66.7 <sup>a</sup>	54	56.3	89	48.4 <sup>a</sup>
Not using cannabis as a substitute	145	38.1	24	29.6	36	37.5	73	39.7
Alcohol	45	11.8	1	1.2 <sup>a</sup>	5	5.2 <sup>b</sup>	38	20.7 <sup>a,b</sup>
Cigarettes (tobacco)	41	10.8	1	1.2 <sup>a</sup>	8	8.3	29	15.8 <sup>a</sup>
Other illegal drugs	21	5.5	1	1.2	2	2.1	16	8.7

<sup>a,b</sup> groups with the same superscript differ significantly from each other at a significance level of  $p \leq 0.017$ , tested using Chi<sup>2</sup> test. Totals exceed 100% because multiple responses could be cited.

To assess the influence of self-identified medicinal cannabis users' cannabis use on other drug use patterns, I asked participants about the frequency of their use of other psychoactive substances since they started using cannabis. Participants had to indicate on a Likert scale if they used medicines, alcohol, cigarettes and other illegal drugs 'no more', 'less', 'the same', 'more' or 'much more' since the start of their cannabis use. I also gave the answer option 'I don't know'. When participants had never used a particular substance they were asked to select 'not applicable' (see **figure 5**).

Participants indicated that since they were using cannabis, their use patterns of other substances have changed. Three quarters (n=288; 76.4%) reported using less or no more medicines since they started using cannabis. About half drink less alcohol (n=211; 56.1%) and smoke fewer cigarettes (n=176; 46.6%). The majority indicated never using other illicit drugs (n=257; 68%) and about a quarter reported using less illicit drugs since the start of their cannabis use (24.8%) (see **figure 5**).

**FIGURE 5: CHANGE IN SURVEY PARTICIPANTS' USE PATTERNS OF OTHER SUBSTANCES SINCE THE START OF THEIR CANNABIS USE**



N varies because participants did not answer these questions because they did not complete the survey entirely, and because participants chose the answer option 'I don't know'.

### 1.3 Medical conditions and symptoms

Participants were asked whether or not they used cannabis for a particular medical condition (e.g. depression, MS, etc.). The great majority of the total sample ( $n=316$ ; 82.9%) said that they did (see **table 6**). These participants had to select the conditions for which they used cannabis from a predetermined list of 56 medical conditions (see **table 7**). In a separate question, all participants were asked to identify the symptoms for which they used cannabis from a predetermined list of 61 symptoms (see **table 10**). Participants were not asked to choose their primary medical condition nor a primary symptom, instead they could select multiple conditions and symptoms. Participants were also given the possibility to add other conditions and symptoms to the two lists. During the analyses I divided all medical conditions and symptoms into psychological and physical categories in order to determine if cannabis was mainly used for physical or psychological health purposes.

**TABLE 6: SURVEY PARTICIPANTS' MEDICAL CONDITIONS AND SYMPTOMS**

	Total (N=381)	Exclusive medical	Previous recreational	Current recreational
<b>Conditions</b>				
Uses cannabis for a medical condition, n (%)	317 (83.2)	71 (87.7)	84 (95.5)	150 (89.3)
Uses cannabis for a psychological condition, n (%)	192 (50.4)	24 (34.3) <sup>a,b</sup>	53 (63.1) <sup>a</sup>	108 (72.0) <sup>b</sup>
Uses cannabis for a physical condition, n (%)	275 (72.2)	67 (95.7) <sup>a</sup>	74 (88.1)	123 (82.0) <sup>a</sup>
<b>Number of medical conditions per participant, mean (SD)</b>				
Psychological conditions, mean (SD)	1.30 (1.50)	0.56 (0.99) <sup>a,b</sup>	1.29 (1.44) <sup>a</sup>	1.67 (1.64) <sup>b</sup>
Physical conditions, mean (SD)	2.41 (2.09)	2.87 (2.04) <sup>a</sup>	2.54 (2.36)	2.17 (1.95) <sup>a</sup>
<b>Symptoms</b>				
Uses cannabis for a psychological symptom, n (%)	310 (81.4)	44 (54.3)	77 (80.2)	171 (92.9)
Uses cannabis for a physical symptom, n (%)	327 (85.8)	70 (86.4)	81 (84.4)	159 (86.4)
<b>Number of symptoms per participant, mean (SD)</b>				
Psychological symptoms, mean (SD)	4.60 (4.75)	1.81 (3.19)	4.72 (4.97)	5.80 (4.86)
Physical symptoms, mean (SD)	2.95 (2.74)	3.11 (2.88)	2.76 (2.55)	3.04 (2.82)

<sup>a,b</sup> groups with the same superscript differ significantly from each other at a  $p < 0.05$  tested using a Kruskal-Wallis test for ratio variables and post hoc pair wise tests Bonferroni. The Chi<sup>2</sup> test was used for nominal variables, at a significance level of  $p \leq 0.017$ .

#### 1.3.1 Conditions

Multiple medical conditions per participant was the norm, with an average of 3.71 conditions per respondent ( $SD=2.61$ ). On average, participants selected about one psychological condition ( $SD=1.50$ ) and two physical conditions ( $SD=2.09$ ) for which cannabis was used (see **table 6**). Consistent with previous research, I found that chronic pain ( $n=175$ ; 55.4%) was the most reported condition. Other commonly reported conditions were sleep disorders ( $n=108$ ; 34.2%), depression ( $n=93$ ; 29.4%), ADHD/ADD ( $n=53$ ; 16.8%) and arthritis ( $n=49$ ; 15.5%). Other conditions were cited by less than 15% of the sample. In total, participants cited 55 different conditions, these are displayed in **table 7**.

**TABLE 7: SURVEY PARTICIPANTS' CONDITIONS WHICH THEY TREAT WITH CANNABIS (N=316)\***

	N	%
Chronic pain	175	55.4
Sleep disorder	108	34.2
Depression	93	29.4
ADHD/ADD	53	16.8
Arthrosis	49	15.5
Arthritis/Rheumatism	49	15.5
Fibromyalgia	47	14.9
Migraine	36	11.4
Injury caused by accident	34	10.8
Persistent muscle spasms	33	10.4
Auto-immune disease	31	9.8
Postoperative injury	30	9.5
Social anxiety	28	8.9
PTSD	27	8.5
Drug abuse/dependence	26	8.2
Generalised anxiety disorder	23	7.3
ME/CFS	23	7.3
Neuropathy	22	7.0
Skin disorders	20	6.3
Asthma	18	5.7
Multiple sclerosis	18	5.7
Bipolar disorder	17	5.4
Cancer	16	5.1
IBS/Crohn's disease	16	5.1
Hypertension	15	4.7
Chronic Lyme	14	4.4
Allergy	11	3.5
Head trauma	11	3.5

\*N=316, because this question was only shown to participants who indicated on a previous question using cannabis for a particular condition. Totals exceed 100% because multiple responses could be cited.

Other n<10 of total sample, (n): lung disorder (9), weight loss (9), epilepsy (9), Tourette syndrome (9), specific anxiety disorder (9), hernia (8), persistent nausea (7), ulcerative colitis (7), autism (7), carpal tunnel syndrome (7), osteoporosis (6), diabetes (5), PMS (5), incontinence (5), schizophrenia (5), opiate addiction/dependence (4), paraplegia (4), sclerosis (3), OCD (2), glaucoma (2), anorexia (2), hepatitis C (2), HIV/aids (2), dystonia (1), ALS (1), cachexia (1), Parkinson's disease (1).

Among the exclusively medical users, participants reported less psychological conditions per participant ( $\bar{x}$ =0.56) than respondents who had used cannabis recreationally in the past ( $\bar{x}$ =1.29,  $p$ =0.001) and respondents who currently use recreationally ( $\bar{x}$ =1.67,  $p$ <0.001). Exclusively medicinal users reported a slightly higher number of physical conditions per participant ( $\bar{x}$ =2.87) than current recreational cannabis users ( $\bar{x}$ =2.17) ( $p$ =0.016) (see **table 6**). However, the differences between the subgroups were small. The table below ranks the ten most reported medical conditions per subgroup.

**TABLE 8: RANKING OF THE TEN MOST REPORTED MEDICAL CONDITIONS PER SUBGROUP**

	<b>Exclusive medical</b>	<b>Previous recreational</b>	<b>Current recreational</b>
1.	Chronic pain	Chronic pain	Chronic pain
2.	Fibromyalgia	Sleep disorder	Sleep disorder
3.	Arthrosis	Depression	Depression
4.	Sleep disorder	ADHD/ADD	ADHD/ADD
5.	Arthritis/Rheumatism	Arthrosis	Arthritis/Rheumatism
6.	Persistent muscle spasms	Fibromyalgia	Injury caused by accident
7.	Auto-immune disease	ME/CFS	Migraine
8.	Postoperative injury	Arthritis/Rheumatism	Drug abuse/dependence
9.	Migraine	Auto-immune disease	Social anxiety
10.	Multiple sclerosis	Persistent muscle spasms	PTSD

Participants were asked if their conditions were diagnosed. For each condition participants could select if it was diagnosed by the following people: (1) medical doctor or medical specialist, (2) other medical professional, (3) alternative health practitioner, (4) friend, and (5) self-diagnosed. For the analysis only the first category was coded as ‘diagnosed by a physician’, whereas the other options were merged into ‘not diagnosed by a physician’ (Hakkarainen et al., 2015). Almost four in five (78.6%) of the survey participants’ medical conditions were diagnosed by a physician.

A higher number of exclusively medical cannabis users’ medical conditions were diagnosed by a physician in comparison with those among the two other subgroups (see **table 9**).

**TABLE 9: PHYSICIANS’ DIAGNOSIS OF MEDICAL CONDITIONS AMONG SURVEY PARTICIPANTS**

	<b>Total (N=312)*</b>	<b>Exclusive medical (N=70)</b>	<b>Previous recreational (N=83)</b>	<b>Current recreational (N=147)</b>
Total number of conditions, N	1176	241	320	576
Number of conditions diagnosed by a physician, N (%)	924 (78.6)	212 (88.0)	256 (80.0)	425 (73.8)

\*N=312, because this question was only shown to participants who indicated on a previous question using cannabis for a particular medical condition (n=316). Four participants selected the option ‘other answer’.

### 1.3.2 Symptoms

The most selected medical conditions corresponded with the most reported symptoms for which cannabis was used by the survey participants. These included chronic pain (61.9%), sleep problems (53.8%) and feeling depressed or sad (41.7%) (see **table 10**). The median number of symptoms per respondent was six, with slightly more psychological ( $\bar{x}$ = 4.60) than physical symptoms ( $\bar{x}$ = 2.95) (see **table 6**). However, the mode for psychological symptoms was equal to zero and two for physical symptoms.



**TABLE 10:** SURVEY PARTICIPANTS' SYMPTOMS FOR WHICH THEY USE CANNABIS (N=381)

	N	%
Chronic pain	236	61.9
Sleep problems	205	53.8
Feeling depressed/sadness	159	41.7
Stress	150	39.4
Nervousness	137	36.0
Inflammations	128	33.6
Restlessness	102	26.8
Anxiety	92	24.1
Acute pain	87	23.6
Stiffness	86	22.8
Spasms/fasciculation	81	21.3
Anger	75	19.7
Hyperactivity/excessive energy	64	16.8
Fatigue/low energy	63	16.5
Mood swings	61	16.0
Panic/panic attacks	58	15.2
Social anxiety	58	15.2
Nightmares, night terror or night sweats	57	15.0
Attention or concentration problems	57	15.0
Decreased appetite	56	14.7
Loneliness	55	14.4
Feeling helpless or hopeless	48	12.6
Not enjoying hobbies or other activities	46	12.1
Vomiting/nausea	45	11.8
Numbness/tingling	43	11.3
Muscle weakness	41	10.7
Compulsive behaviour or thoughts	39	10.2
Feeling worthless	34	8.9
Craving for alcohol or drugs	32	8.4
Phobias/intense fears	29	7.6
Breathing problems	28	7.3
Difficulties in making decisions	26	6.8
Feeling overwhelmed	26	6.8
Memory problems	24	6.3
Feeling guilty or ashamed	24	6.3
Gastric acid	24	6.3
Decreased sex drive or libido	21	5.5

Totals exceed 100% because multiple answers could be selected.

Other n<20 of total sample, (n): feeling confused (19), bloating/flatulence (17), tremor/tremble (17), suspicion/distrust (17), diarrhoea (16), constipation (15), psychoses (15), increased appetite (14), dizziness/vertigo (14), eczema (13), increased heartrate/palpitations (13), frequent urination (12), seizures (12), frequent crying (12), vision or eye problems (12), tinnitus (11), itching (10), hallucinations/delusions/bizarre thoughts (10), stuttering/stammering (8), acne (7), elevated intraocular pressure (6), incontinence (3), fainting (3), impotence (2).

Exclusively medicinal cannabis users reported a significant lower number of symptoms per respondent ( $\bar{x}$ = 4.93) compared to both other subgroups ( $\bar{x}$ = 7.48;  $\bar{x}$ = 8.85). The two recreational subgroups selected more psychological symptoms, but no more physical symptoms (see **table 6**). The table below (**11**) presents the ten most reported symptoms per group.

**TABLE 11:** RANKING OF THE TEN MOST REPORTED SYMPTOMS PER GROUP

	Exclusive medical	Previous recreational	Current recreational
1.	Chronic pain	Chronic pain	Chronic pain
2.	Sleep problems	Sleep problems	Sleep problems
3.	Inflamations	Feeling depressed/sadness	Stress
4.	Spasms/fasciculation	Stress	Feeling depressed/sadness
5.	Stiffness	Nervousness	Nervousness
6.	Fatigue/low energy	Inflamations	Inflamations
7.	Acute pain	Restlessness	Restlessness
8.	Nervousness	Anxiety	Anxiety
9.	Numbness/tingling	Spasms/fasciculation	Anger
10.	Feeling depressed/sadness	Nightmares, night terror or night sweats	Acute pain

### 1.3.3 Self-reported health

To measure participants' self-reported health, they were asked to rate their health on a Likert scale going from 'poor', 'fair', 'good', 'very good' to 'excellent'. The greater part of the sample described their health as fair (33.8%) or poor (22.0%), the other part rated their health as good or better than good. Out of this latter group only 4.5% said that their health was excellent (see **table 12**).

**TABLE 12:** SURVEY PARTICIPANTS' SELF-REPORTED HEALTH

	Total (n=337)*		Exclusive medical (N=76) <sup>a</sup>		Previous recreational (N=85) <sup>b</sup>		Current recreational (N=168) <sup>a,b</sup>	
	N	%	N	%	N	%	N	%
Excellent	15	4.5	2	2.6	0	0.0	13	7.7
Very good	39	11.6	5	6.6	6	7.1	28	16.7
Good	95	28.2	14	18.4	27	31.8	51	30.4
Fair	114	33.8	33	43.4	30	35.3	49	29.2
Poor	74	22.0	22	28.9	22	25.9	27	16.1

\*N=337, because 38 participants did not answer this question because they did not complete the survey entirely and because six participants selected the option 'I don't know'.

<sup>a,b</sup> groups with the same superscript differ significantly from each other at a p<0.05 tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni.

A standardised self-report measurement model was used to measure physical functioning and emotional well-being. This was the shortened version of the standardised Rand SF-36 Questionnaire, available in Dutch (SF-36) (Van der Zee & Sanderman, 2012). The SF-36 questionnaire measures current perceived health status. Out of the SF-36 questionnaire two out of the eight subscales were selected (Young et al., 2005); the physical functioning scale (10 items)<sup>15</sup> and the emotional well-being scale (5 items)<sup>16</sup>. On each subscale scores range from 0 to 100, with lower scores reflecting poorer health and higher scores

<sup>15</sup> **Physical functioning scale:** the items in this scale are about activities one might do during a typical day. Participants had to indicate if their health limited these activities. Possible answers were: Yes, limited a lot (1), yes limited a little (2) and no, not limited at all (3). The ten items included: **a.** Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports; **b.** Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf; **c.** Lifting or carrying groceries; **d.** Climbing several flights of stairs; **e.** Climbing one flight of stairs; **f.** Bending, kneeling, or stooping; **g.** Walking more than a mile; **h.** Walking several blocks; **i.** Walking one block; **j.** Bathing or dressing yourself

<sup>16</sup> **Emotional well-being scale:** The items in this scale are about how someone feels and how things have been with them during the past four weeks. For each item participants had to indicate on a 6 point Likert scale ranging from 'all of the time' to 'none of the time' the way they have been feeling. The five items included: "How much of the time during the past four weeks . . ." **a.** Have you been a very nervous person? **b.** Have you felt so down in the dumps that nothing could cheer you up? **c.** Have you felt calm and peaceful? **d.** Have you felt downhearted and blue? **e.** Have you been a happy person?

better health (a score of zero is equivalent to maximum disability and a score of 100 is equivalent to no disability) (Young et al., 2005). The mean score on the SF-36 scale measuring physical functioning was 68.10, and 63.07 for emotional well-being (see **table 13**). These scores are lower than those found among the general population (Van der Zee & Sanderman, 2012; Bayingana et al., 2004).

Exclusively medicinal cannabis users and former recreational users rated their health as less good ( $p < 0.01$ ) and had significantly lower scores on physical functioning compared to current recreational cannabis users ( $p < 0.001$ ). For emotional well-being there were no significant differences between the three subgroups' scores (see **table 12** and **table 13**).

**TABLE 13: SURVEY PARTICIPANTS' PHYSICAL FUNCTIONING AND EMOTIONAL WELL-BEING**

	<b>Total</b>	<b>Exclusive medical</b>	<b>Previous recreational</b>	<b>Current recreational</b>
<b>Physical functioning, mean (SD)<sup>1</sup></b>	<b>N=319*</b> 68.10 (28.82)	<b>N=69</b> 53.91 (29.80) <sup>a</sup>	<b>N=80</b> 62.8 (27.50) <sup>b</sup>	<b>N=163</b> 76.9 (26.00) <sup>a,b</sup>
<b>Emotional well-being, mean (SD)<sup>2</sup></b>	<b>N=341**</b> 63.07 (19.86)	<b>N=75</b> 65.76 (20.50)	<b>N=85</b> 60.89 (20.30)	<b>N=172</b> 62.91 (18.90)

\*N=319, because 40 participants did not answer these questions because they did not complete the survey entirely, and because 22 responses were missing because respondents answered 'I don't know'.

\*\* N=341, because 40 participants did not answer these questions because they did not complete the survey entirely.

<sup>1</sup>The SF-36 physical health score is a continuous measure from 0–100 where 100 is perfect physical functioning.

<sup>2</sup>The SF-36 mental health score is a continuous measure from 0–100 where 100 is perfect emotional well-being.

<sup>a,b</sup> groups with the same superscript differ significantly from each other at a  $p < 0.05$  tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni.

## 1.4 Cannabis careers

At the start of the survey, participants were asked whether they were still using cannabis for medicinal purposes or had ended their use. Participants who selected the latter option were asked to select reasons for quitting their cannabis use from a structured list. Multiple answers could be cited.

Only a small proportion ( $n=30$ ; 7.9%) of my total sample have ended their medicinal cannabis use. This means that nearly all were using cannabis for health purposes at the time of the survey. The main reasons for participants to stop using cannabis were the inability to obtain supply ( $n=11$ ; 42.3%), concerns regarding law enforcement ( $n=8$ ; 30.8%) and because people no longer needed cannabis because their complaints were relieved ( $n=6$ ; 23.1%). Only a few participants ended their use because of ineffectiveness ( $n=2$ ; 7.7%) and adverse effects ( $n=2$ ; 7.7%) (see **table 14**).

**TABLE 14: LIFETIME CANNABIS USE**

	N	%
<b>Still using cannabis (n=381)</b>		
Yes	351	92.1
No, I have used cannabis in the past but not anymore	30	7.9
<b>Reasons for quitting cannabis use (n=26)*</b>		
Inability to obtain supply	11	42.3
Concerns for law enforcement	8	30.8
No longer needed because complaints were gone	6	23.1
Unaffordable	4	15.4
Negative reactions from others	3	11.5
Concerns for losing job	3	11.5
Ineffectiveness	2	7.7
Adverse effects	2	7.7
Deteriorating effects on health	1	3.8

\*N=26, because this question was only shown to participants who indicated having stopped using cannabis in a previous question (n=30). Six participants selected the option 'other'. Totals exceed 100% because multiple responses could be selected.

I asked participants at what age they used cannabis for the first time (for whatever reason), and at what age they used cannabis medicinally for the first time (see **table 15**).

The median age when participants used cannabis for the first time in their lives was 17 years old (range=11-75) and 29 for using cannabis for the first time for health purposes (range=12-75), echoing previous research findings (Walsh et al., 2013). The median age of my participants when using cannabis for the first time is the same age found in the Health Interview Survey (HIS) from 2013 among the general Belgian population. This survey also found a median age of 17 (Gisle, 2014).<sup>17</sup>

The median age difference between using cannabis for the first time in general and using cannabis specifically for health purposes for the first time was four years. Based on this age-difference I found that the majority of the participants had used cannabis before they started using it for health purposes (n=238; 64.7%). The average period of using cannabis among the participants was nine years (SD=8.87), with 52.4% using cannabis for over five years (see **table 15**).

Exclusively medicinal users were significantly older when using cannabis for the first time ( $\bar{x}$ =42.4) than both other subgroups ( $\bar{x}$ =18.59 and  $\bar{x}$ =17.75) ( $p<0.001$ ). They were also using cannabis for a significantly shorter period at the time of the study ( $p<0.001$ ) (see **table 15**).

<sup>17</sup> The Health Interview Survey (HIS) is a periodically-organised study that assesses the health status of the Belgian population and identifies their main health problems. One of the indicators to measure health in this study is illegal drug use. The latest reports date from 2013, as the results from the survey conducted in 2018 are not available yet.

**TABLE 15: SURVEY PARTICIPANTS' AGE OF FIRST USE CANNABIS**

	<b>Total (n=375)*</b>	<b>Exclusive medical (n=76)</b>	<b>Previous recreational (n=92)</b>	<b>Current recreational (n=180)</b>
Age first use cannabis, mean (SD)	23.33 (13.41)	42.40 (14.20) <sup>a,b</sup>	18.59 (6.30) <sup>a</sup>	17.75 (6.80) <sup>b</sup>
Median	17	43	16	16
Age first use cannabis for health purposes, mean (SD)	31.64 (13.45)	43.63 (13.90) <sup>a,b</sup>	30.47 (12.30) <sup>a</sup>	27.19 (10.30) <sup>b</sup>
Median	29	44	28	25
Age difference between first use cannabis and first use for health purposes, mean (SD)	8.14 (9.92)	1.62 (6.51) <sup>a,b</sup>	11.07 (11.19) <sup>a</sup>	9.41 (9.18) <sup>b</sup>
Median	4	0	8	6
Number of years using cannabis, mean (SD)	9.09 (8.87)	4.49 (7.63) <sup>a,b</sup>	8.94 (7.77) <sup>a</sup>	11.23 (9.26) <sup>b</sup>
Median	6	2	6	8

\* N=375, because six responses are missing.

<sup>a,b</sup> groups with the same superscript differ significantly from each other at a p<0.05 tested using a Kruskal-Wallis test for ratio variables and post hoc pair wise tests Bonferroni. The Chi<sup>2</sup> test was used for nominal variables, at a significance level of p≤0.017.

Using a multiple choice question, I asked participants what convinced them to start using cannabis for health purposes. Nearly sixty percent (n=224) reported having experienced the beneficial effects themselves during recreational cannabis use. The second most reported reasons for starting to use cannabis medicinally are hearing about it in the media (e.g. internet, TV or magazine) (n=165; 43.3%) and reading about it in a scientific article (n=163; 42.8%). Almost forty percent (n=149) of the total sample indicated that nothing else relieved their symptoms. Only one in seven (n=53) said that cannabis was suggested by a physician. Results show that most of the time multiple reasons convinced respondents to start using cannabis for health purposes (see **table 16**).

**TABLE 16: SURVEY PARTICIPANTS' MOTIVES FOR INITIAL USE**

	<b>Total (N=381)</b>		<b>Exclusive medical (n=80)</b>		<b>Previous recreational (n=95)</b>		<b>Current recreational (n=184)</b>	
	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>
Experienced the beneficial effects during recreational cannabis use	224	58.8	10	12.5 <sup>a</sup>	59	62.1 <sup>a</sup>	145	78.8 <sup>a</sup>
Have heard/read about it in the media	165	43.3	44	55.0 <sup>a</sup>	43	45.3	69	37.5 <sup>a</sup>
Have read about it in a scientific article	163	42.8	32	40.0	30	31.6 <sup>a</sup>	92	50.0 <sup>a</sup>
Nothing else relieved symptoms	149	39.1	34	42.5	44	46.3	66	35.9
It was suggested by other users/patients	87	22.8	18	22.5	21	22.1	45	24.5
It was suggested by friends, family or acquaintances	58	15.2	16	20.0	14	14.7	26	14.1
It was suggested by a physician	53	13.9	19	23.8 <sup>a,b</sup>	11	11.6 <sup>a</sup>	20	10.9 <sup>b</sup>
It was suggested by another medical professional	39	10.2	13	16.3	7	7.4	19	10.3

<sup>a,b</sup> groups with the same superscript differ significantly from each other at a significance level of p≤0.017, tested using Chi<sup>2</sup> test. Totals exceed 100% because multiple responses could be cited.

## PART IV Empirical results: chapter 1

Current and previous recreational cannabis users selected having experienced the beneficial effects during recreational cannabis use more often than the exclusively medical respondents ( $p < 0.001$ ). Current recreational users reported more often that they read about cannabis in a scientific article in comparison with previous recreational users. Finally, there were more participants among the exclusively medical group who were advised by their physician to use cannabis compared to current and previous recreational users, however this was still a small number of participants (see **table 16**).

## 2. Interview results

### 2.1 Sociodemographic characteristics

In total sixty-two self-identified medicinal cannabis users participated in the in-depth interviews. The number of men and women participating were equal (n=31). All participants were adults, and their age varied between 21 and 78. Only one respondent was older than seventy. The mean age of the interviewees was 46 years old, which is slightly higher than the average age found in the survey sample ( $\bar{x}=40$ ). The largest age group was 51 to 60 years (see **table 17**).

**TABLE 17:** AGE CATEGORIES OF INTERVIEWEES (N=62)

Age categories	N
21-30	8
31-40	15
41-50	13
51-60	18
61-70	7
71-80	1
<b>Total</b>	<b>62</b>

The majority of interviewees were unemployed (n=42), mainly because of disabilities. Other unemployed participants were students, retired or homeworkers. The education level of most respondents was unknown.<sup>18</sup> An impaired health status was many times not the only problem interviewees were dealing with, more often they found themselves in multi-problems situations. All of them violated the law by possessing, buying, importing and/or cultivating cannabis and had to live with the consequences (e.g. internal and external stigma, fear of arrest, etc.). A few of my participants were living in poverty. More often, they lived in socially deprived circumstances and were socially isolated. Ten interviewees said spontaneously that they had few friends and other social encounters, because of their disease or other circumstances (e.g. poverty).

### 2.2 Drug use

#### 2.2.1 Alcohol (ab)use

A subset of respondents (n=12) reported that they had abused alcohol in their past (e.g. dependence and binge drinking). Some of them self-medicated with alcohol to cope with physical or mental problems, for which they currently used cannabis. **Sandra (42)**, living with ADHD, said that she used to be drunk

<sup>18</sup> This subject was not discussed during the interviews.

almost every evening so as not to be reminded of the traumatic experience of being sexually abused as a child. Self-medicating with alcohol for mental and physical health problems was considered problematic (i.e. an escape), whereas using cannabis was not. Four respondents suffering from severely chronic pain noted that alcohol anaesthetised their physical pain completely. Two of them stated that they had abused alcohol because of this reason. **Tom (37)** was hospitalised multiple times because of acute alcohol intoxication.

*I: “You told me that you don’t drink a lot of alcohol?”*

*R: “No, not anymore. In the past, I have been addicted to alcohol because of its numbing effect on pain. I drank almost a bottle of vodka a day. I have quit that and now I drink one or two glasses per month, for instance when we go out for dinner.” [Tom/M/37]*

All participants who reported having alcohol problems in the past, claimed not to have them anymore at the time of the interviews. Some of them believed that cannabis played a role in this through substitution. A frequently recurring item during the interviews, were respondents who mentioned that their alcohol consumption had decreased or ceased since the start of their cannabis use. Many no longer felt the need to drink alcohol, because cannabis induced relaxation. Even some of the participants who claimed never using cannabis for non-medical purposes observed that their alcohol consumption had reduced. More often, interviewees did not deliberately drink less alcohol, but it happened spontaneously.

A group of respondents reported that cannabis and alcohol were incompatible. The experience of using the two substances together was not enjoyed. Others hardly or never drank alcohol because of their medical conditions. Some stopped drinking alcohol because the substance affected them strongly and negatively in general, or in combination with other medicines. Another reason for avoiding alcohol were respondents who had drinking problems in the past or who had relatives with drinking problems.

### 2.2.2 Illicit drug use

While most respondents had no experience with illegal drug use other than cannabis, almost a quarter (n=14) of the interviewees said they had used illicit drugs when they were younger. A few of them stated that they self-medicated with illicit drugs for mental health purposes (e.g. amphetamines for ADHD), for which they currently used cannabis. Others experimented with illicit drugs or used them regularly in a recreational context in their youth. Most interviewees labelled their past illicit drug use as problematic. Two participants were hospitalised due to overdoses and quit their use after these incidents. **Sabine (51)** thought that her mental and physical tensions were due in part to abusing illicit drugs in her youth, alongside other traumatic events and overwork as a journalist. She argued that since she was seeing a psychologist and used cannabis oil therapeutically, she finally felt calm and balanced.

**Roger (53)**, who had an alternative lifestyle, was the only interviewee still using illicit drugs at the time of the interviews. He used LSD and psilocybin mushrooms once or twice per year for his cluster headaches, alongside his regular cannabis use. He stated that psychedelic substances such as LSD were



more effective than cannabis for his cluster headaches, but at the same time were also more intense. When he took LSD he was unable to function and had to isolate himself for a day or two.

### 2.3 Medical conditions and symptoms

Most interviewees were dealing with comorbid chronic conditions and were living with complex health problems. Their most important medical conditions are listed in the table below (see **table 18**). This long list illustrates, in accordance with the quantitative section of this study, that cannabis is used for a wide variety of physical as well as mental health indications.

**TABLE 18: MEDICAL CONDITIONS OF THE INTERVIEWEES (N=62)**

<p><b>Mental health disorders</b>  depression (8)  insomnia (13)  attention deficit hyperactivity disorder (ADHD) (3)  personality disorder (3)  posttraumatic stress disorder (PTSD) (2)  schizophrenia  bipolar disorder  burnout  Charles Bonnet syndrome</p>	<p><b>Cancer</b>  lung cancer (3)  breast cancer (2)  skin cancer  prostate cancer  thymic cancer  salivary gland cancer</p>
<p><b>Skin disorders</b>  psoriasis (3)  eczema (3)  acne  morphea  necrosis</p>	<p><b>Neurological disorders</b>  multiple sclerosis (MS) (3)  spinal cord injury (2)  cluster headaches  neuromuscular disorder  muscular dystrophy (MD)</p>
<p><b>Digestive disorders</b>  irritable bowel syndrome (IBS) (5)  stomach disease (2)  ulcerative colitis  Crohn's disease</p>	<p><b>Neurological movement disorder</b>  dystonia  Tourette syndrome  restless legs syndrome</p>
<p><b>(Chronic) pain disorders</b>  chronic pain (21)  neuropathic pain (8)  fibromyalgia (5)  migraine (3)</p>	<p><b>Bone diseases</b>  arthritis (14)  complex regional pain syndrome (2)</p>
<p><b>Eye and ear disorders</b>  glaucoma  tinnitus</p>	<p><b>Respiratory diseases</b>  chronic obstructive pulmonary disease (COPD) (3)</p>

<b>Spinal disorders</b> scoliosis (2) spina bifida osteoporosis ankylosing spondylitis	<b>Brain disorders</b> brain damage (2) traumatic brain injury (TBI) brain tumour
<b>Iatrogenic disorders (3)</b>	<b>Motor neuron diseases</b> post-polio syndrome (PPS)
<b>Disorders of fascia</b> hernia (8) frozen shoulder (2)	<b>Other</b> premenstrual syndrome (PMS) (2) prostatitis (2) chronic fatigue syndrome (3) chemotherapy-induced nausea and vomiting (CINV) (3) spasmophilia (2) paralysis (3)

(n)= number of interviewees who reported suffering from this condition

Participants' conditions which were treated with cannabis varied in severity, ranging from mild (e.g. headache) to severe (e.g. chronic pain) and life-threatening conditions (e.g. cancer).

The causes of the respondents' medical conditions were diverse, they included road accidents, congenital conditions, postoperative injuries, iatrogenesis, work accidents, traumatic life-events, etc. For instance, one of my respondents **Danny (55)**, who stated that he had already been cured of lung cancer for some time at the point of interview, was still dealing with the adverse effects of the cancer treatments he underwent (including surgery, radiation and chemotherapy). He smoked cannabis daily to relieve pain and cramps. Also **Liesbeth (56)** used cannabis oil orally for (neuropathic) pain caused by cancer and cancer treatments.

Many of the participants' conditions were chronic and diagnosed by physicians and medical experts. Which indicates that they were suffering from serious conditions, genuinely in need of medical treatments. A significant number of interviewees struggled with accepting their diagnosis and had to learn to live with their disabilities and uncertainties about their future. As **Mary (58)**, who suffered from severe physical health problems due to a car accident, noted "*After all, I'm falling apart completely and I'm totally crippled.*" Since most individuals had tried other medical treatments before considering medicinal cannabis use, they had already been suffering from these conditions for a long period at the time of the interviews. Several respondents suffered from conditions which they thought could never be healed (e.g.: spinal cord injury, back injury, COPD, etc.). Participants' conditions are only half the story, since cannabis is mostly used to control symptoms caused by a condition, or for other specific health purposes. The table below lists the most important symptoms and health problems for which cannabis was used by my interviewees (see **table 19**). Interviewees also used cannabis for other health purposes other than those listed in the table, however these were less common among the interview sample. In line with what I found in the survey, (chronic) pain was by far the most common health problem for which cannabis was used (n=47).

**TABLE 19:** INTERVIEWEES' MOST COMMONLY REPORTED SYMPTOMS TREATED WITH CANNABIS

Pain (incl. chronic pain, acute pain, myalgia and neuralgia)	Inflammations	Spasms
Muscle cramps and stiffness	Skin problems	Loss of appetite
Stomach and digestive problems	Sleep problems	Stress
Depressed feelings/feeling sad	Nervousness	

In line with the survey findings, most interviewees were dealing with multiple medical conditions and/or symptoms which they treated with cannabis. While some of them dealt with exclusively physical issues (n=32) or mental issues (n=6), others were living with physical as well as mental health problems (n=24). A remarkable finding was that using cannabis for one symptom or condition, or experiencing therapeutic effects of cannabis on only one ailment, symptom or condition was rare. In other words, cannabis was found helpful for more than one particular health problem.<sup>19</sup>

Health problems for which cannabis was used were more often related because they were caused by the same medical condition (e.g. pain and spasms due to MS). However, this was not always true. For instance, **Patrick (54)** was recently diagnosed with metastatic lung cancer, but also suffered from schizophrenia for almost his entire life. He used cannabis for both conditions. While he experimented with cannabis oil hoping it would affect his brain tumours, he smoked joints to be able to cope with mental difficulties caused by schizophrenia. He needed the cannabis to keep his mind calm and to be able to live with boredom. Although many of participants' conditions were of a different kind, cannabis products were used to treat multiple conditions. When cannabis was not used for all of the participants' health problems, cannabis was often combined with other remedies (e.g. prescription drugs).

### 2.3.1 Mental health problems

One third of the interviewees (n=21) were suffering from (self-) diagnosed mental health disorders, including bipolar disorder, depression, traumatisation, personality disorders, burnout, ADHD, sleep disorders, etc. (see **table 18** above). A larger group than these 21 interviewees used cannabis for psychological purposes, including stress, sadness, suicidal thoughts, etc. Of the 62 interviewees ten participants had a psychological indication as the primary condition for which they used cannabis (e.g. Tourette syndrome, depression, insomnia, etc.).

It was remarkable that many respondents, for whom cannabis was important to cope with psychological issues, said that they "*had been through a lot*". Child neglect, poverty, child sexual abuse, living in mental institutions, loss of a child, suicide attempts, legal proceedings and being a child of alcoholics were traumatic experiences that caused psychological difficulties. Participants explained how cannabis

<sup>19</sup> See PART IV Empirical results: Chapter 2 section 2.1.3 Cannabis, a multi-target drug?

helped them to deal with these psychological difficulties.<sup>20</sup> **Jonas (25)**, suffering from multiple mental health problems, discovered that cannabis could help him coping with these problems:

*“It’s a long story actually. Difficulties started when I was very young. Sleeping problems started when I was eight and I started having difficulties with depression when I was 13 years old. I was 16 when I changed schools, after I stayed in an mental institution for multiple suicide attempts, self-mutilation and depression. Back then I started to use more and more cannabis and I began to notice that I became less depressed and that I had a better sleep. I didn’t hurt myself any longer and I just lived. I did not want to die anymore. That’s why I was like “wow, this really helps me.”” [Jonas/M/25]*

Most interviewees’ psychological disorders were diagnosed by a physician. Similar to the work of Pedersen (2015), I found that two participants reinterpreted their ‘problematic’ behaviour when they were diagnosed with a mental health disorder. The first respondent, **Sandra (42)**, found out she had ADHD when her daughter was diagnosed with the same mental disorder at the age of six. She was convinced that she also had ADHD when she reflected on her turbulent life (e.g. alcohol abuse and deviant behaviour). She felt relieved because “*she was not insane*”. Similar to Sandra, **Armand (50)** found out that he was suffering from Tourette syndrome only from the moment his six year old son received the label. Again, receiving a diagnosis was important and came as a relief for Armand. Both participants self-medicated with cannabis to control their mental health problems. Armand stated expressly that his neurologist supported his use.

[After Armand his son received the diagnosis of Tourette syndrome] *“The penny drops, I was thinking “I must have the same, I am the same.” After the diagnosis a lot has changed. They were able to abandon the diagnosis of ‘drug user’, also in my own mind, especially in my own mind, and move to a medicinal user with a problem. Because, from the moment I knew that I was a medicinal user, I did something else. I sold my motorcycle. I have completely moved away from that wanton, protesting drug user to someone who wants to try to make something of his life. With the same means in a different way. They can judge me, they can give me a fine. I am going to pay it, but they will never again let me believe that I am just a drug user. That is most important to me.” [Armand/M/50]*

Armand’s comments illustrate how his spoiled identity changed when his conditions and behavioural problems were medicalised. When looking retrospectively at his life, his deviant behaviour was translated into a disease (Tourette syndrome), his spoiled and deviant identity (drug user) into a normal identity (patient status) and his illicit drug use into a legitimate treatment (medicinal cannabis use). Also, ADHD, the condition for which Sandra used cannabis, is one of the classic examples of medicalised deviance (Conrad, 2007).

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<sup>20</sup> See PART IV Empirical results: Chapter 2 section 2.2.2.2 The value of the mental effects of cannabis

## 2.4 First introduction to cannabis

Many respondents came across medicinal cannabis use when searching for alternative treatments (mostly online), when they were unable to find satisfying solutions within conventional medicine. Other participants got to know about cannabis from someone within their own social network who used it for medicinal purposes as well, or who had heard about it. Some of the interviewees who were already using cannabis recreationally discovered the therapeutic potential of cannabis themselves (e.g. pain relief, improved sleep, etc.). They noticed improvements during this period and attributed them to their cannabis use. **Armand (50)**, living with comorbid mental health problems, spoke about this period of not being aware of the fact that he was medicating himself. The case of **Kim (31)** is representative for responses exhibited by other interviewees:

*“I have a neuromuscular disease, a progressive disease. Mostly, I have spasms, tense muscles. I always say it is like a violin, my muscles are so tense. I'm losing it at those moments. But, I was smoking [cannabis] already, and I noticed that when I smoked it was really clear that my legs started to relax. Everything became loose again. I also noticed that it helps to sleep.” [Kim/F/31]*

Interestingly, in multiple other cases the cannabis products were originally not intended for the respondent, but he or she was searching for solutions for someone close (e.g. partner) who was suffering from a severe disease. For instance, **Nicole (45)** came across cannabis when she was searching for alternative therapies for her mother who suffered from terminal lung cancer. When learning more about medicinal cannabis use she decided to try it herself for chronic pain and other health problems. **Hendrik (78)**, suffering from COPD, thought that cannabis could have softened the cancer pain of his son-in-law. Unfortunately, his son-in-law died before trying it. Similar to Nicole, during the search for information on cannabis use for pain, he discovered that cannabis could be effective for COPD.

In only a small minority of cases (n=6) it was a physician who recommended or instructed his or her patient to first use cannabis. **David (39)** who had a failed gastric bypass surgery, and consequently lost 84 kilograms because of eating problems, was advised by an occupational physician to smoke cannabis before every meal. The physician first found out that David smoked cannabis sporadically at festivals, when blood tests showed positive results for THC. In two other cases it was a physician who tested a particular cannabis product on the participant in a hospital.

### *3. Discussion*

#### 3.1 Sociodemographic characteristics

The sociodemographic characteristics of the survey participants are similar to findings from other studies conducted abroad in which self-selected medicinal cannabis users are surveyed (Swift et al., 2005; Grella et al., 2014; Reinerman et al., 2011; Ware et al., 2005; Lintzeris et al., 2018; Zaller et al., 2015). The majority are male, in their middle adulthood and have a history of non-medical cannabis use. Most participants in the survey and interviews were unemployed because of disabilities.

In comparison with the survey population more women and unemployed individuals participated in the qualitative interviews. In addition, the average age of the interview sample was slightly higher. All age and gender categories were well represented in the interview sample. These differences in sociodemographic characteristics between the survey and interview participants may explain particular inconsistencies between the survey and interview findings.

The survey results suggest that the sociodemographic characteristics of the three subpopulations differ. Both exclusively medicinal cannabis users and former recreational users were more likely to be unemployed than current recreational cannabis users. This might be an indication of the severity of the medical conditions of the two former subgroups, since they also rated their health as less good and had lower scores on self-reported physical functioning than current recreational cannabis users. A recent study performed in the Netherlands revealed that patients using cannabis on prescription are most likely to be between 41-60 years old and 51.4% of them are female (de Hoop et al., 2018). Exclusively medicinal cannabis users among my survey sample resemble this population better than the two recreational subgroups, because of their older age and the fact that they are more likely to be female. This might indicate that the exclusively medical cannabis users in this study better resemble patients who are authorised to use cannabis medicinally. The Netherlands has already had a medicinal cannabis program for over ten years. Hazekamp and Heerdink (2013) argue that the profiles of people buying cannabis in official Dutch pharmacies on prescription differ from people participating in self-selected surveys, as this study.

#### 3.2 Drug use

Similar to other studies (Bonn-Miller et al., 2014; O'Connell & Bou-Matar, 2007), I found higher prevalence rates of life-time illicit drug use among self-identified medicinal cannabis users compared to the general population. However, most of them did not continue their illicit drug use, which is a negative argument against the gateway theory (Lakenau & Iverson, 2015). The interviews suggest that illicit drugs were used in a recreational context during adolescence and as a form of self-medication for mental health problems.

Participants who have used cannabis for recreational purposes at some point in their lives reported significant higher prevalence rates of other illegal drugs compared to exclusively medicinal users. This finding is consistent with research that suggests that recreational cannabis users report higher prevalence rates of lifetime illegal drugs use than the general population (Decorte et al., 2003). This way, exclusively medicinal cannabis users better resemble the general population regarding illicit drug use.

### 3.2.1 Substitution

In line with previous studies (e.g. Nunberg et al., 2011; Grella et al., 2014; Reiman, 2009), about fifty percent reported substituting prescription medicines with cannabis. My findings suggest that medicinal cannabis users are able to reduce conventional medicines to a certain extent by using cannabis. However, I did not look into the types of medicines that were replaced, so this needs further examination in future research. Piper et al. (2017) found that over three-quarters of members of dispensaries located in New England in the US reduced their opioid use and over one-third indicated that they reduced their use of antidepressants. Other studies suggest that medicinal cannabis users substitute cannabis for analgesics (Boehnke et al., 2019; Boehnke et al., 2016; Lucas & Walsh, 2017) and reduce the use of pain medication after the start of their medical cannabis use (Reiman et al., 2017).

Aggregated studies have shown that opiate-related deaths and prescriptions for pain problems have decreased in states in the US where medical cannabis is regulated (Bachhuber et al. 2014; Bradford & Bradford, 2016). Although we cannot speak of an opioid crisis in Europe like the one in the US, the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) reported in their latest European Drug Report that licit synthetic opioids are increasingly misused in Europe (EMCDDA, 2018). More research is needed on the individual level to look into the possibility of replacing strong opioid analgesics or other harmful medications by cannabinoid drugs as a potential safer and cost-saving alternative.

In line with previous study findings, cannabis was also used as a substitute for substances usually used for recreational purposes (Reiman, 2009; Piper et al., 2017). About half of the survey sample indicated drinking less alcohol since they started using cannabis. This is slightly higher than found in previous research (Piper et al., 2017). Since participants who use cannabis also for recreational purposes were more likely to report a reduction in alcohol consumption than other participants, I expect that alcohol is no longer needed because both alcohol and cannabis can be used for relaxation purposes.

The survey results show that participants report higher rates of tobacco use and lower rates of alcohol consumption in comparison with the general population. This might mean that cannabis and tobacco can be complementary and alcohol and cannabis can be substitutes (Guttmanova et al., 2016). However, the majority of the participants indicated that their tobacco use and alcohol use both went down since they started using cannabis. At the same time, only a minority stated that they replaced alcohol and tobacco with cannabis intentionally, and a large group reported never using cannabis instead of another

substance. It is possible that medicinal cannabis users do not deliberately use cannabis instead of alcohol and tobacco, but that their reduced consumption is an indirect consequence of their cannabis use. There are studies that suggest that cannabis might be useful as a substitute to reduce alcohol consumption (Mikuriya, 2004; Reiman, 2009; Grella et al., 2014; Lucas et al., 2019; Lenza, 2007). However, these studies have been criticised for being limited due to selection bias and their retrospective designs (Subbaraman, 2014; Piper et al., 2017).

Results from other studies regarding the influence of medical cannabis programs on the substitution of cannabis for other recreational substances are mixed. A critical review from 2016 found that on an aggregated level the change of cannabis policies in the US showed evidence both for alcohol substitution as well as complementary relationships (Guttmannova et al., 2016). Another study conducted in the US among adolescents found that the influence of medical cannabis policies on the use of other substances was different between age groups (Cerdà et al. 2018). Further research is needed on the individual level that looks into the impact of using cannabis for medical purposes on the use of other psychoactive substances. Next, more studies are required to look into the potential of substituting more harmful psychoactive drugs with cannabis.

### 3.3 Symptoms and conditions

Most self-identified medicinal cannabis users who participated in this study dealt with complex health problems and comorbid conditions for which cannabis was used. Corresponding to other studies, I found that cannabis was used for a wide range of symptoms and conditions, from minor ailments to life-threatening diseases. This illustrates the versatility of the use of cannabis for health purposes. In line with other research (Swift et al., 2005; Hazekamp et al., 2013; Lintzeris et al., 2018), cannabis was mostly used for chronic pain, followed by sleep problems and depression. Most respondents' medical conditions were formally diagnosed by a physician, a finding echoing previous research findings (Hakkarainen et al., 2015). This indicates that self-proclaimed medicinal cannabis users suffer from serious conditions in need for medical treatments and that they claim medical reasons not simply as a cover-up or justification for using the substance recreationally (Hakkarainen et al., 2015).

Most interviewees' primary purpose for using cannabis were physical health problems, however many survey and interview participants indicated using cannabis for mental health purposes as well. Based on previous research findings I expected that a large part of the reasons for using cannabis would be psychological, because the concept 'medicinal cannabis use' was defined by the participants themselves and because participants were self-selected and not necessarily authorised by physicians (Pedersen, 2015). I found that a significant number of survey participants indicated using cannabis for psychological purposes, mainly sleep problems, depression, stress and nervousness. A large number of the interviewees were suffering from mental health problems for which they self-medicated with cannabis. This includes people suffering from diagnosed mental health disorders as well as individuals



who were not diagnosed with psychological disorders. The interview findings illustrate that also people dealing with physical conditions use cannabis to cope with mental distress caused by these chronic conditions. The literature teaches us that self-medication with psychoactive substances for mental disorders is not without risks. Studies suggest that using cannabis to cope with particular mental health problems heightens the risk of problematic cannabis use, dependence and abuse (Bonn-Miller et al., 2014; Lazareck et al., 2012). More concerted research is needed to assess cannabis dependence and problematic cannabis use in medical cannabis populations who use the substance for mental health problems.

The high number of people using cannabis for psychological purposes is worrisome, because of the current lack of scientific evidence that provides sufficient support for the use of cannabinoid products for mental disorders (Hoch et al., 2019). However, findings from previous studies show that cannabis, and in particular its cannabinoid CBD, has therapeutic potential for particular mental health problems (e.g. anxiety disorders) (Hoch et al., 2019; Crippa et al., 2010; Bergamaschi et al., 2011; Zuardi et al., 2017; Hurd et al., 2015). Further research should examine in which chemical compositions cannabinoid drugs can have medical benefits and are safe to use as treatments for mental health problems.

The survey data show that individuals with a non-medical cannabis history report a higher number of psychologic symptoms and conditions for which they use cannabis than people who use cannabis solely for medicinal purposes. This might indicate that people who have experiences with recreational use more often self-medicate with cannabis to cope with psychological problems. Another indicator for this is the fact that slightly less medical conditions of this group were formally diagnosed by a physician compared to exclusively medicinal cannabis users' conditions. It is possible that they redefined their recreational cannabis use, as many of them discovered the therapeutic utility of cannabis when using it for recreational purposes. They also might have a broader conception of what is meant by 'medicinal cannabis use'.

The high number of self-reported mental health problems among people who use cannabis also for recreational purposes, illustrates the need to gain a better understanding of the relationship between cannabis use and mental health problems. Previous studies demonstrate a positive association between regular cannabis use and the risk for the development of particular psychiatric and substance use disorders (Kedzior & Laeber, 2014; Chadwick et al., 2013; Lowe et al., 2019).

### 3.4 First introduction to cannabis

Most survey participants were using cannabis at the time of the interviews, and less than ten percent of the participants reported no longer using cannabis medicinally. The fact that the vast majority are currently using cannabis medicinally probably biases the results of this study, by reflecting overall

positive experiences and attitudes regarding the medicinal use of cannabis.<sup>21</sup> The main reason for people to quit their use was the inability to find a supply. This is an indication of the difficulties in accessing cannabis in Belgium. However, the number of respondents eligible for answering this question was low (n=26).

Over two thirds of the self-described medicinal cannabis users in the survey had at some point used cannabis recreationally prior to their medicinal cannabis use. Already during this period, many of them discovered cannabis' therapeutic potential, which reflects findings from previous studies (Lankenau et al., 2018). Unsurprisingly, the exclusively medicinal user group reported less often that they noticed beneficial therapeutic effects during recreational cannabis use compared to other participants. Another reason for trying out cannabis is because people had heard about medicinal cannabis use in the media or read about it in a scientific article. As expected, few self-claimed medicinal cannabis users were advised by a physician to use cannabis. This suggests that people start self-medicating with cannabis for diagnosed conditions on their own initiative.

Most participants in the present study were using cannabis for already quite long periods. Similar to recreational cannabis users (Gisle, 2014), most self-described medicinal cannabis users' first contact with cannabis was in their late adolescence. On this matter I found large age-differences between people who had experience with recreational cannabis use and participants who had not. While the first group had already used cannabis for the first time when they were teenagers, for participants who only have experience with using cannabis for medical purposes, their first introduction was around their 40's on average. In the total sample, the mean age when using cannabis for the first time, was lower than the age reported when using cannabis for the first time specifically for health purposes ( $\bar{x}$ =23.33 vs  $\bar{x}$ =31.64). This is another indication that people start using cannabis for health purposes at a later age. An explanation for this might be that young people mainly use cannabis for recreational purposes, while medicinal cannabis use is more prevalent among adults. Another study found that reasons for experimenting with cannabis in adolescence are mainly of a recreational nature (Lankenau et al., 2018). When people get older it is more likely that they will be confronted with diseases and disabilities, which is true in particular for chronic health problems. Another explanation for the finding that cannabis is used for health purposes for the first time at a later age might be that, because medicinal cannabis use is a new phenomenon (Pacula et al., 2016) –or actually making its comeback-, people were only introduced to it later in life.

When comparing the average ages for using cannabis for health purposes for the first time between people having experience with recreational cannabis use and people who have not, I found that exclusively medicinal cannabis users were again significantly older than the other group. The interviews indicate that recreational cannabis users find their way to the use of cannabis for medical purposes more easily by discovering the therapeutic qualities of cannabis themselves, and that exclusively medicinal users are more likely to have exhausted all avenues of conventional medicine before trying cannabis as

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<sup>21</sup> See Part III Methodology: a mixed methods approach. Section 5. Research limitations

a last resort. It might be that people having no experience with recreational cannabis use are more reluctant to start using cannabis because they are deterred by the stigma and its illegal status. Regulating cannabis properly can reduce this stigma, as a consequence people might be more open to try cannabis at an earlier stage of their conditions. I expect that the number of people interested in using cannabis for medicinal purposes will increase overall when regulations change and the stigma associated with cannabis use is tackled.

## Chapter 2

### Self-reported effects

#### *Introduction*

Cannabinoid receptors are widespread in the human body and brain (Lu & Mackie, 2016), through which individuals can experience mental as well as physical effects when consuming cannabinoid products. In this chapter I discuss the effects of cannabis as reported by self-identified medicinal cannabis users. The therapeutic versatility of cannabis is due to the varying effects it produces. Since drug-induced experiences are thought to be subjective (Becker, 1953; Becker, 1973; Zinberg, 1984), respondents' views on desired therapeutic effects and unwanted side effects are discussed.

Previous studies, relying on self-reports, report high rates of satisfaction among medicinal cannabis users regarding the therapeutic efficacy of cannabis (Allegretti et al., 2013; Troutt & DiDonato, 2015; Brunt et al., 2014). The first sections of the interview and survey results explore self-reported efficacy (see 1.1 & 2.1). Multiple studies suggest that cannabis is mainly used for symptom suppression and less frequently as a cure (Swift et al., 2005). This finding will be further explored in the first subsection of the interview results. Previous studies found that medicinal cannabis users consume cannabis most of the time to control multiple symptoms (Swift et al., 2005; Lucas, 2012; Grella et al., 2014). Respondents' experiences regarding this finding are presented in the following subsection. The final subsection on self-reported efficacy explores the wider impact of cannabis' therapeutic effects on participants' quality of life. In addition to efficacy, quality of life measures are important tools to assess the impact of chronic conditions and their treatments.

In the second sections of the survey and interview results I explore self-reported effects (see 1.2 and 2.2), beginning with physical effects caused by cannabis (see 2.2.1). In a subsection the influence of cannabis on mental states is discussed, with a special focus on two well-known stages of intoxication, i.e. being 'high' and 'stoned' (see 1.2 and 2.2.2). The results in this chapter show that cannabis' mental effects were not necessarily always considered as 'medical' nor 'therapeutic'. This leads us to the final subsections that focus on self-defined side effects of cannabis (see 1.3 and 2.2.3).

## 1. Results of the survey

### 1.1 Self-reported efficacy

Using 5-point Likert scales, participants were asked to what extent cannabis is effective in relieving the symptoms for which they used cannabis. Answer options per symptom ranged from ‘no improvement’ to ‘complete improvement’. Overall, cannabis was perceived to be effective in relieving symptoms. For almost half of the symptoms respondents indicated much improvement (47.2%), and for almost a quarter complete improvement (23.0%). For a quarter (25.9%) of the symptoms, participants cited minimal to moderate improvement, and for only 2.2% of the symptoms did participants report no improvement (see **table 20**).

**TABLE 20:** SURVEY PARTICIPANTS’ SELF-REPORTED SYMPTOM IMPROVEMENT (TOTAL NUMBER OF SYMPTOMS=2930)

	N	%
No improvement	63	2.2
Minimal improvement	202	6.9
Moderate improvement	558	19.0
Much improvement	1382	47.2
Complete improvement	675	23.0
I don’t know	50	1.7

The most cited symptoms ( $n > 50$ ) were compared with regards to self-reported efficacy, to identify significant differences. These results show that perceived improvement was more or less consistent across these symptoms. Some notable results were that more than one in ten reported no or minimal improvement for inflammations (14.1%), stiffness (10.4%), panic (12%) and low energy (17.4%). More than one in ten thought cannabis did not alleviate loneliness (12.7%). More than four in five believed cannabis improved the following symptoms greatly or completely: sleep problems (81.9%), nervousness (81%), anger (81.3%), and spasms (80%). Nine out of ten reported much or complete improvement for hyperactivity (90.6%) (see appendix 1, **table 20a**).

I asked survey participants if their quality of life had changed since they started using cannabis. Using a Likert scale, participants could indicate if they believed the quality of their life had worsened, had not changed or improved. While the majority of respondents believed that their quality of life had improved since the start of their cannabis use ( $n=351$ ; 94.3%), only five percent of the sample reported that it had been fully restored ( $n=19$ ). About five percent indicated that their quality of life had not changed ( $n=16$ ), and about one percent claimed that it had worsened ( $n=5$ ) (see **table 21**).

**TABLE 21:** INFLUENCE OF CANNABIS ON SURVEY PARTICIPANTS' QUALITY OF LIFE (N=372)\*

	N	%
My quality of life has been fully restored	19	5.1
My quality of life has improved a lot	208	55.9
My quality of life has improved somewhat	124	33.3
My quality of life has not changed	16	4.3
My quality of life has worsened somewhat	2	0.5
My quality of life has worsened a lot	1	0.3
My quality of life is worse than ever	2	0.5

\*N=372, because nine participants selected the option 'I don't know'.

The three subpopulations -exclusively medicinal, previous recreational and current recreational users- were compared regarding self-reported quality of life, but no significant differences were found ( $p>0.05$ ).

## 1.2 Psychoactive effects

I assessed participants' attitudes regarding the psychoactive effects caused by cannabis using a Likert scale. Participants had to indicate whether or not they agreed with the following statements: '*Cannabis' psychoactive effects have changed over time*'; '*The 'high' is of therapeutic value*'; and '*I use cannabis to become 'high'*'. Answer categories included 'strongly disagree', 'disagree', 'neither agree nor disagree', 'agree' and 'strongly agree'. I reduced the categories 'strongly disagree' and 'disagree' into 'disagree', and 'agree' and 'strongly agree' into 'agree'. While forty percent of the total sample agreed with the statement that the psychoactive effects of cannabis have changed over time ( $n=151$ ), about thirty percent disagreed ( $n=108$ ). Two-thirds ( $n=243$ ) believed that the 'high' is therapeutically valuable. Half of the sample ( $n=194$ ) disagreed with the statement that they use cannabis to become 'high' (see **table 22**).

**TABLE 22:** SURVEY PARTICIPANTS' ATTITUDES TOWARDS PSYCHOACTIVE EFFECTS CAUSED BY CANNABIS (N=371)\*

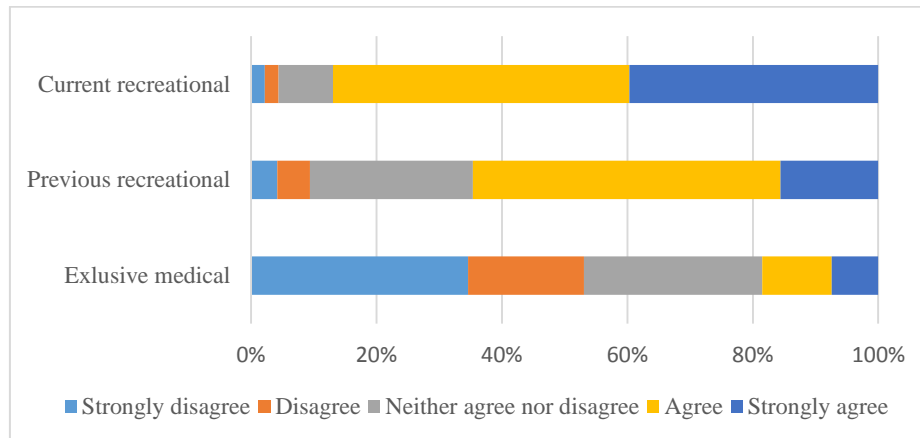
	Disagree		Nor disagree, nor agree		Agree	
	N	%	N	%	N	%
Cannabis' psychoactive effects have changed over time	108	29.1	112	30.2	151	40.7
The 'high' is of therapeutic value	61	16.5	67	18.1	243	65.5
I use cannabis to become 'high'	194	52.3	101	27.2	76	20.5

\*N=371, because ten participants did not answer these questions because they did not complete the survey entirely.

Current recreational users agreed more with the statement that the 'psychoactive effects of cannabis have changed over time' than exclusively medicinal cannabis users ( $p<0.001$ ). This group is also more likely to agree with the statements that the 'high' is therapeutically valuable' ( $p<0.001$ ) and that they

‘use cannabis to become ‘high’’ ( $p < 0.001$ ). Only 18.5% of the exclusively medicinal cannabis users agree with the statement that the ‘‘high’ is of therapeutic value’, whereas for current recreational users this proportion is 87% (see **figure 6** and appendix 1, **table 22a**).

**FIGURE 6:** THE ‘HIGH’ IS OF THERAPEUTIC VALUE (COMPARISON BETWEEN THE THREE SUBGROUPS)



The other section on psychoactive effects in the survey covered experiences and attitudes only towards the ‘high’ of cannabis. Participants were first asked if they have ever felt ‘high’ due to cannabis. Participants who answered this question positively, had to indicate how frequently they felt ‘high’ during the past twelve months, and whether or not they enjoyed feeling ‘high’ when using cannabis for health purposes. For both questions I used a Likert scale ranging from ‘never’ to ‘always’. Participants were also given the possibility to answer that they never experienced a ‘high’ when using cannabis for health purposes (see **table 23 and 24**).

**TABLE 23:** SURVEY PARTICIPANTS’ EXPERIENCES WITH THE ‘HIGH’

Ever felt ‘high’ (N= 364)*	N	%
Never felt ‘high’	45	12.4
Felt ‘high’ in the past, but not anymore	59	16.2
Feels ‘high’ (at times)	260	71.4
Felt ‘high’ the past 12 months (N=318)**		
Never	20	6.3
Rarely	92	28.9
Occasionally	35	11.0
Frequently	83	26.1
Always	88	27.7

\*N=364, because four participants did not answer this question because they did not complete the survey entirely. Three participants selected the option ‘I prefer not to answer’ and ten participants selected the option ‘I don’t know’.

\*\* N=318, because this question was only shown to participants who indicated that they have felt ‘high’ (n=319) and because one participant selected the option ‘I don’t know’.

A large proportion of the sample indicated they have felt ‘high’ (at times) when using cannabis (n=260; 71.4%). 16.2% (n=59) said that they felt ‘high’ in the past, but no longer at this moment, and the

remaining 12.4% (n=45) reported that they have never been ‘high’ due to use of cannabis. People who have ever felt ‘high’ in their lives because of cannabis were asked how many times they felt ‘high’ during the past twelve months. Half of this subsample reported feeling ‘high’ most or all of the time (n=171). Forty percent reported being ‘high’ rarely or occasionally (n=127) and the remaining six percent said that they had never felt ‘high’ during the past twelve months (n=20) (see **table 23**).

The majority of the participants who have ever felt ‘high’ think that it is frequently or always a pleasant effect when using cannabis for health purposes (n=198; 61.1%). Five percent reported that the ‘high’ was never a pleasant effect (n=16). A small subpopulation (n=35; 10.8%) reported that they did not experience a ‘high’ when using cannabis for health purposes (see **table 24**).

**TABLE 24:** ENJOYS FEELING ‘HIGH’ WHEN USING CANNABIS FOR HEALTH PURPOSES (N=324)\*

	N	%
Never	16	4.9
Rarely- occasionally	75	23.1
Frequently- always	198	61.1
Does not experience a ‘high’ when using cannabis for medicinal purposes	35	10.8

\*N=324, because seven participants did not answer this question because they did not complete the survey entirely, and because this question was not shown to participants who indicated that they never have felt ‘high’ (n=45). One participant selected the option ‘I prefer not to answer’ and four participants selected the option ‘I don’t know’.

While half of the exclusively medicinal users group indicated that they have never felt ‘high’ in their lives due to cannabis (50.7%), this was less than four percent in the two other subgroups ( $p < 0.001$ ) (see appendix 1, **table 23a**). Unsurprisingly, for the past twelve months current recreational users report feeling ‘high’ most often ( $p < 0.001$ ), and previous recreational users felt ‘high’ more often than exclusively medicinal users ( $p = 0.046$ ). Of the respondents who have experienced a ‘high’, current recreational cannabis users were more likely to think of it as a pleasant effect when using for health purposes than the two other subgroups ( $p < 0.001$ ) (see appendix 1, **table 23b**).

### 1.3 Side effects

The survey participants were asked to rate the impact of well-known ‘side effects’ of cannabis on their quality of life on a Likert scale ranging from ‘negative’ to ‘positive’. If people had never experienced a particular effect they were asked to select ‘not applicable’.<sup>22</sup> The listed effects are based on side effects found in previous research and in the pilot interviews. I decided to assess the positive as well as negative impact of these effects because of their subjective nature (see **table 25** and **26**).

<sup>22</sup> It is possible that this question in the survey was misunderstood. Participants who chose the answer ‘positive’ might have thought that this answer meant having experienced the effect. Conversely, participants who chose the answer ‘negative’ may have thought that this answer meant not having experienced the effect. Whereas, the Likert scales ranging from negative to positive actually asked about the impact of these effects on participants’ quality of life. When respondents never experienced a certain effect, they should have selected the answer ‘not applicable’. Therefore, these results need careful interpretation.



**TABLE 25:** EXPERIENCES WITH FAMILIAR ADVERSE EFFECTS CAUSED BY CANNABIS (N=381)

	Yes		No	
	N	%	N	%
Drowsiness	313	82.2	68	17.8
Feeling 'high'	305	80.1	76	19.9
Increased appetite	283	74.3	98	25.7
Dry mouth	267	70.1	114	29.9
Being confused/ forgetful	217	57.0	164	43.0
Increased heartrate	168	44.1	213	55.9
Weakness	138	36.2	243	63.8
Decreased appetite	137	36.0	244	64.0
Blurred vision	124	32.5	257	67.5
Dizziness	124	32.5	257	67.5
Fear, paranoia, hallucinations	113	29.7	268	70.3

The majority of the 'side effects' that I presented to my respondents were not experienced by the majority, these included: reduced appetite; weakness; blurred vision; dizziness; increased heartrate; and fear, paranoia and hallucinations (see **table 25**).

**TABLE 26:** ATTITUDES TOWARDS FAMILIAR ADVERSE EFFECTS CAUSED BY CANNABIS

	Positive		Neutral		Negative	
	N	%	N	%	N	%
Drowsiness (N=313)	235	75.1	50	16.0	28	8.9
Feeling 'high' (N=305)	222	72.8	56	18.4	27	8.9
Increased appetite (N=283)	169	59.7	70	24.7	44	15.6
Dry mouth (N=267)	56	21.0	83	31.1	128	47.9
Being confused/ forgetful (N=217)	31	14.3	70	32.3	116	53.5
Increased heartrate (N=168)	23	13.7	90	53.6	55	32.7
Weakness (N=138)	30	21.7	56	40.6	52	37.7
Decreased appetite (N=137)	39	28.5	54	39.4	44	32.1
Blurred vision (N=124)	17	13.7	54	43.5	53	42.7
Dizziness (N=124)	16	12.9	54	43.5	54	43.5
Fear, paranoia, hallucinations (N=113)	21	18.6	46	40.7	46	40.7

The majority of respondents who indicated having experienced drowsiness thought that this effect was positive for their quality of life (n=235; 75.1%). The majority thought the 'high' (n=222; 72.8%) and increased appetite (n=169; 59.7%) was positive. About half thought being confused or forgetful (n=116) was negative, as well as having a dry mouth (n=128) (see **table 26**).

## ***2. Results from the face-to-face interviews***

### **2.1 Self-reported efficacy**

For most of my interviewees, cannabis was an efficacious treatment for their conditions. Only two out of the 62 interviewees reported mostly unsuccessful outcomes from using cannabis, which will be discussed below. The fact that cannabis was therapeutically effective was mostly based on respondents' own experiences and judgements, and not on physicians' assessments. For instance, certain participants (n=7) reported visual improvements of their skin disorders and problems. **Luc (64)** who suffered from ulcerative colitis, said that he experienced his stools were much firmer and the colonoscopies were positive since he started using cannabis. Some respondents reinforced their argument that their claims about cannabis efficacy were not only based on self-perception, by arguing that other people noticed improvements.

With regards to the therapeutic potential of cannabis, participants used the following, sometimes tentative, expressions more often: *'I noticed that...'*, *'I felt that...'*, *'I have found out that'...*, *'I suspect that...'*, *'I have the impression that...'*, *'I experienced that...'*, etc. Some interviewees (n=5) noted meaningful improvements for which they thought physicians were unable to give explanations. **Chris (37)**, suffering multi-morbidity, observes:

*"I used to have shortness of breath and a lot of bronchitis, but lately it has improved, since I started with cannabis. The physician said that she no longer heard my lungs wheezing. She even had to listen twice, she heard nothing, completely nothing. She didn't understand it, it did not add up for her at all!" [Chris/M/37]*

During the interviews, participants recounted their life story and how they ended up using cannabis for health reasons. Most of the time, they talked extensively about the period before they used cannabis when their health status was poor and standard treatments were ineffective. Interviewees explained how those treatments caused unbearable adverse effects, which impacted their quality of life and functioning. Multiple respondents described how their health status worsened during periods when they were not using cannabis to illustrate the efficacy of cannabis.

As mentioned before in this thesis, cannabis was primarily used as a treatment for pain. Only a few interviewees declared that they were freed from all pain (n=4). The great majority acknowledged that their pain was never completely gone, but cannabis 'took the edge off' and therefore it became bearable. Previously, the pain dominated interviewees' daily lives. **Roland (47)**, for whom pharmaceutical analgesics were ineffective for severe facial pain (trigeminal neuralgia), explains that the use of cannabis improves his quality of life without eliminating the pain he is suffering from. **Rudy's** comments are illustrative of the responses I received when I asked interviewees if cannabis eliminated pain:

*"When you are in pain you will get in some kind of a cocoon. I pull my blankets over me, television off,... I can't stand anything. With cannabis this cocoon is lighter, softer, it makes it more bearable. The pain doesn't disappear, unfortunately. If you hit yourself*

*against the door and you have pain, then tramadol will help. But against neuralgia, no. Then I use marijuana. I must admit, it doesn't help a lot against the pain. I compare it with a silk glove. It is not a leather glove, but a silk glove, a woollen glove in the winter. It's still cold with a woollen glove. But it is better than nothing, isn't it?" [Rudy/M/55]*

Since cannabis was ineffective in eliminating pain according to most participants, I asked them if consuming a higher dose or a stronger cannabis product would be more successful. Interviewees confirmed that this could result in a higher efficacy regarding pain relief, however this was balanced against possible side effects of cannabis and still being able to function (e.g. *"feeling nothing anymore"*). Similarly, participants reported that more effective medicines were available. However, cannabis was preferred because of the side effects of the aforementioned medications. The narrative of **Bert (39)**, who was almost bedridden due to severe back problems, illustrates the importance of the therapeutic window:

*I: "Your pain was more reduced by using a higher dose of cannabis?"*

*R: "Yes, of course, but you have to keep boundaries. If I would double my medicines, the pain will also be less, but what will be left of me? In the period when they gave me tramadol, in the end this was 600 milligrams per day, I still had pain every day. I was living like a zombie. I didn't realise what was happening around me. From then on I said, "I never want to go through this again.""* [Bert/M/39]

**Maarten (37)**, who was paralysed from the neck down and wheelchair bound, notes the importance of balancing symptom-relieving effects and consciousness-altering effects, in order to remain functional.

*I: "Suppose you would smoke a higher dose, would this take away the pain?"*

*R: "The pain might go away, but I will also be as high as a kite. I will no longer know if it is pain or not. I try to find a balance between not being stoned and that it remains effective. I still want to function in a way."* [Maarten/M/37]

Multiple respondents gave detailed and colourful descriptions of their experiences when cannabis started to affect their symptoms, which sometimes differed from taking conventional medicines. **David (39)**, who had trouble eating because of severe stomach problems, described how his food seemed *"to crumble"* when smoking cannabis after his meal. When having used cannabis he experienced less discomfort than he usually did after eating, including nausea, vomiting, cramps and diarrhoea. **Chris (37)**, suffering from chronic back pain, stated that it feels as if the cannabis oil seeps from his head through his back causing pain relief. **Claire (51)** in turn, stated *"in the beginning it felt like that they placed a vacuum cleaner at my big toe and sucked all pain out of my body"*. **Liesbeth (56)**, suffering from neuropathic pain, narrated her experience vividly: *"I take it and then I feel it very clearly in my jaw. It is like it starts to bubble. Then I know that it starts working. Strange..."*. **Katrien (45)** underwent back surgery, which caused temporary leg paralysis and chronic neuropathic pain:

*"The nerve was damaged and a part of it doesn't work anymore. It went in overdrive. The only signal it can still give is pain. It seems that cannabis just intervenes. In the beginning, I really felt it when I took cannabis. I was lying in bed in pain, and from the*

*moment the cannabis was in my blood, the pain suddenly disappeared. The strange thing is, cannabis will affect these pains where everything else cannot reach.*” [Katrien/F/45]

### 2.1.1 Cannabis, a panacea?

From the interviews it appeared that cannabis is perceived as effective in relieving many different types of health problems (e.g. pain, nausea, skin problems, bowel problems, etc.). The previous sections show that cannabis is believed to have various therapeutic effects. Consequently, a question that arises is ‘if self-identified medicinal cannabis users think of cannabis as a panacea.’ During the interviews twelve participants stated spontaneously that “*cannabis is (unfortunately) not a wonder drug*”. Most interviewees thought that cannabis did make a (substantial) difference for their quality of life. At the same time their expectations remained realistic, as they believed that, just like all other medicines, cannabis was not a cure-all for all diseases on earth. According to the interviewees, not every medicine is equally effective for every person, and this is no different for cannabis.

The belief that cannabis was not flawless was partly based on respondents’ own experiences. Some tried cannabis as a treatment for certain symptoms and conditions for which it turned out to be unsuccessful, or only marginally successful (e.g. diarrhoea, nausea, acid reflux, arthrosis, etc.). **Helena (60)**, a cancer patient, stated that taking cannabis induced nausea instead of reducing it. **Isabelle (46)** in turn, had expected more from cannabis regarding pain relief and the improvement of energy, but she continued using cannabis because it was mostly effective. In addition, multiple respondents declared that cannabis was ineffective in relieving particular ailments, for example acute headache or toothache. For some of these symptoms and conditions they had to rely on other treatments (e.g. conventional medicines or herbal treatments).<sup>23</sup> Three respondents spoke of cannabis as a tool. It was “*a crutch*” that helped **Louise (29)** “*to eat and feel better mentally*”, and it helped **Thomas (35)** and **Willy (70)** “*to handle pain*”.

Two interviewees from my sample no longer used cannabis for medicinal purposes at the time of the interviews due to dissatisfaction. One of them is **Lode (39)**, who was living with MS and for whom cannabis was ineffective, when he tried it for his bladder problems. He did not notice a significant therapeutic difference and decided it was not worth it to keep on using cannabis for health purposes on a frequent basis. As a consequence, he noted only using cannabis for recreational purposes from time to time. The other interviewee, **Maggy (44)**, suffering from dystonia, had a constant severe cough when vaporizing cannabis. In addition, she had to increase the cannabis dose because it was no longer effective in relieving pain after using it for a couple of months. She decided to quit vaporizing and to test cannabis oil. However, when ingesting cannabis oil orally she experienced palpitations and an extremely dry mouth. Furthermore, Maggy stated that one time she had a panic attack due to an overdose of cannabis oil. These negative experiences were the reason for her to stop using cannabis. Maggy believed that the lack of available information on dosing and side effects, and the lack of medical supervision, played a

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<sup>23</sup> See PART IV Empirical results: Chapter 5 section 2.1.1 Standard treatments

part in this unsuccessful experience with medicinal cannabis use.

Another indication that undermines the idea of cannabis as a panacea, is the fact that cannabis was most often used for symptom management and less frequently as a cure.<sup>24</sup> **Tom (37)**, who combined cannabis with eye drops to treat glaucoma, acknowledged the importance and value of conventional treatments.

*“It is not a panacea, you can’t say “let’s close all the pharmacies and we will open a coffee shop instead.” No, it doesn’t work that way. Cannabis can be a support, it relieves pain and is anti-inflammatory, but it is not going to cure me.” [Tom/M/37]*

**David (39)**, who suffered serious complications arising from failed stomach surgery, was still living a difficult life despite his medicinal cannabis use. Due to his physical disabilities he was still unable to work and to participate in social life:

*“In the long run cannabis doesn’t heal. I don’t believe if I smoke for another ten years, suddenly I’m going to have another life. It works, it makes my life more comfortable, but nothing more. It diminishes a part of my symptoms at the time I have smoked, but it doesn’t have long-lasting effects. It isn’t a panacea, unfortunately. It has also disadvantages. I can’t start smoking in the morning, so in the morning I’m suffering a lot. I have to wake up earlier to get things done. When I have an appointment at eleven, I have to set my alarm at eight. So I can eat at ease and lie down until the pain from eating is over. This lasts twenty to thirty minutes. I’m starting to accept that I will suffer for the rest of my life. Compared to before, I can do a lot now, but it’s still not enough to have a fun life. So yeah, I have mixed feelings.” [David/M/39]*

Similar to David’s case, most of the time cannabis did not turn medicinal users into the persons they were before they became ill or disabled. Multiple interviewees were still physically or mentally limited in some way in their daily lives (e.g. not able to walk long distances). **Anthony (50)**, a MS patient, lost most of his physical power because of the disease, and he recounted that this was not restored by his cannabis use.

Furthermore, most respondents had additional prescription and non-prescription therapies alongside cannabis to be able to cope with their health problems, including exercising, pharmaceutical medication, surgery, hypnotherapy, dietary supplements, meditation, herbal medicine, hormone therapy, etc. During the interviews some participants spoke of other treatments (e.g. surgery) they were willing to try in the near future that could have a positive impact on their conditions, because cannabis was only partially effective. At least 25 interviewees underwent psychological treatment or were still seeing a psychotherapist at the time of the interviews. These included mainly individuals dealing with diagnosed psychological disorders, but also people who were struggling with the impact of their chronic physical conditions on their quality of life. Interviewees relied on remedies other than cannabis for physical health problems as well. Many of the respondents were currently seeing a physiotherapist, or have received physiotherapy in the past. Two men, dealing with chronic pain caused by a car accident, took a hot bath

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<sup>24</sup> See PART IV Empirical results: Chapter 2 section 2.1.2 Healing versus symptom management

every morning to overcome morning stiffness and pain. Another male respondent still took two or three showers a day, since it was efficacious for his neuropathic pain and using cannabis alone was insufficient. These examples illustrate that cannabis was not perceived as a magical solution to participants' health problems.

Only two respondents in the sample spoke spontaneously of cannabis as a panacea, because they achieved very positive results from using it. One of them, **Sabine (51)**, who was suffering from physical and mental health problems, said that cannabis was a “*wonder drug and a sacred herb*” because it had a major impact on multiple areas of her life.

### 2.1.2 Healing versus symptom management

Similar to previous research findings (Swift et al., 2005; Dahl & Frank, 2011), most interviewees used cannabis for symptom relief and not to cure their diseases. According to my respondents, cannabis was not able to tackle the causes of their symptoms, and consequently symptoms were only suppressed by cannabis. When respondents were asked if they thought that cannabis had healing effects, answers diverged. Many respondents thought that it was possible cannabis had healing properties, but not necessarily for their own conditions.

*“Marijuana doesn't treat anything. It will suppress pain, like a painkiller that suppresses pain. It will relax my muscles like a chemical muscle relaxant does. But it will not make sure that I won't have any muscle spasms anymore.” [Anny/F/58]*

When asking participants about the healing properties of cannabis, multiple individuals mentioned that cannabis was not a panacea. At the same time, there were no real solutions in Western medicine for their health problems. In this respect, three respondents stated that conventional medicine had nothing more to offer than symptom management. According to these participants, curative standard treatments were lacking and more often physicians were not searching for the causes of certain symptoms.

A few other interviewees were hoping that cannabis was curative and believed in the possibility. They were not sure if they were using the substance correctly for cannabis to be curative. **Monique (64)**, a terminal lung cancer patient and who tried cannabis as a curative treatment, thought that the amounts of cannabis she used might not have been high enough in order for it to be efficacious as a cure for cancer. Monique started only recently ingesting cannabis oil on her own initiative, after her oncologist told her that there were no therapeutic options left of her. She was desperately looking for medical guidance and information about the use of cannabis by cancer patients. During the interview she asked the researcher many times for medical advice.

Some of the interviewees were using cannabis not as a cure in the first place, but had a glimmer of hope that cannabis had curing properties. **Jolien (25)**, suffering from MS, thought that her smoking behaviour for symptom management would not cure her disease. However, she hoped that using strong

concentrated THC oil would do. Jolien noted that since she was using CBD oil she experienced less deterioration in physical function. **Anthony (50)**, another MS patient who smoked cannabis for symptom management, stated that his physical health had not worsened since he started using cannabis. During the interview, he wondered out loud if cannabis could have played a part in this.

Finally, a number of interviewees were convinced of cannabis' healing properties (n=8). These judgements were partially based on their own experiences. Interviewees claimed that they noticed themselves or medical tests showed that inflammations and bulging had reduced, pressure ulcers healed, movements improved, levels of inflammatory markers dropped, skin problems improved, etc. **Armand (50)** suffered from Tourette Syndrome and ADHD for which he self-medicated with cannabis. At the same time, he believed that his daily cannabis use might have impeded the development of skin cancer:

*"I've been walking around with a skin cancer mole for nine years. The physicians didn't understand how an aggressive cancer hadn't spread. Meanwhile, the mole has been cut out and later I never noticed anything from it anymore. They started looking for metastasis and checked my kidneys, but nothing. The doctor said "you had quite some luck sir". Then I kept my mouth shut wisely. I was like "I think it's good that I used cannabis all this time". It's true that I was lucky, but I have the feeling cannabis had something to do with it."* [Armand/M/50]

In a few cases (n=5), the primary motive to use cannabis was with the intention to cure a disease. Five respondents, living with advanced stage cancer, ingested cannabis oil orally with the hope it would shrink tumours and kill cancer cells. Two out of the five cancer patients used cannabis also intentionally to cope with CINV and cancer symptoms. All of them used cannabis alongside standard cancer treatments. Two of them reported positive results of using cannabis simultaneously with cancer treatments, and believed in the curative properties of cannabis. The other three respondents were still awaiting the results at the time of the interview. Sadly, two of them died during the period of the study.

Two female respondents whose cancers were stabilised at the time of the interviews, were firmly convinced that if their cancers would spread again and chemotherapy would be necessary, they would refuse the treatment and only use highly concentrated cannabis oil as a cure again. They thought of chemotherapy as an inhuman and degrading treatment.

*"I have had chemotherapy and I think it's an inhuman treatment. It brings you down terribly. It affects your self-esteem. Beginning in 2014, my oncologist said "It keeps growing and if we are a year later, we can't do anything about it anymore. So then we really have to look for a new treatment". I have also used a lot of alternative remedies, but it could never be stopped, never... It kept on growing all the time. I was like "I give up" and I did say "I'll surrender and we will see what happens." Then a friend of ours suggested "Why don't you try cannabis oil?"* [Helena/F/60]

Alongside using cannabis for symptom relief and as a curative treatment, cannabis was used to prevent certain symptoms from manifesting (e.g. pain attacks). This way, cannabis functioned mainly as a 'maintenance drug'. Two respondents used cannabis primarily as a prophylactic treatment or what they

called, “*a preventive medicine*”. According to them, using cannabis was a general investment in health and prevented certain health problems. **Luc (64)**, living with inflammatory bowel disease, noted that during the two years he was using cannabis oil his health did not decline, instead it improved. The other respondent is **Marie (43)**, who had a strong family history of breast cancer. This made her concerned about getting breast cancer as well. She thought it could not hurt to try taking CBD oil in order to prevent cancer, and used it daily. A significant number of interviewees were convinced that using cannabis was good for their health in general, and that it was the reason that their health had remained stable.

### 2.1.3 Cannabis, a multi-target drug?

Many interviewees claimed that they noticed cannabis improved certain ailments, although they were using the substance for other health purposes. For instance, **Luc (64)** mentioned that he noticed that the rash on his chest had disappeared, while he was using cannabis for bowel problems in the first place. A lot of interviewees stated that cannabis induced sleep and mental relaxation. This was most of the time seen as a positive thing, including amongst interviewees who were using cannabis solely for physical health problems. The fact that cannabis improved health problems other than those for which respondents were using the drug, was brought up spontaneously by multiple participants. This is illustrated in the following cases.

**Carl (29)**, who smoked cannabis to cope with his bipolar disorder, recounted the following:

*“I don’t think it’s a coincidence, but from the age of 18 until 20 I have had very severe migraines. From the age of 20 I started smoking pretty strong weed and I have had no migraines since then. I assume it’s because of cannabis, how is this possible otherwise? The migraines never returned and I’m now 29.”* [Carl/M/29]

While **Bea (55)** used cannabis oil for morphea, a rare autoimmune skin disorder, she noticed other physical and mental therapeutic effects:

*“I still take a bit of cannabis oil every night to be sure to sleep well. I think that’s fantastic. But what I started to notice at a given moment was that the aching and tingling sensations in my legs were gone as well as the urge to move my legs when lying in bed [restless legs syndrome]. Next, as you can see I have very dry skin. For years I have not been able to walk around without plasters. My skin was constantly hardening and cracking. My hands and elbows were completely dried out. Now it’s like it has become baby skin. I discovered this by chance. You start to notice that other pains are also gone. All the ailments from aging are gone by taking cannabis oil, funnily enough. I noticed that many things suddenly disappeared, but I’ve never done it on purpose. So this is all great.”* [Bea/F/55]



The next respondent, **Lode (39)**, who suffered from MS, reported an unsuccessful attempt in treating his bladder problems with cannabis. However, he noticed that cannabis had a small beneficial effect on his asthma.

*“I think it doesn’t really help against bladder problems. I notice a very small difference, but not enough to be helped in the long run. What I did notice was that it does have a direct effect on my asthma. Sometimes, in the evening I was thinking should I use a puffer or should I try using cannabis? So, I tried to use a bit of cannabis and it relaxes your airways to a certain extent. It takes away the tightness. This was actually the biggest effect that I got from cannabis, a larger effect than on my bladder. I didn’t expect this effect at all. This was also not the reason why I was using it.” [Lode/M/39]*

Finally, **Liesbeth (56)** orally ingested cannabis oil for severe neuropathic pain in her jaw, which was caused by cancer and cancer treatments. However, she and her family noticed a positive influence of cannabis on her mood as well.

*“My daughter asks me “did you take your drops already, because you’re all of a sudden happy again?” It is true that I tend to be somewhat depressive at times. I don’t always feel good about myself. I can honestly tell you that the relationship with my husband is over, there is nothing left. At times this is difficult, so I don’t take cannabis oil for this, but it does help. It really has an influence on your mood.” [Liesbeth/F/56]*

These unanticipated effects of cannabis can be seen as ‘welcome side effects’ or ‘therapeutic side effects’. Many of the interviewees used cannabis for more than one condition and/or symptom concurrently. For instance, **Sandra (42)** smoked cannabis as a treatment for ADHD and for PMS at the same time. Cannabis was found beneficial for (less severe) ailments, including stress, wounds, ulcers, skin patches, warts, chapped lips, symptoms due to menopause, pain due to a broken tooth, etc. Participants stated when they stopped using cannabis for a while, particular ailments returned which were otherwise suppressed by cannabis.

#### 2.1.4 Impact of medicinal cannabis use on interviewees’ quality of life

Most interviewees were convinced that cannabis had a positive impact on their quality of life. A number of respondents referred to the fact that their life was liveable again and more bearable. Interviewees stated that cannabis performs a therapeutic function that enabled them to function in their daily lives, including running a household and working. They were able to perform certain activities, which they were not able to do before they started using cannabis (e.g. housework, going out late, working out, painting, playing with their children, walking longer distances, etc.). For a few participants, their use had significant positive consequences in social terms. Because cannabis improved their health and well-being, it also improved their relationships with their family members and other important people. For instance, **Sophie (37)**, living with fibromyalgia, said she was able to play with her two young children again, because she was in less pain.

Some participants were convinced that cannabis had a major impact on their lives. **Bruno (55)**, suffering from prostate cancer, changed his negative view on cannabis radically after achieving positive results from using cannabis during severe episodes of CINV:

*“I take those drops [cannabis oil] and minutes later I start eating warm meals. It is unbelievable. Chemotherapy or not, you’ll eat. But without drops, you can’t eat, almost nothing. I couldn’t walk straight with my right hip. But when I was taking those drops for 2-3 weeks, I was able to do everything again. Incredible... I couldn’t believe it, because I’ve been really opposed to it, against drugs and marijuana.”* [Bruno/M/55]

**Willy (70)**, whose wife was partially paralysed and who dealt with severe aphasia, spoke about the valuable impact of cannabis on his wife’s life. Most of the day she was lying in bed and could barely communicate. She drank low potency cannabis-infused milk four times a day to relieve pain. Her husband said that it could be that she “*was addicted to this milk*”, however he noted:

*I: “For your wife, is there a difference compared to before?”*

*R: “A world of difference. In terms of pain. And life... If you can even talk about life, what is left of her life. But in any case, what she still has, is bearable. Give her her life, the life which remains. All that she has left, I try to make it as good as possible and cannabis is a solution”* [Willy/M/70]

Three respondents stated that without cannabis they probably would have needed psychological treatment, or that they would have ended up in psychiatry. Some respondents even spoke about cannabis in terms of life or death. **Nicole (45)**, suffering multi-morbidity, had a first conversation with a physician about euthanasia last year. She believed that when cannabis would be taken away from her “*it would mean the end*”. Five other participants stated that they “*would not be around anymore without cannabis*”. **Roger (53)**, suffering from cluster headaches, argued that his suicidal ideation was gone because of cannabis, and by no longer using pharmaceutical medicines:

*“I was like, come on guys, make an end to it, it has been enough. Those thoughts are gone now. I can say that my quality of life has increased significantly. This is for a large part due to cannabis. If I would have followed the advice of those physicians I would have been addicted to medicines by now. I was already taking strong morphine.”* [Roger/M/53]

For other participants the impact of cannabis did not reach this far. Their physical and mental health problems still limited them in their daily lives. These respondents thought that cannabis had a small impact on their lives. For instance **Luc (64)**, using cannabis mainly as a prophylactic treatment, stated that he could live without cannabis, but thought this would be a loss. He compared it with the fact that humanity can live without music, poetry, literature, etc., but this is undesirable. A few respondents who used cannabis almost their entire life, could not tell how their lives would be without cannabis.

## 2.2 Self-reported effects

The extensive table below presents all interviewees' self-reported therapeutic effects (see **table 27**). Similar to participants' symptoms and conditions, this table shows a wide variety of different types of therapeutic effects, including physical as well as mental effects. When I asked respondents what they experienced when using cannabis they mentioned first and foremost physical effects, mostly subjective improvements. Overall, psychological effects were less often cited and less valued, except by participants for whom cannabis was most important for mental health purposes.

**TABLE 27: INTERVIEWEES' SELF-REPORTED THERAPEUTIC EFFECTS OF CANNABIS (N=62)**

Heals mouth ulcers	Heals chapped lips	Improves dry skin
Relaxes air ways	Opens air ways	Relieves coughing
Relieves pain	Relieves neuralgia	Relieves inflammations
Relaxes lower oesophagus sphincter	Increases appetite	Decreases nausea
Improves restless legs syndrome	Induces sleep	Prevents migraine
Relieves irritable bowel syndrome	Relieves diarrhoea	Prevents convulsions
Relieves stomach cramps	Physically relaxing	Improves taste
Relieves chemotherapy induced symptoms	Diverts attention away from tinnitus	Improves erectile dysfunction
Relieves cramps	Reduces swelling	'Prophylactic'
Heals skin rash	Reduces phlegm	Relaxes muscles
Regulates weight	Enhances energy	Relieves fatigue
Calms down	Mentally relaxing	Relieves stress
Improves self- confidence	Improves mood	Relieves depression
Puts things in perspective	Induces philosophical thinking	Improves tolerance
Diverts attention from problems	Relieves social anxiety	Induces cheerfulness
Improves focus and concentration	Causes laughter	Improves reflecting
Expansion of consciousness	Clear mind	Calms racing thoughts
Prevents anxiety	Relieves nervousness	Mental balance
Relieves anxiety	Deeper thoughts	

### 2.2.1 Physical effects

According to my participants, cannabis induced the following physical effects, amongst others: physical relaxation, increased appetite, relief of stomach cramps, pain relief, etc. (see **table 26**).

*“Once, I was very sick and I had to throw up. My entire body was burning because of the chemotherapy. My eyes, nose, mouth,... So I thought “goddamn. What the hell”, I took ten drops of [cannabis oil] in one time. It was unbelievable, everything was gone. I could*

*not believe it, neither could my wife. Thirty minutes later, I was like “What are we going to do?”, my wife replied “You weren’t feeling well you said”. I said “It is gone, it stopped.” [Bruno/M/55]*

The most frequently reported physical therapeutic effect by my sample was pain relief. Next, a large group of respondents reported that cannabis caused physical and mental relaxation, which had a positive influence on other symptoms. Another commonly reported effect caused by cannabis was the ability to fall asleep and to have a good night’s sleep, because of a deeper sleep and/or because of pain relief. The improvement of sleep was important for multiple respondents, in particular for respondents dealing with sleep disorders, but also for those who suffered from insomnia due to pain issues. When these participants had a good night’s sleep their conditions were also better during the day. Similar to the study of Athey et al. (2017) cannabis was not always needed for its sedative effects, but because it counteracted the underlying causes of sleep problems, interviewees reported they were able to fall or stay asleep more easily.

### 2.2.2 Mental effects

Interviewees mentioned a large variety of mental effects caused by cannabis. While most physical effects were therapeutic to my respondents, many more of the mental effects were considered not (as) important for therapeutic purposes. In this section I discuss all the mental effects reported by the interviewees. The importance of these effects will be covered in one of the following subsections (see 2.2.2.4 The value of the mental effects of cannabis).

Many respondents mentioned that cannabis relaxed and calmed them down. Next, multiple participants spoke about the fact that cannabis influenced their thoughts. It improved focus, concentration and alertness through the ability to side-track other thoughts. According to some of my interviewees, cannabis changed and improved their thinking, expanded their consciousness, enabled them to put things in perspective, and gave them another perspective on life in general. Some respondents noted they felt more cheerful and happy due to cannabis overall.

A number of interviewees noted that cannabis enhanced their creative productivity (e.g. drawing). According to several, cannabis leads to people opening up and therefore one becomes more social. A few participants thought cannabis had spiritual and meditational effects. Cannabis made some think that everything around us is more beautiful, in particular nature. Participants reported having different experiences when walking in natural environments under the influence of cannabis than when being sober. The beauty of nature was experienced on a deeper level and therefore more enjoyed. This connecting with space in relation to natural environments was described by Duff (2008), to illustrate that drug use goes beyond generating physiological effects, which one might enjoy. Due to the use of cannabis, certain activities were performed and experienced differently depending on the context. For

instance, the increased appreciation of the arts such as listening to music, watching movies, attending concerts and reading a book.

Other interviewees claimed never experiencing any psychological effects. Explanations cited by my interviewees were the low doses and/or the low potency of their cannabis products. Two of them were women with young children who thought it was irresponsible to be intoxicated when their children were around. **Marie (43)**, used CBD oil as a prophylactic treatment in order to prevent breast cancer from developing, because she had a strong family history of breast cancer. In addition, she also experienced dysmenorrhea, but she was not thinking of using cannabis products which hold THC to combat pain, because of possible psychoactive effects.

*I: “You never thought of using cannabis for your pain?”*

*R: “I did, but my son is around all the time. Imagine that there is a fire and I start laughing really loud because I’m stoned... You have to take care of your responsibilities. You are a little bit mellow, that is one thing, but you are also a little bit slower. I think that you can’t have that with a child, because you have to be constantly alert, especially with a three year old.” [Marie/F/43]*

#### *2.2.2.1 Developing tolerance to the mental effects of cannabis*

Self-reported psychoactive effects induced by drugs are complex and difficult to assess. The fact that some participants reported that they experienced psychoactive effects change over time adds to this complexity. Using cannabis consistently on a regular basis (e.g. daily), appeared to make medicinal cannabis users (more) tolerant for its psychoactive effects. Because of tolerance, the psychoactive effects were not as intense as the experiences at the beginning of use. For example, three respondents said they did not get the ‘munchies’ (i.e. increased appetite) anymore as they had in the beginning. Some participants stated that it was impossible for them to get (really) ‘high’ any longer.

#### *2.2.2.2 The mental effects of cannabis are equal to side effects*

More often, the (more intense) psychedelic effects of cannabis came up when interviewees discussed the side effects caused by cannabis. In this respect, **Dirk (65)**, who suffered from sleep problems, made a remarkable comment about the psychoactive effects of cannabis. For him, the psychoactive effects of cannabis were equal to “*recreational effects*”. When he referred to the psychoactive effects of cannabis he systematically used the term ‘recreational effects’ or “*effects that are sought after by recreational users*”. These “*effects experienced by recreational users*” were equal to the side effects he experienced in the initial period of his use.

Multiple respondents preferred to use cannabis products without psychoactive properties. **Anny (58)**, who suffered from chronic arthritis pain, thought that the mentally relaxing properties of cannabis were therapeutically valuable and stated that the psychoactive effects were enjoyable at times. However, she

believed that these effects were not indispensable, and that too much psychoactivity was unpleasant. **Isabelle (46)**, living with scoliosis, had no experience with using cannabis, but wanted to try it because her standard pain medication caused intolerable mental side effects:

*“They reassured me immediately if you experience mental changes, those are adverse events. Side effects, that will go away within fourteen days.” [Isabelle/F/46]*

Other participants did not dislike psychoactive effects and some even thought they were quite enjoyable. These were mainly interviewees who used cannabis for recreational purposes as well. **Maarten (37)**, who was almost completely paralysed below the neck, appreciates the mind-altering properties of cannabis and considers them as therapeutic:

*“CBD oil might help against pain, but I also like using recreationally. To feel a bit mellow, I think that's nice. Then there is nothing anymore that hurts and all my stress is gone. I've never tried it, but I think if I would try CBD oil, then I do not have that buzz. And actually, I don't want to have to miss this, because in a way I like it.” [Maarten/M/37]*

**Mary (58)** suffered from severe physical injuries associated with a car accident. The psychoactive effects appear to help her to cope with the consequences of having to live with chronic physical health problems.

*“You don't realise how good it is to use cannabis! [laughs] Otherwise I would be sitting here the entire day with a sad face, right? I have to take care of my life man. The system can come and have a look here. I didn't ask for this [medical condition]. I loved to work and I did everything that I had to do. I choose for my own life, someone else does not have to decide upon it.” [Mary/F/58]*

**Armand (50)**, using cannabis for ADHD and Tourette syndrome, argued that the experience of using cannabis is no different from taking conventional medicines. He challenges the stigma that is associated with achieving an elevated mood (euphoria or enhancement) by using a psychoactive substance, in contrast to achieving recovery, which is defined as a return to a normal state of health, mind or strength.

*“I feel that I've used medication, but I'm not stoned you know. You still feel something, but you also feel it when you have taken Ritalin® or paracetamol. What is the difference? It's a side effect, but it is more fun than others. Do I have to feel guilty about this? No. Do I have to feel guilty because I finally found a medication, which not only makes me feel better, but also makes me feel good or even better than good?” [Armand/M/50]*

Whether respondents liked or disliked the mental effects of cannabis, depended on the intensity but also clearly on the setting and the context. More often, during leisure times, respondents enjoyed cannabis' psychedelic effects (e.g. feeling 'high'), however at other times when they needed to be functional they preferred a clear state of mind and only wanted their symptoms to be relieved.<sup>25</sup>

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<sup>25</sup> See PART IV Empirical results: Chapter 3 section 2.2.1 “I need to function”

### 2.2.2.3 Stages of intoxication: 'high' and 'stoned'

During the interviews the terms 'high' and 'stoned' were used most often to describe the more intense psychoactive experiences caused by cannabis. The terms were mainly used in the context of non-medical cannabis use.

The meaning of these stages of intoxication was mainly explained by the influence of cannabis on the functions of the brain. Multiple respondents distinguished between the terms 'high' and 'stoned' with regards to sensations. The 'high' was mainly associated with increased activity and energy, mind-altering effects, (inability to stop) laughing, losing control, talking nonsense, consciousness expansion, hallucinogenic effects, head in the clouds, etc. On the opposite side, feeling 'stoned' was linked to relaxation (being non-active). Feeling 'stoned' was described by being lazy, falling asleep more easily and calming effects ('couch lock').

The concepts 'high' and 'stoned' were interpreted and defined differently by my interviewees. When respondents were asked to explain these subjective sensations of intoxication, some of them encountered difficulties to put into words what these experiences felt like. The narratives of **Rosa (63)** and **Isabelle (46)**, who both used cannabis to alleviate pain and had no experience with recreational cannabis use, are illustrative:

*I: "You said you become high because of cannabis in the evening."*

*R: "Yeah high..., I mean, I think it is a high. Because I don't have a history with cannabis, my daughters they do, but I don't [laughs]. Uhm, how should I explain this? You get a very strange feeling in your head, your mind gets confused." [Rosa/F/63]*

*I: "What do you mean exactly when you say 'stoned'?"*

*R: "I don't know, stoned... What is stoned? Now that you ask me this question I don't even know what I should answer to it. For me, being high or stoned... [thinks] I really don't know, because I don't experience it [laughs]." [Isabelle/F/46]*

While Rosa was unsure whether she felt high, Isabelle was confident that she never had this experience. This illustrates that identifying and interpreting the experience of the 'high' has to be learned (Becker, 1953). A number of interviewees even encountered difficulties in describing the psychoactive effects of cannabis in general. Those respondents were many times individuals who had no experience with recreational cannabis use prior to their medical use. They could not easily explain the mental effects of cannabis because they never experienced them, or they did not know how to interpret them. Most of the time those respondents did not distinguish between the terms 'stoned' and 'high', or used them interchangeably to describe others' presumed experiences. This finding can be explained by the social learning theory of Becker (1953), who argues that novice users need to learn to identify the psychedelic or pleasurable effects.

Multiple other interviewees mentioned that they felt 'high' or 'stoned' (at times) when using cannabis medicinally, including interviewees who never used for recreational purposes. For example **Maria (58)**, who used highly concentrated cannabis oil in the hope to fully cure breast cancer, said she got "very

high” every time when using this oil, but that she also slept good. Twelve respondents declared that they felt lightheaded, mellow or more mentally relaxed, when using certain cannabis products, but noted that this feeling was not the same as being ‘high’ or ‘stoned’. These respondents acknowledged the fact that cannabis caused psychoactive effects, but that these experiences were less intense than the two well-known stages of intoxication. On the opposite side to these attitudes, **Lode (39)** considered feeling lightheaded already as being ‘high’. Also **Anny (58)** thought that feeling ‘high’ was already equal to all kinds of ‘*hallucinogen effects*’. Three participants explained that it is possible to adjust the dose of cannabis according to whether or not you want to experience psychoactive effects or achieve a ‘high’.

A subset of respondents stated that they never experienced a ‘high’ (anymore) when using cannabis (for medical purposes). This was likely due to their limited experience with recreational cannabis use, the type of method of ingestion, the type of cannabis product, their set and/or the setting (Zinberg, 1984). In addition, several interviewees stated explicitly that the purpose of using cannabis was not for relaxation nor to become ‘high’ or ‘stoned’. The ‘high’ was (firmly) disliked by a number of my participants. This was clear by participants who tried to circumvent the ‘high’. For instance, **Nicole (45)**, suffering multi-morbidity, ordered a natural brain nutrient online to counteract the ‘high’, which she experienced in the beginning of her use. **Bea (55)** was convinced that she needed high THC concentrations to treat her autoimmune skin disorder. She made cannabis oil herself from which she made suppositories. She thought that by using this administration method she might be able to avoid feeling ‘high’. Multiple other interviewees knew tricks to counteract or lessen unwanted psychedelic effects (e.g. consuming sugar or CBD products). The ‘high’ also came up in the context of overdoses, which indicates that the ‘high’ was considered as a side effect. More often, people referred directly to the ‘high’ as an adverse event.<sup>26</sup>

#### *2.2.2.4 The value of the mental effects of cannabis*

The fact that cannabis affects the functions of the brain was probably most valuable to participants who used the substance for mental health problems (e.g. ADHD, depression, Tourette syndrome, PTSD, bipolar disorder, etc.). The ways through which cannabis helped tackling those psychological problems differed between the interviewees. Interviewees reported that cannabis relaxed and sedated, but also helped against sadness and symptoms of depression. Three participants stated that cannabis helped them with anger management and aggression issues, due its calming effects. A number of interviewees were glad cannabis enabled them to cope with daily life and with fears of the future. It gave them a sense of peace when their minds were filled with stressful thoughts. For some interviewees who were suffering mentally, cannabis appeared to be an escape from their emotional discomforts. Cannabis helped them to distract their thoughts temporarily from their chronic health problems and traumatic experiences. For a while, interviewees “*forgot*” and were no longer preoccupied by their physical and mental health

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<sup>26</sup> See PART IV Empirical results: Chapter 2 section 2.2.3 Side effects



problems. This way, cannabis helped individuals who had sleep problems due to mental health problems to fall asleep more easily.

To illustrate the complexity of using cannabis as a treatment for mental health purposes, I will discuss now a few cases. **Sandra (42)** smoked cannabis to cope with her trauma of being sexually abused as a child and self-medicated for ADHD. **Carl (29)**, suffering from a bipolar disorder, stated that cannabis helped him to fall asleep when having mania. It reduced his anxiety and helped to put things in perspective when he felt depressed. **Paul (59)**, a former ambulance officer, stated that cannabis helped him to cope with PTSD, which was caused by being exposed to trauma at his job. Cannabis distracted his thoughts from the traumatic experiences. **Patrick (54)**, who was socially isolated and suffered from schizophrenia and lung cancer, describes how cannabis enables him to mentally distance himself from his daily concerns and to cope with life stress:

*“If you smoke and you have a high, you will not put things in your head. All your problems are gone. Not gone, but you are no longer bothered by them, so to speak. However, you can’t solve your problems by taking cannabis.” [Patrick/M/54]*

**Rudy (55)**, dealing with chronic back pain and depression, was not sure if cannabis was beneficial for the latter. He used a cannabis strain that made him feel less depressed, but at the same time this strain caused a ‘couchlock’ effect which made him stay inside most of the time. Social isolation and physical inactivity were detrimental for his depression. On the other hand, he believed that another cannabis strain would make him more energetic but might be less directly effective for depressive symptoms.

**Armand (50)**, who suffered from Tourette Syndrome was confronted with many setbacks during his life. He started narrating his tragic life story by noting that he was a child of alcoholics and that he lost his two sisters because of alcohol problems. He did not possess a diploma and was unemployed at the time of the interview. He had a son who was living with Tourette Syndrome as well. His daughter became disabled due to a broken neck which led to a long and intense legal process. Armand stated that self-medicating with cannabis helped him to get through all of these problems. Finally, **Ine (30)** claimed that because of cannabis she was able to cope with her depression and burnout. She worked long hours as an engineer and took care of her disabled partner. In addition, she reported having an alcohol addiction in the past, and said that cannabis had helped her to use psychoactive substances in a responsible manner.

To some participants cannabis was a holistic treatment, as it was beneficial for multiple aspects of their health. A number of respondents explained that the psychotropic effects of cannabis were beneficial for relieving particular physical complaints, such as pain. They stated that stress can cause many physical side effects and that cannabis is efficacious in relieving stress by its relaxing properties. According to these participants, cannabis is able to tackle the cause of these symptoms in contrast to other conventional medicines.

**Roger (53)** treated his cluster headaches with cannabis, but he was doubting if his cannabis use could be called medicinal because he used ‘acceptance’ and ‘distraction’ as mental coping strategies for his pain. His narrative illustrates the perceived superiority of physical effects over mental effects.

*“Is it medicinal? Strictly speaking, I would say no, because it doesn’t improve my pain. But I think it allows me to deal with it, and in that sense it is like a painkiller. A painkiller doesn’t heal me, it only allows me to deal with pain. The pain is still there, but I become one with my pain and then it disappears. So, I dive into it, actually strengthening my pain. Which is a bit weird, a bit masochistic, but yeah. You can ask yourself if you use those things to escape reality. That’s difficult, because I use cannabis to escape from my pain. Who is going to judge this?” [Roger/M/53]*

Using psychoactive drugs with the aim of escaping reality is generally assumed to be a risk factor for drug misuse (Chapkis, 2007). However, for Roger the possibility of escape appears to be positive, since it enables him to cope with having to live with chronic health problems.

Roger was not the only respondent who explained through which specific ways his pain lessened, which went beyond strictly physical effects. For some, mental processes appeared to be (almost) equally important. Cannabis enhanced awareness of the body and the self which was therapeutically beneficial. One female respondent, **Carine (46)**, told that she could send cannabis to the body parts where she experienced pain due to arthrosis. Two other respondents observed that cannabis first shows the body parts that are in pain by tingling and then reduces that pain. Another way reported by my participants was pain relief through relaxation. Participants noted that relaxation is beneficial for physical health problems, since stress can cause or exacerbate them. Next, interviewees spoke of the ability to tolerate pain because of the mental influence of cannabis. Multiple respondents reported the phenomenon of pain relief through mental distraction by cannabis, i.e. if you do not think about pain you will experience it less. Cannabis made it possible for participants to distance themselves mentally from their pain and to focus on things other than their symptoms. More often, participants experienced difficulties when expressing these mental processes and believed it “*sounded strange*”. **Magda (64)** and **Rosa (63)** capture what many express when they say:

*“When you are in severe pain you can’t do anything. You are just sitting there, only thinking about the pain. Cannabis helps you to relax and you are more distanced from the pain. The pain isn’t completely gone, but you kind off forget it. You are not constantly preoccupied with it, otherwise you are like “What can I still do to lessen it? Should I do this or that...?” It’s hard to explain.” [Magda/F/64]*

*“Because of cannabis you are able to take a distance. The pain is still there, but I don’t experience it that way. It is as if I am watching myself who is in pain. It is really odd that the pain which I experience normally, that disappears. However, under this pain there is other pain, which I definitely feel and I think that’s very bizarre. So the pain which I have all the time is reduced or gone, but underneath there is a pain which I cannot eliminate. So it is still there and seems to be the cause of other pain... What I’m telling sounds ridiculously, I know.” [Rosa/F/63]*

The literature suggests that the psychoactive properties of cannabis would be partially responsible for its subjective medical benefits on physical symptoms (Grotenhermen & Schnelle, 2003), and thus important for therapeutic purposes. Some of my participants were convinced that cannabis enables one to better cope with physical health problems through its mental effects. **Philip (41)** who suffered from tinnitus offers an example of this coping strategy:

*“I have tinnitus. Especially during calm moments or when it is really quiet, I’m bothered by it. Then it whistles. If there is some sound or when I’m doing things, then it isn’t really there, because you don’t pay attention to it. When I smoke a joint, then the sound is still there but you no longer concentrate or focus on it. In your thoughts you are occupied with other things, so you don’t pay attention to the sound. It distracts your attention from the sound, so the speak. The sound is always there, but then it doesn’t bother you anymore. That’s very weird.” [Philip/M/41]*

Multiple interviewees in this study dealt with severe and/or chronic physical conditions (e.g. cancer and chronic pain) which had a negative impact on their mental health (e.g. depression). For some of these interviewees, cannabis was a remedy for coping with these mental health problems as well as the underlying physical health problems. **Bruno**, a 55-year-old man who used cannabis in the hope it would cure his prostate cancer, stated that when he used cannabis he met his demons and was confronted with deeply buried pain. This way, by reflecting and putting things in perspective, it helped him through his grief. He was convinced of the fact that cannabis prevented him from needing psychological counselling, since it helped him to cope with mortality salience evoked by cancer. When he felt distressed he took a couple of drops of cannabis oil.

*“You know what the worst thing is in life you go through? The day when you realise “I’m mortal and I got one foot in the grave” Man, that hit me hard, not a good day I can tell you. Then I cried and had to smoke joints [...]. The first proof of cannabis’ effectiveness was when I could eat again, the second when I could dance again. The next was my mind. It’s incredible, you have to have it tried yourself, especially when you are severely ill. I think of it as a person that helps me. This Thursday, at the doctor’s office then I will hear it: dead or alive, that is how you have to look at it with cancer. So normally, I would be sitting here very nervous, but because of cannabis... nothing” [Bruno/M/55]*

**Jolien (25)**, who was diagnosed early in life with MS, observed that cannabis helped her to cope with receiving the diagnosis and accepting dramatic life changes.

*“I can say that cannabis kept me alive in the beginning of my disease, just mentally. Because it was a real battle in my head. I had a lot of dreams, and all of a sudden those weren’t possible anymore. I was struggling very hard with myself. So I dare to say that it kept me alive. It helped mentally to put things in perspective. In addition, in the beginning it was hard for us to get cannabis. So sometimes I had nothing for a couple of weeks. Mentally, this was really hard.” [Jolien/F/25]*

A number of participants said that they did not experience any psychoactive effects such as the “high”, however at the same time they reported subtle mental effects, which were more often identified as

positive for their well-being. **Thomas (35)** used a small dose of cannabis oil for his back pain, because he disliked the psychoactive effects caused by cannabis. However, he noticed that he was calmer and fell asleep more easily after having used cannabis. Previously he stayed awake because of work-related stress. **Hendrik (78)** was another participant who believed that cannabis did not affect his mind. However, his wife and son believed he was calmer since he started using cannabis. Overall, he seemed to struggle with accepting his irreversible progressive disorder COPD:

*“They say I’m calmer, I’m not going to argue with that, but I don’t notice that I’m calmer since I am using cannabis. I don’t want to notice that I’m becoming more calm, because there will be a day that I will no longer be.” [Hendrik/M/78]*

Some participants stated that their mental health improved indirectly only because their physical health improved because of cannabis, but they did not experience mental effects from taking cannabis. Two respondents reported that the reason for wanting to try cannabis as a painkiller was because they experienced severe adverse mental effects from their usual pain medication. Unlike some others, a clear state of mind was a precondition for them to continue using cannabis as a treatment.

### 2.2.3 Side effects

Interviewees reported few unwanted side effects induced by cannabis. Most adverse effects were considered less severe than those of conventional medicines. Multiple respondents said that they could still function well after consuming cannabis, and that their normal activities were not impaired by it. Some mentioned that they functioned even better after using cannabis. In contrast, two interviewees reported impaired functional ability after smoking cannabis (e.g. coordination impairment). Most participants indicated that they did not experience adverse events from cannabis when they woke up in the morning. Instead of having a “*hang-over*” they were well rested. On the other hand, three respondents noted that they experienced problems when waking up in the morning when using particular cannabis products in the evening.

Answers varied when participants were asked which side effects they experienced because of cannabis. A number of participants claimed that they currently did not experience any side effect. The second group thought that there were some side effects, but these were not considered to be problematic nor negative. The following unproblematic side effects came up during the interviews: dry mouth, laughter, feeling happy, increased appetite, increased heart rate, dizziness and being easily distracted. When asked about having a dry mouth due to cannabis, two respondents replied that they only needed to drink a sip of water.

*“The worst that can happen is that you fall asleep on your couch or that your fridge is empty in the morning. I mean there are worse things you know” [Philip/M/41]*

Some of the effects mentioned above, alongside others, were experienced as negative by other respondents, including: dry mouth, feeling ‘high’, increased appetite, memory problems, bad taste, dizziness, blackouts, multitasking problems, drowsiness, couch lock, etc. Increased appetite, memory problems/blackouts and experiencing psychoactive effects such as feeling ‘high’ or ‘stoned’, were adverse effects reported more often by my interview sample. In the context of cannabis’ side effects, several respondents mentioned that it is important to limit the amounts of THC consumed. One respondent recalled having bad experiences with high THC level cannabis strains because it induced anxiety attacks.

Two respondents had a traumatic experience (presumably) due to the use of cannabis. The first respondent is **Helena (60)**, suffering from cancer, who developed a herpes infection during the time she was using cannabis oil, and because of which she ended up in hospital. At the time of the interviews the consequences of this severe infection were still visible in her face. She suspected that she had gotten infected by taking cannabis oil, because the composition of her usual cannabis oil had changed (high increase of CBD), without her knowledge. Suddenly, she received a different bottle than usually from the online web store where she ordered all her cannabis products. The other participant, **Maggy (44)**, stated that she had a severe panic attack due to an overdose of cannabis oil.

Some respondents expressed a nuanced interpretation of the concept ‘side effect’. For one of them the ‘high’ was a side effect because the purpose of his use was not to become high. While side effects have a negative connotation in general, my interviewees also referred to side effects of cannabis without them necessarily being negative. For instance, **Leo (54)**, using cannabis as a prophylactic treatment thought that the impact of cannabis on his thinking patterns was “*an unproblematic side effect*”. **Dirk (65)**, who smoked cannabis for insomnia, thought that the beneficial influence of cannabis on his depression was a “*positive*” side effect. Five respondents spoke of the “*pleasant*” side effects (e.g. feeling happy, laughing, etc.) of using cannabis as a medicine. **Helena (60)**, who used cannabis with the hope it would be curative for her cancer, thought of the influence of cannabis on her mood as a positive side effect:

*“I thought that the cannabis had pleasant side effects. Once in a while I was laughing and yeah I felt very good and very energetic and happy.” [Helena/F/60]*

An adverse effect reported by one person is not always considered a side effect by others. Other people might even pursue this effect for therapeutic purposes. For instance, interviewees dealing with insomnia did not think of drowsiness as an adverse effect, while some other interviewees did. **Paul (59)**, who suffered from diabetes and who was overweight, thought that increased appetite was a major disadvantage of using cannabis as a painkiller. Two female respondents mentioned that the craving for sweets was a bothersome side effect, because they had put on weight. On the opposite side, three other interviewees considered increased appetite as a positive therapeutic effect, since they were underweight due to their medical conditions. Two cancer patients who underwent chemotherapy and experienced CINV, valued the fact that cannabis helped them to eat. Other respondents never experienced increased

appetite due to the use of cannabis. It was common that certain interviewees did not experience (side) effects reported by others.

Even on the individual level, the same effect was considered adverse at one time, while beneficial at other times. Whether effects were considered side effects or desired effects depended on the context, including interviewees' activities and the time of the day.<sup>27</sup> **Tom (37)**, living with PTSD, used CBD oil only in the morning to be able to focus. He never used it in the evening since he could not fall asleep after using it, because of being too focussed.

*I: "Previously you spoke of side effects, but what do you think are side effects of cannabis?"*

*R: "That depends on the time of the day. I mean sleepiness in the evening is not a side effect but during the day it is. A side effect is an effect that is undesirable or not the effect that you aim for and that does not fit at that particular moment. Most medications have side effects, this means weighing the pros and the cons." [Tom/M/37]*

### 2.2.3.1 Overdosing

A number of respondents mentioned that it had happened that they used "too much cannabis". Several times this was an accident, due to nonchalance (e.g. "taking a drop too much" or "a too big lick" of cannabis oil), or when searching for an appropriate dose in the initial stages of using cannabis. Overdosing with cannabis was identified by experienced effects, and these included well known 'side effects' of cannabis and effects typical of a drug overdose (e.g. dizziness, sweating, anxiety, panic, palpitations, hallucinations, paranoia, etc.). In addition, more often the psychoactive effects of cannabis came up when respondents spoke about times when they had used "too much", such as feeling "high" or "stoned". Overdosing with cannabis was experienced negatively by the participants.

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<sup>27</sup> See PART IV Empirical results: Chapter 3 section 2.2.1 "I need to function"

### 3. Discussion

#### 3.1 Efficacy and quality of life

Consistent with other studies (e.g. Swift et al., 2005; Lintzeris et al., 2018; Zaller et al., 2015; Ware et al., 2005; Walsh et al., 2013; Boehnke et al., 2019) perceived effectiveness of cannabis was high among my participants, and there were no inconsistencies across participants' symptoms. The widespread self-reported efficacy of herbal cannabis for many of the conditions reported by my participants is currently not supported by clinical evidence (Kowal et al., 2016). While particular cannabinoid products (e.g. Sativex® and Marinol®) are proven to be effective and safe in treating certain conditions such as neuropathic pain, CINV and spasticity in MS (Whiting et al., 2015; Allan et al., 2018), evidence coming from clinical trials showing the efficacy of herbal cannabis (extracts) for many of the conditions reported in the present study is limited or even non-existent. In the current study cannabis was mostly used for chronic pain. There is growing clinical evidence that shows that cannabinoid drugs are potentially effective analgesics (Whiting et al., 2015; Allan et al., 2018), however most evidence today supports the treatment of neuropathic pain (Boehnke et al., 2019). There is urgent need for more high-quality clinical research that provides knowledge on the side effects, efficacy and safety of cannabis treatments.

Among the interviewees, perceived efficacy was based on their own experiences and judgements. Most participants indicated in the survey, as well as in the interviews, that complaints improved but no complete alleviation was achieved. Although interviewees were positive with regards to cannabis' efficacy and side effects, they stated that cannabis mainly suppressed symptoms and was unable to eliminate them. The interviews illustrated this was also true for (chronic) pain, the most common condition and symptom among my participants. Still, interviewees were satisfied with cannabis since their pain reduced with a minimum of adverse effects, and therefore their pain became bearable. The finding that cannabis reduced chronic pain, aligns with previous studies looking into self-reports of medicinal cannabis users regarding the therapeutic efficacy of cannabis (Boehnke et al., 2019; Zaller et al., 2015).

Consistent with previous research, the present study suggests that one single individual medicates with cannabis for multiple symptoms and conditions (Athey et al., 2017; Swift et al., 2005; Grella et al., 2014; Reinerman et al., 2011; Walsh et al., 2013). The fact that cannabis yields multiple therapeutic benefits indicates that cannabis is used more as a holistic treatment in contrast to single-target drugs. The interviews revealed that cannabis is mostly being used for symptom management, to improve (e.g. mood), to alleviate (e.g. pain) and to prevent (e.g. spasms) symptoms. Interviewees' reports suggest that more often cannabis did not improve a particular health problem directly, but its effects enabled participants to cope with it (e.g. pain relief through mental distraction), or improvement was achieved indirectly. For other conditions (e.g. insomnia), cannabis tackled their underlying causes (e.g. pain). Only a few interviewees used cannabis in the hope of curing their conditions, and these were mainly cancer patients. Preclinical studies show that cannabinoids can decrease tumour growth in animal and

in vitro models (Velasco et al., 2016; Ladin et al., 2016; Śledziński et al., 2018). However, clinical research analysing the safety and benefit of cannabinoids as anticancer agents is still in its very initial phase and there is currently no conclusive clinical evidence that supports that cannabinoids can effectively and safely treat cancer in humans (Hazekamp, 2018). In recent years, very few clinical studies have been conducted to assess the safety and the potential clinical benefit of cannabinoids or cannabinoid-based preparations in cancer (e.g. glioblastoma) (Velasco et al., 2016; Śledziński et al., 2018). Currently, cancer patients are mainly relying on anecdotal evidence that is spreading rapidly throughout the internet. This is not without risks, as a lot of these stories and claims about ‘cannabis cures’ are false, unfounded and misleading (Shi et al., 2019).

The survey results show that the majority think that their quality of life has improved significantly because of cannabis. The fact that only a small group of the survey participants indicated that their quality of life was fully restored was reflected in the interview results. While most interviewees reported a positive impact of cannabis on their lives, the extent of this impact ranged widely. An important question concerns in what particular ways cannabis influences patients’ quality of life. My results showed that using cannabis goes beyond targeting a single symptom and that it affects people’s quality of life more indirectly. Cannabis was mainly used to suppress symptoms, and therefore people were less limited by their conditions. Participants whose symptoms were relieved by cannabis were able to function and to carry out everyday chores (cf. Dahl & Frank, 2011). The interviews also illustrate that individuals’ quality of life indirectly improved because they were able to reduce reliance upon conventional medicines that caused more (severe) adverse events than cannabis. The psychoactive effects of cannabis were important in themselves for the quality of life of individuals using cannabis for psychological purposes.

The findings in this chapter show that self-identified medicinal cannabis users are positive regarding the efficacy and side effects of cannabis. Nevertheless, most of the time cannabis is not used as a cure, it did not restore participants’ quality of life nor did it relieve their symptoms completely. Although participants’ attitudes towards medicinal cannabis use were very positive overall, most of the interviewees did not make unrealistic statements regarding cannabis’ therapeutic potential. Based on their own experiences they acknowledged cannabis’ limitations and did not portray the substance as a panacea.

### 3.2 Side effects

The majority of the ‘adverse’ effects of cannabis found in previous research were not experienced by more than half of my survey sample. Many of these well-known side effects and health risks of cannabis are based on findings from studies in recreational cannabis use populations (Wang et al., 2008). There are multiple indications that medicinal cannabis use patterns differ from recreational use patterns. This current study and other research suggest that medicinal cannabis users are daily users, whereas



recreational cannabis use levels are lower (Sznitman, 2017; Lin et al., 2016; Pacula et al., 2016; Roy-Byrne et al., 2015; Zaller et al., 2015; Goulet-Stock et al., 2017). It is possible that certain effects were not experienced by self-identified medicinal cannabis users because of tolerance due to their high frequency of use (Grotenhermen & Müller-Vahl, 2012). Next, administration methods and the composition and strength of cannabis products used for medical purposes might differ from the ones usually used among recreational cannabis users. Other studies found that medicinal cannabis users are less likely to administer cannabis through harmful administration methods such as smoking and more likely to more likely to utilise healthier routes of administration such as vaporisation and edibles (Sznitman, 2017; Pacula et al., 2016). This is another possible explanation for the differences in self-reported side effects, which needs further serious exploration.

Although the listed effects in the survey are well-known ‘side effects’ of cannabis, participants indicated some of them had a positive impact on their quality of life. Drowsiness was considered positive by the majority, which is unsurprising since more than half of the participants use cannabis for sleep problems. In public and policy discourses, the adverse effects and health risks of cannabis are often emphasised to illustrate its potential hazardousness. Much less attention is spent on pleasurable sensations (Lancaster et al., 2017; Dwyer, 2008). Self-identified medicinal cannabis users that participated in the interviews reported few adverse effects. Furthermore, some of the side effects which they did experience were not always considered bothersome. In the interviews participants spoke of “*non-problematic*” and “*pleasant*” side effects. The variation in participants’ neutral, positive and negative attitudes regarding cannabis’ side effects, confirms the subjectivity of ‘desired’ and ‘side effects’ produced by a drug. Becker argues that side effects “are not a medically or pharmacologically distinct category of reactions to drugs” (Becker, 1973, p.27). The importance of the context in which cannabis is used, for side effects to be considered negative, was illustrated by the interview findings.

The relatively low number of side effects reported by the interviewees echo the survey findings. Short-term effects considered more often negatively by my interviewees were increased appetite, memory problems/blackouts and experiencing psychoactive effects, such as feeling ‘high’ or ‘stoned’. Self-identified medicinal cannabis users in this study reported chronic and high frequency of cannabis use over a prolonged period, which might increase the risk of harmful long-term effects. At the present moment, the long-term effects of using certain cannabis products, such as highly concentrated cannabinoid extracts, are unknown. There needs to be more clarity regarding this issue, and users and health care providers should be informed about cannabis products’ short- and long-term risks.

Similar to the work of Becker (1973), the interview data in the present study show that the categories of ‘main’ and ‘side’ effects are subjective and personal (Pedersen & Sandberg, 2013). Side effects’ of cannabis are not always found bothersome and can even be desirable. This illustrates the wide variety of different types of effects caused by cannabis and the versatility of using cannabis as a treatment. It is important to note that it would be incorrect to speak of ‘the’ side effects and ‘the’ therapeutic effects of cannabis. The variety in cannabis (based) products continues to grow rapidly. These products vary widely in chemical content, and users consume them in different doses and with various ingestion

methods. This means that the experienced effects will vary as well (MacCallum & Russo, 2018). When research further develops there will be more clarity and nuance regarding the effects produced by specific cannabinoids and cannabis products, which will have to be translated into policy and practice.

We have to remain careful regarding the positive attitudes of my sample regarding the therapeutic effects and side effects of cannabis, because of the limitations of the study design.<sup>28</sup> More population-based and clinical research into the risks and side effects of cannabis among medical cannabis populations is necessary. Further in-depth research is needed to look into the role of the psychoactive effects in medical treatments and to document patients' experiences with these effects.

### 3.3 Psychoactive effects

Consuming drugs in an uncontrolled and irresponsible manner may lead to problematic drug use and addiction, which might in turn cause deviant behaviour. It seems to be important in the interest of society that people discipline themselves regarding the use of psychoactive drugs. Using socially accepted psychoactive drugs is tolerated and legitimised as long as an individual obeys the law and is able to function normally in society. Drugs' psychoactive effects remain taboo, especially when a drug is used for medicinal purposes. The sensitiveness of this topic might lead people to be hesitant to answer honestly and increases social desirability bias. In order to gain acceptance for their use, medicinal cannabis users might downplay the importance of the psychoactive effects of cannabis.

The survey data suggest that most participants who have experienced a 'high', did not think of it as an adverse effect when using cannabis for health purposes. Furthermore, more than half of my survey sample think that the 'high' is therapeutically valuable and enjoy this sensation. This is an important finding since most medical research categorise the 'high' as an adverse effect that has to be avoided (Trigo et al., 2016). When referring to the therapeutic window of cannabis, which means achieving the greatest therapeutic benefit without resulting in unacceptable side effects, patients are advised to use enough cannabis to experience therapeutic benefits but not so much that they would feel 'high' or experience significant euphoric effects (MacCallum & Russo, 2018; Mouhamed et al., 2018). These dominant discourses of powerful and eminent authorities might lead patients to experience psychoactive effects negatively because they have learned to think of them in this way from respected physicians (Becker, 1973). The positive attitudes of my survey sample regarding the psychoactive effects of cannabis is likely due to the high number of (former) recreational users among the sample. Among exclusively medicinal cannabis users and in the interviews the psychoactive effects were more often found bothersome, especially by novice cannabis users.

In the interviews I found multiple explanations for the fact that there are medicinal cannabis users who have never been 'high' while others have experienced a 'high'. First, some individuals consume products

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<sup>28</sup> See Part III Methodology: a mixed methods approach, section 5. Research limitations.

that are non-psychoactive because of their chemical constellation (low THC levels). Other interviewees reported using small dosages that are less likely to induce psychoactive effects. Second, the interviews illustrate that psychoactive effects are not easily explained, as they are experienced and interpreted differently. Participants described various stages of intoxication and give different interpretations to these feelings, but also to the meaning of the concept of a 'psychoactive effect'. Especially the concepts of 'high' and 'stoned' were given diverging explanations by my participants. It was clear that while some participants spoke extensively and in-depth about these mental effects, others only touched upon these experiences or reported not experiencing any mental effects. Psychoactive effects do not only depend on the drug itself, but also on the social setting in which the drug is used and the mental state and knowledge of the user (Becker, 1953; Becker, 1973; Zinberg, 1984).

Half of the survey participants who had never used cannabis recreationally reported never experiencing a 'high' due to cannabis. The 'high' was less pursued and valued by exclusively medicinal cannabis users compared to people who have recreational experience. An explanation for different drug experiences can be found in social learning theories of drug use. These theories suggest that using cannabis and interpreting the effects (as enjoyable) has to be learned (e.g. Becker, 1953). Medical users must learn to enjoy the sensation of being 'high' through (social) learning processes (Hallstone, 2002; Athey, et al., 2017). If we apply the sociological theory of Becker it is possible that unexperienced medicinal cannabis users will not experience cannabis' 'pleasurable' psychoactive effects because they never learned to experience them from other users (Becker, 1953; Becker, 1973). The knowledge that one has, or the lack of knowledge one has, regarding a drug, influences how its effects are interpreted and the overall experience one has when consuming the drug (Becker, 1953; 1973; Pedersen & Sandberg, 2013).

Among the interviewees, psychoactive effects were often considered as unpleasant side effects by self-identified medicinal cannabis users. However, this depended on the intensity of these effects and the context in which cannabis was used. Whilst effects such as 'the high', an altered state of consciousness, confusion and impaired ability to function were more often found uncomfortable, subtle, mentally relaxing and calming effects were found many times to be positive. Finally, the findings in this chapter clearly illustrate how the psychoactivity of cannabis was therapeutically beneficial for mental as well as physical health problems. In particular for pain, mental processes induced by cannabis seemed to enable users to alter the experience of pain.

## Chapter 3

### Cannabis use patterns

#### *Introduction*

Cannabis use patterns have an influence on the absorption of cannabis' active ingredients and consequently on the overall effects experienced by its users. When examining cannabis use patterns and self-reported effects, it is important to cover administration methods, frequency of use, dose, and the form and potency of the cannabis products consumed. For instance, one individual who smokes one gram of low potency herbal cannabis (e.g. THC 5%) five times a day, will likely report different experiences than a person who orally ingests a millilitre of highly concentrated cannabis oil (e.g. THC 25%) once a day. Currently, little is known about the use patterns of self-identified medicinal cannabis users living in Europe. Furthermore, qualitative research is lacking that explores the reasons why medicinal users utilise certain cannabis products and ingestion methods, and that provides an explanation for medicinal users' dose frequencies. This third results chapter aims to fill in this gap by improving our understanding of self-defined medicinal cannabis use patterns.

Sections in this chapter based on the survey findings cover participants' frequency of use (see 1.1), cannabis dose (see 1.2), forms of cannabis products and methods of ingestion (see 1.3). I present the most commonly administration methods used by self-identified medicinal cannabis users, and I discuss participants' motives for choosing these methods and their most frequently reported disadvantages.

The first section of the interview results discusses the main forms of cannabis products and ingestion methods used for medicinal purposes (see 2.1). This includes first of all the different types of cannabis strains. Previous research suggests that medicinal cannabis users choose specific strains to treat their conditions (Piper, 2018). I will focus on the two well-known categorisations of the cannabis plant rooted in the recreational cannabis culture, i.e. Sativa and Indica. This section then moves to discuss the most commonly used administration methods among the interviewees, which included smoking, vaporizing and the ingestion of herbal cannabis extracts. In the final subsection on cannabis products and administration methods, I explore self-reports on THC and CBD concentrations. Only a handful of studies have looked into the chemical constellation of cannabis products used by medicinal cannabis users (e.g. Hazekamp & Heerdink, 2013). My findings on this topic are solely based on interview data because of the complex nature of the data, which will become clear throughout this subsection.

The subsequent section based on the findings from the interviews discusses cannabis dosages and frequency of use (see 2.2). In its first subsection I focus on choices in cannabis use patterns in order for medicinal cannabis users to be able to function. The other subsection focuses on periods of abstinence.

Studies conducted in the past illustrate the poor quality of cannabis products available in unregulated markets (Hazekamp et al., 2005; Leung, 2011; McLaren et al., 2008). Since quality is in particular important for people with health problems, I look into the attitudes and experiences of medicinal cannabis users regarding the quality of cannabis products in the penultimate section of this chapter (see 2.3). The final section of this chapter focuses in on the fact that medicinal cannabis use is often equal to experimentation in an unregulated context (see 2.4).

## 1. Results of the survey

### 1.1 Frequency of use

Survey participants were asked how frequently they used cannabis during the past twelve months and when they used cannabis most often during the day. For both questions participants were able to select one answer from a predetermined list. The vast majority of the respondents were daily users (n=271; 72.7%). Four percent used cannabis less than once a week (n=15) and the remaining quarter used cannabis one to six times per week (n=87) (see **table 28**).

There was no significant difference between the three subpopulations (exclusively medicinal, previous recreational and current recreational users) regarding frequency of use (p=0.747) (see **table 28**).

**TABLE 28:** SURVEY PARTICIPANTS' FREQUENCY OF CANNABIS USE DURING THE PAST TWELVE MONTHS

	Total (n=373)*		Exclusive medical (n=78)		Previous recreational (n=94)		Current recreational (n=183)	
	N	%	N	%	N	%	N	%
Less than once a week	15	4.0	3	3.8	5	5.3	7	3.8
1 to 2 days per week	23	6.2	5	6.4	5	5.3	12	6.6
3 to 4 days per week	36	9.7	6	7.7	9	9.6	20	10.9
5 to 6 days per week	28	7.5	5	6.4	7	7.4	15	8.2
Daily	271	72.7	59	75.6	68	72.3	129	70.5

\* N=373, because three participants selected the option 'I prefer not to answer' and five participants selected the option 'I don't know'.

When looking at the time of the day, the largest group used cannabis most often in the evening (n=104; 28.3%), closely followed by participants who indicated using it at any moment during the day when necessary for symptom relief (n=88; 24.0 %) (see **table 29**).

**TABLE 29:** USUAL TIME OF SURVEY PARTICIPANTS' CANNABIS USE DURING THE DAY (N=367)\*

	N	%
Evening	104	28.3
Every moment during the day when necessary for symptom relief	88	24.0
Specific times during the day	66	18.0
Right before going to bed	49	13.4
From morning till evening	46	12.5
At night	7	1.9
Afternoon	4	1.1
Morning	3	0.8

\*N=367, because three participants selected the option 'I don't know' and 11 participants selected the option 'other'.

I asked participants if there were periods in which they did not use cannabis. If participants said they did, they were asked to select reasons for not using cannabis temporarily from a predefined list of possible reasons. Multiple answers could be cited. Seventy percent of the respondents (n=263) reported

having periods in which they were not using cannabis. The main reason for introducing intermissions was to check if one could live without cannabis and to see if people are dependent on cannabis (n=104; 45.4%). Other commonly reported reasons included the inability to find supply (n=73; 31.9%) and to afford cannabis (n=64; 27.9%). Many respondents (n=67) selected the option ‘other reason’ and a large subset of these respondents wrote down reasons related to travelling (n=17) (see **table 30**).

The current and previous recreational subgroups were more likely to have periods without using cannabis than the exclusively medical group (p<0.001) (see appendix 1, **table 30a**).

**TABLE 30: SURVEY PARTICIPANTS’ PERIODS WITHOUT USING CANNABIS**

<b>Periods without using cannabis (n=377)*</b>	<b>N</b>	<b>%</b>
Yes	263	69.8
No	114	30.2
<b>Reasons for not using cannabis temporarily (n=229) **</b>		
To check if I could live without it, to test if I was dependent on cannabis	104	45.4
Inability to find supply	73	31.9
Too expensive	64	27.9
Concerns about law enforcement	39	17.0
No longer needed for medicinal purposes	30	13.1
Concerns about dependence	29	12.7
Troubles with law enforcement	28	12.2
No specific reason	27	11.8
Others’ negative responses	15	6.6
Concerns about job security	13	5.7
Unpleasant adverse events	10	4.4
Ineffectiveness	7	3.1
Health deteriorated	4	1.7

\*N=377, because four participants selected the option ‘I prefer not to answer’.

\*\* This question was only shown to participants who indicated in a previous question that they had periods in which they did not use cannabis (n=263). 67 respondents filled in the option ‘other’. Totals exceed 100% because multiple responses could be selected.

## 1.2 Dose

The following questions assessed survey participants’ consumed dosages of cannabis. From a drop down list, participants were asked how many grams of cannabis they used per week. When they used cannabis solely as a liquid they were asked to answer ‘does not apply’. The next question had the same format, this time grams were replaced by millilitres. When participants did not use cannabis as a liquid they were asked to select ‘does not apply’ (see **table 31** and **32**).

While almost one in five (18.2%; n=69) used cannabis solely as a liquid, about half (53.5%; n=201) reported using cannabis not liquefied. One third of the survey participants who consumed cannabis as a liquid (n=62; 35.4%) were not aware how many millilitres they used per week. One tenth (n=35; 11.3%) could not tell how many grams they used in a week (see **table 31**).

**TABLE 31:** SURVEY PARTICIPANTS' AWARENESS OF CANNABIS DOSE

	Total		Exclusive medical		Previous recreational		Current recreational	
	N	%	N	%	N	%	N	%
<b>Grams</b>	<b>N=379*</b>		<b>N=80</b>		<b>N=96</b>		<b>N=184</b>	
Does not apply	69	18.2	41	51.2	19	19.8	7	3.8
Yes	310	81.8	39	48.8	77	80.2	177	96.2
<b>Awareness of amount (g) used per week</b>	<b>N=310</b>		<b>N=80</b>		<b>N=95</b>		<b>N=182</b>	
I don't know	35	11.3	10	25.6	9	11.7	15	8.5
I don't want to answer	4	1.3	3	7.7	0	0.0	1	0.6
Yes	271	87.4	26	66.7	68	88.3	161	90.9
<b>Millilitres</b>	<b>N=376**</b>		<b>N=80</b>		<b>N=95</b>		<b>N=182</b>	
Does not apply	201	53.5	25	31.3	48	50.5	117	64.3
Yes	175	46.5	55	68.7	47	49.5	65	35.7
<b>Awareness of amount (ml) used per week</b>	<b>N=175</b>		<b>N=80</b>		<b>N=95</b>		<b>N=182</b>	
I don't know	62	35.4	22	40.0	17	36.2	22	40.0
I don't want to answer	4	2.3	2	3.6	1	2.1	1	1.5
Yes	109	62.3	31	56.4	29	61.7	42	64.6

\* N=379, because two responses were missing.

\*\* N=376, because five responses were missing.

On average, respondents reported an amount of five grams of herbal cannabis (range: <0.5-25; median=5) and four millilitres of cannabis liquids (range: 0.3->50; median=2) used per week. 31.4% (n=85) use less than three grams per week, 36.1% (n=98) use between three and five grams, and 32.5% (n= 88) use more than five grams. I found no significant difference between the three subgroups with regards to the amount of grams of cannabis used per week (p=0.121). Exclusively medicinal cannabis users reported higher levels of millilitres used per week compared to previous recreational users (p=0.028) (see **table 32**).

It is important to note that the self-reported amounts of grams and millilitres have limited informational value, because the proportions of active ingredients in the participants' cannabis products are unknown.

**TABLE 32:** SURVEY PARTICIPANTS' CANNABIS WEEKLY DOSE

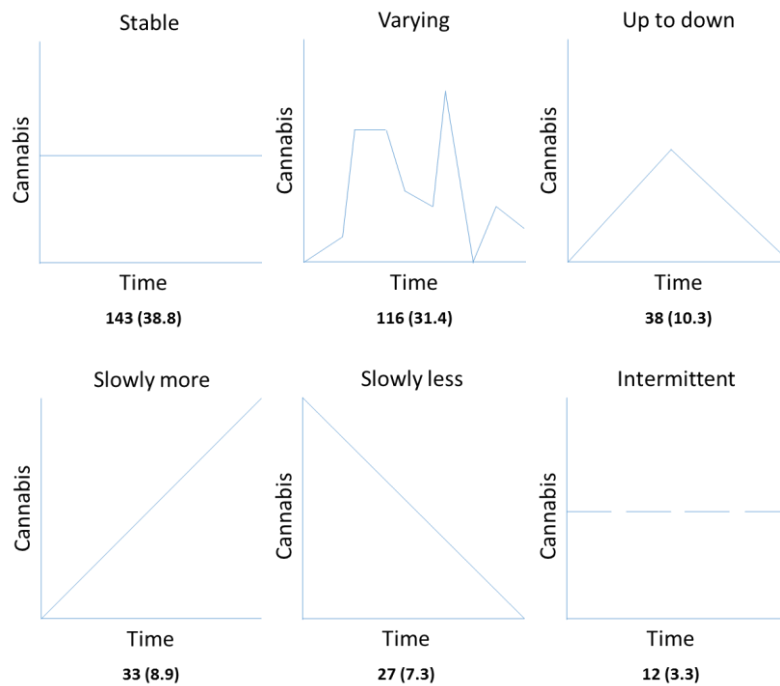
	Total	Exclusive medical	Previous recreational	Current recreational
Grams/week, mean (SD)	5.34 (4.93)	3.84 (4.02)	5.46 (5.49)	5.46 (4.85)
Median	5.0	2.5	4.5	5.0
Millilitres/week, mean (SD)	3.86 (8.42)	6.16 (10.95) <sup>a</sup>	1.91 (2.27) <sup>a</sup>	3.49 (8.99)
Median	2.0	3.0	1.0	1.0

By showing the participants graphs I asked them if the amounts of cannabis they used had changed since the start of their use. Participants had to select one graph, with a corresponding description, which they thought best described their cannabis use patterns with regards to dosage (see **figure 7**). Almost forty



percent indicated that the amount of cannabis had remained stable since the start of their use (n=143) and about thirty percent reported that it has been varying (n=116). About ten percent of the sample said that their use went first up and later decreased (n=38). Less common were people who reported that their use slowly increased or slowly decreased (n=27; 7.3%) and people who reported an intermittent use pattern (n=12; 3.3%) (see **figure 7**).

**FIGURE 7: THE AMOUNT OF CANNABIS USED BY SURVEY PARTICIPANTS SINCE THE START OF THEIR USE: N (%) (N= 369)\***



\*N=369, because nine participants selected the option ‘I don’t know’ and three participants selected the option ‘other’.

While exclusively medical cannabis users were more likely to report stable use patterns, the other subgroups reported more often that varying use (see **table 33**).

**TABLE 33: AMOUNTS OF CANNABIS USED SINCE START OF USE (COMPARISONS BETWEEN THE THREE SUBGROUPS)**

	Exclusive medical (n=74)		Previous recreational (n=94)		Current recreational (n=183)	
	N	%	N	%	N	%
Stable	43	58.1 <sup>a</sup>	35	37.2	59	32.2 <sup>a</sup>
Varying	8	10.8 <sup>a,b</sup>	27	28.7 <sup>a</sup>	75	41.0 <sup>b</sup>
Up to down	7	9.5	9	9.6	19	10.4
Slowly more	10	13.5	6	6.4	14	7.7
Slowly less	5	6.8	11	11.7	11	6.0
Intermittent	1	1.4	6	6.4	5	2.7

<sup>a,b</sup> groups with the same superscript differ significantly from each other at a significance level of p≤0.017, tested using Chi<sup>2</sup> test.

### 1.3 Cannabis products and administration methods

Using Likert scales ranging from ‘never’ to ‘always’ participants were asked how many times they used a particular cannabis product and ingestion method during the past twelve months (see **table 34** and **table 35**).

Dried cannabis flowers were by far the most used cannabis product in the past twelve months, followed by CBD oil and cannabis oil. While more than half of the sample (n=234; 61.4%) reported having used hash the past twelve months, only 7.6% (n=29) said that they used hash often or always. Over a quarter of the sample (n=110) had used cannabis in the form of ointment in the past twelve months. The cannabis product used least often was the legally-available cannabinoid pharmaceutical Sativex®. Only 4.7% had used Sativex® during the past twelve months (see **table 34**).

**TABLE 34:** CANNABIS PRODUCTS USED BY SURVEY PARTICIPANTS IN THE PAST TWELVE MONTHS (N=381)

	Never		Seldom-sometimes		Often- always	
	N	%	N	%	N	%
Dried female flowers/marijuana	56	14.7	51	13.4	274	71.9
CBD oil	157	41.2	119	31.2	105	27.6
Cannabis oil	185	48.6	116	30.4	80	21.0
Hash	147	38.6	205	53.8	29	7.6
Cannabis-infused ointment, balm or lotion	271	71.1	71	18.6	39	10.2
Raw cannabis juice	337	88.5	39	10.2	5	1.3
Sativex®	363	95.3	13	3.4	5	1.3

Multiple cannabis products were the norm, with 87.7% (n=334) having used more than one cannabis product during the past twelve months and 59% (n=225) at least three different cannabis products. The average number of cannabis products used by one participant in the past twelve months was three. Unsurprisingly, I found corresponding results for modes of consumption. 88.4% (n= 337) used more than one administration method during the past twelve months. The average number of administration methods was four per participant.

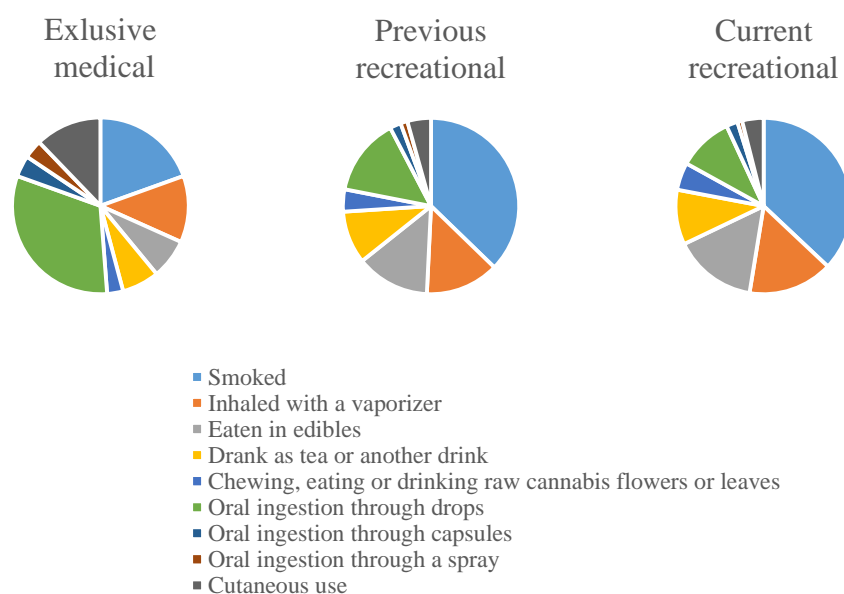
Ingestion methods reported most often, included smoking joints, oral ingestion through drops and inhalation with a vaporizer. By adding up the different types of inhalation methods, I found that 85 % of the sample have inhaled cannabis in the past twelve months. While over half of the sample indicated having consumed cannabis edibles in the past twelve months (58.8%), only six percent consumed edibles often or always. Less than half of the sample drank cannabis-infused beverages, used cannabis cutaneous and smoked cannabis with a hookah or a blunt. Finally, less than twenty percent consumed raw cannabis and orally ingested cannabis extracts with capsules or a spray (see **table 35**).

**TABLE 35:** ADMINISTRATION METHODS USED BY SURVEY PARTICIPANTS IN THE PAST TWELVE MONTHS (N=381)

	Never		Seldom-sometimes		Often- always	
	N	%	N	%	N	%
Smoked with a joint	87	22.8	60	15.7	234	61.4
Oral ingestion through drops	157	41.2	105	27.6	119	31.2
Inhaled with a vaporizer	149	39.1	149	39.1	83	21.8
Eaten in edibles	158	41.5	200	52.5	23	6.0
Smoked with a hookah	219	57.5	143	37.5	19	5.0
Drank as tea or another drink	228	59.8	136	35.7	17	4.5
Cutaneous use	301	79.0	43	11.3	37	9.7
Smoked with a blunt	274	71.9	98	25.7	9	2.4
Chewing, eating or drinking raw cannabis flowers or leaves	309	81.1	65	17.1	7	1.8
Oral ingestion through capsules	341	89.5	27	7.1	13	3.4
Oral ingestion through a spray	359	94.2	15	3.9	7	1.8

I found significant differences between the three subgroups regarding consumed cannabis products and administration methods used. Nearly all in the current recreational group (n=180; 97.8%), and ninety percent of the previous recreational users (n=86), have consumed dried cannabis flowers in the past twelve months, while this holds for only half of the exclusively medical group (n=40; 49.4%). Current recreational users are more likely to have used hash (83.7%), compared to previous recreational users (58.3%) and exclusively medical users (13.6%) (see appendix 1, **table 34a**). Exclusively medicinal cannabis users were less likely to inhale cannabis (smoking and vaporizing) and to drink it, compared to both other subgroups. They are more likely to ingest cannabis liquids orally through drops (see **figure 8** and appendix 1, **table 35a**).

Current recreational cannabis users reported the greatest number of different cannabis products ( $\bar{x}$ =3.42) and administration methods ( $\bar{x}$ =4.96) per person used during the past year, followed by previous recreational users ( $\bar{x}$ =2.91 resp.  $\bar{x}$ =4.08). Exclusively medicinal users reported the lowest number of different products ( $\bar{x}$ =2.25) and ingestion methods ( $\bar{x}$ =2.53) per respondent (see appendix 1, **table 35b**).

**FIGURE 8:** ADMINISTRATION METHODS USED BY SURVEY PARTICIPANTS IN THE PAST TWELVE MONTHS (COMPARISON BETWEEN THE THREE GROUPS)

Survey participants who inhaled<sup>29</sup> cannabis were asked if they added tobacco to their cannabis. The majority of people who inhaled cannabis mixed it often or always with tobacco (n=200; 61.7%); 14.8% (n=48) mixed cannabis seldom or sometimes with tobacco, and almost a quarter had never mixed the two substances (n=76) in the past twelve months (see **table 36**). Participants who inhaled their cannabis with vaporizers were also eligible to answer this question. When only including participants who smoke cannabis, the number of individuals mixing cannabis with tobacco would probably be higher.

Exclusively medicinal users who inhaled cannabis were less likely to mix cannabis with tobacco compared to current recreational users (p=0.002) (see appendix 1, **table 36a**). One explanation for this finding might be that they are less likely to smoke cannabis with joints and more likely to vaporise cannabis.

**TABLE 36:** CANNABIS MIXED WITH TOBACCO BY SURVEY PARTICIPANTS WHO INHALE CANNABIS (N=324)\*

	N	%
Never	76	23.5
Seldom- sometimes	48	14.8
Often- always	200	61.7

\*N=324, because the question 'how often cannabis was mixed with tobacco' was only posed to participants who indicated inhaling cannabis in a previous question.

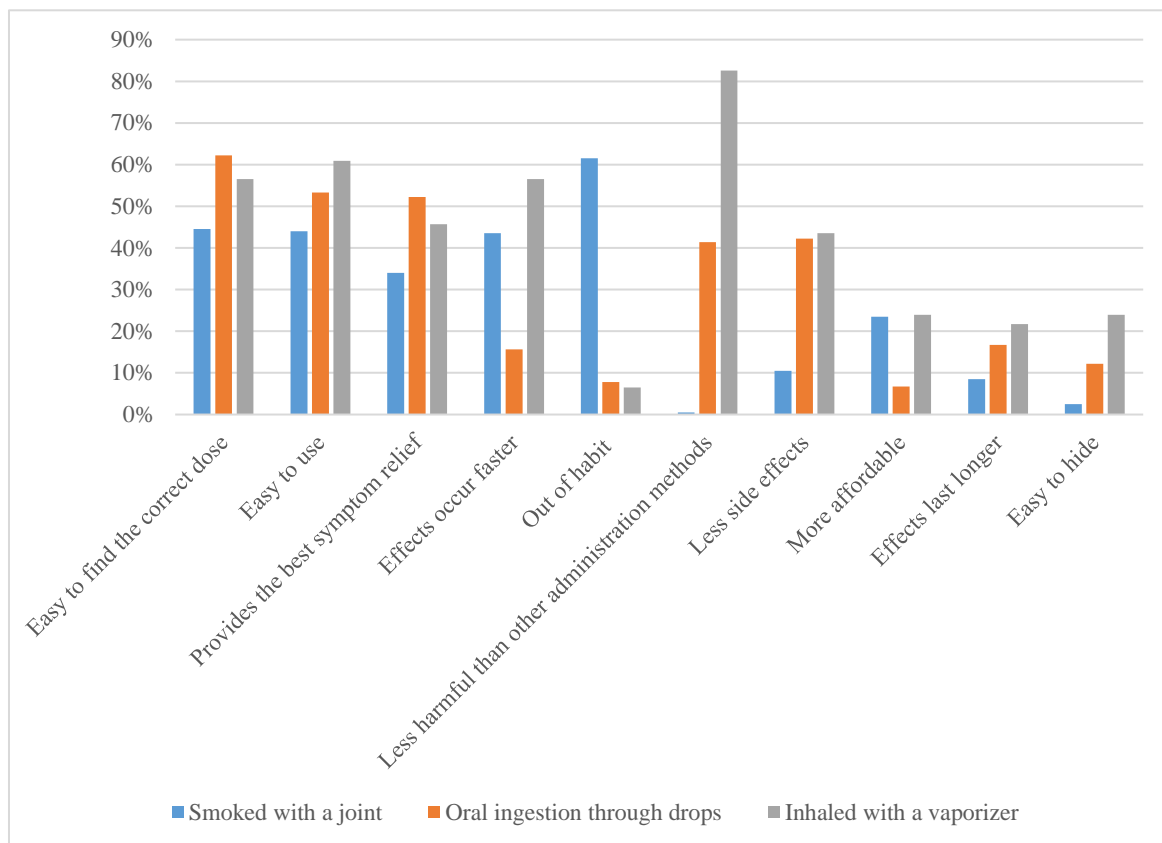
<sup>29</sup> This included participants who used one of the following inhalation methods in the past twelve months: 'Smoked with a joint', 'Inhaled with a vaporizer', 'Smoked with a hookah' and 'Smoked with a blunt'.

In a next question, participants were asked to select only one administration method which they have used most often in the past twelve months. For this method of ingestion they had to select motives why they chose to use this method, and its perceived disadvantages (see **figure 9** and **figure 10**).

The most used administration methods in the past twelve months were smoking cannabis with joints (n=200), oral ingestion through drops (n=90) and inhalation with a vaporizer (n=46). In the analysis the motives for using these popular administration methods were compared (see **figure 9**).<sup>30</sup> Based on these comparisons I will discuss the most remarkable results. 82.6% (n=38) of the participants who inhale cannabis through a vaporizer report using this method because it is less harmful than other administration methods; 41.4 % (n=37) of the people who orally ingest it selected this reason, as did 0.5% (n=1) of the participants who smoke cannabis. Almost half of the participants who smoke chose to do this because effects occur faster (n=87; 43.5%); this was 56.5 % (n=26) of people who vaporise cannabis and 15.6% (n=14) of people who orally ingest cannabis. While 61.5 % (n=123) of the participants who smoke cannabis do this out of habit, only 7.8% (n=7) of people who orally ingest cannabis and 6.5 % (n=3) of those who vaporise, indicate using these particular administration methods out of habit. Finally, 10.5% (n=21) of the respondents who smoke indicate they smoke cannabis because it causes less side effects compared to other ingestion methods. 42.2% (n=38) of people who orally ingest cannabis and 43.5% (n=20) of people who vaporise selected this reason for using these administration methods (see **figure 9**). All motivations for choosing a particular ingestion method are displayed in the figure below.

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<sup>30</sup> Other administration methods were not compared regarding motives of use and perceived disadvantages because the frequencies were too low.

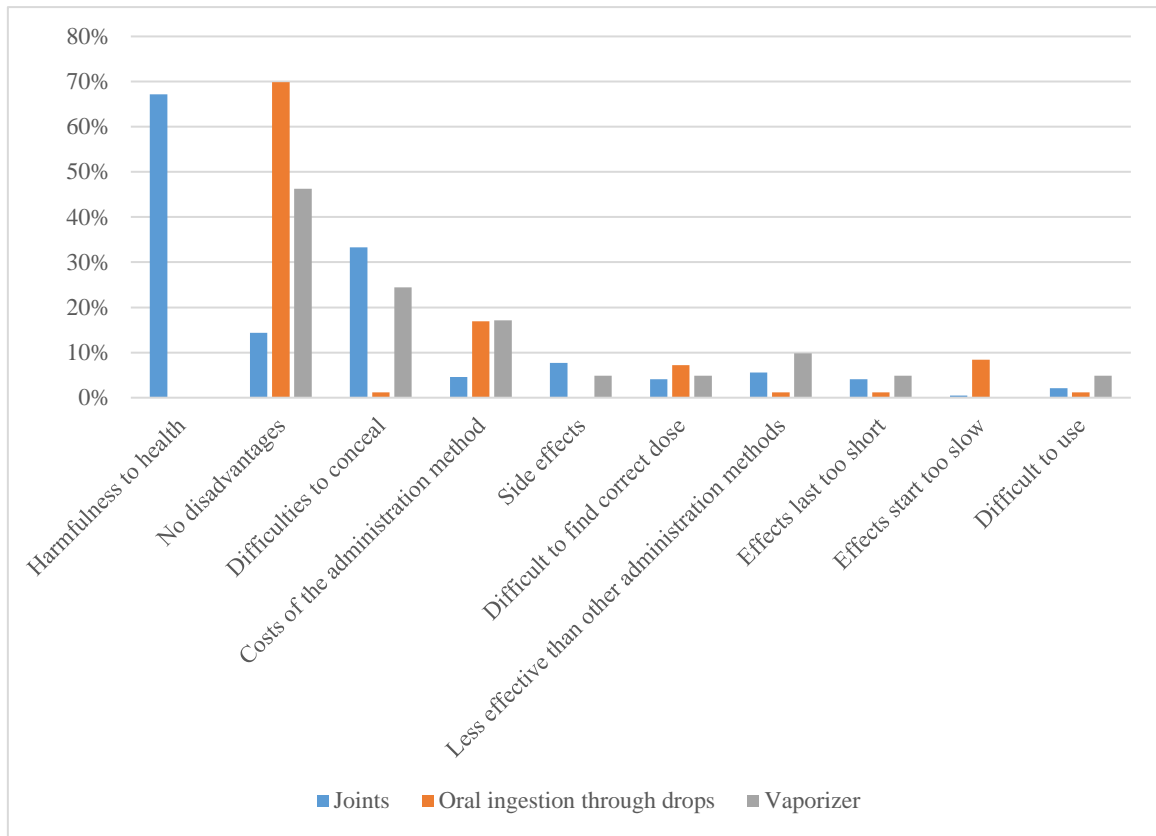
**FIGURE 9:** SURVEY PARTICIPANTS' MOTIVES FOR USING ADMINISTRATION METHODS

I compared the disadvantages of the most used administration methods of the past twelve months (see **figure 10**).<sup>31</sup> The most notable results will be discussed now. While two thirds of the participants who primarily smoke think harmfulness to health is a disadvantage of smoking (n=131), no one from the participants who vaporise or orally ingest cannabis selected this disadvantage. About one third of the participants who smoke (n=65), and a quarter of the individuals who vaporise (n=10), think that the difficulty in concealing their use is a disadvantage, but this is true for only 1.2% of people who orally ingest cannabis (n=1). Seventy percent of the participants who selected oral ingestion via drops as their most used method of ingestion thought that this administration method has no disadvantages. The same holds for only 46% of the people whose primary route of administration is vaporizing and 14.4% of the people whose primary administration method is smoking (see **figure 10**).

Disadvantages very seldom selected by the total sample were difficulties in using the administration methods and disadvantages related to the duration and the onset of effects. See **figure 10** below for all disadvantages per administration method.

<sup>31</sup> Ibid.

**FIGURE 10: PERCEIVED DISADVANTAGES OF MOST COMMONLY USED ADMINISTRATION METHODS**



## *2. Results from the face-to-face interviews*

### 2.1 Cannabis products and administration methods

Belgian medicinal cannabis users are not entirely free to choose their preferred cannabis products, because of limited accessibility and availability. When interviewees were asked which particular cannabis product they purchased, because it is most beneficial for their conditions, they often replied that it depended on the products that were available. In addition, most participants among my interview sample have utilised different types of cannabis products (e.g. cannabis oil and herbal cannabis) with various cannabinoid concentrations. Most interviewees did not stick to one cannabis product with a particular chemical composition, and this was for diverse reasons (e.g. preference to have a large variety of cannabinoids, experimenting with different chemical compositions for their effects, accessibility, etc.). Cannabis products used by the interviewees included: herbal cannabis; cannabis oil and paste; capsules (filled with crushed cannabis flowers or oil); hash; cannabis-infused beverages (e.g. tea and milk), ointments (including lip balm) and edibles (e.g. cookies); suppositories (filled with cannabis oil); raw juice; CBD tablets; terpenes spray; tinctures; etc.

Methods of drug delivery reported by the interviewees included inhalation, topical, rectal and oral routes of administration. The main consumption method used was smoking joints, closely followed by the oral ingestion of cannabis oil and vaporisation of dried cannabis flowers. Similar to the wide range of cannabis products offered online, some of my respondents used unusual cannabis products and ingestion methods, such as hot chocolate with cannabis ice cubes and dabbing.<sup>32</sup> The preference for certain ingestion methods was very personal as will become clear in this section.

Many participants in the interview sample (have) prepared cannabis derived products themselves (n=21). These included mainly extracts such as cannabis oil, but also cannabis-infused ointments, edibles and drinks. For instance, **Willy (70)**, prepared low-potency cannabis-infused milk with ginger, honey, butter and with herbal cannabis he cultivated himself. He froze the milk in separate doses of 20 ml for himself and his wife as a treatment for chronic pain. **Katrien (45)**, suffering from chronic back pain, made her own cannabis-infused butter for baked goods. She added the butter to the dough from which she made cookies. Also Katrien froze this low-potency butter so as to have cookies for a longer period. Katrien and Willy ingested the cannabis-infused products before going to bed on a daily basis.

Preparing cannabis products at home appeared to have some downsides. For instance, **Kim (31)**, suffering from a congenital progressive neuromuscular disease, stated that making cannabis cake was a lot of work for her due to her physical limitations. Kim, who was in a wheelchair, got daily assistance with other household chores. **Bernard (56)** stopped making cannabis butter because of the work. In addition, he decided not to make cannabis oil himself because the process of making cannabis oil was

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<sup>32</sup> “Dabbing is the inhalation of a concentrated tetrahydrocannabinol (THC) product created through butane extraction.” (see Stogner & Miller, 2015, p.1).



too dangerous (i.e. risk of fire and explosion). **Rudy (55)** wanted to make cannabis wax himself but also thought it was too risky because of the butane gas or alcohol necessary for the preparation.

### 2.1.1 Herbal cannabis strains

All of the interviewees consumed herbal (derived) cannabis products (n=62). The majority used cannabis in the form of dried female flowers and leaves (marijuana) (n=47). During the interviews many names of specific cannabis strains came up when respondents spoke about the effects of particular strains e.g. White widow, OG Kush, White Russian, etc. According to my participants, certain strains were better suited for particular conditions and respondents ascribed different (therapeutic) effects to the strains (Piper, 2018). For example, ‘White widow’ was pain relieving according to one respondent, and another respondent thought ‘Twilight’ helped against depressive symptoms. Multiple respondents tried different strains to find out which were most effective according to their preference.

A significant number of interviewees used a specific cannabis strain that they considered beneficial for a particular condition or symptom, and other varieties for other health problems. **Louise (29)**, living with multiple conditions, mentioned that she needed a different plant for each of her medical conditions (e.g. depression, arthritis, bowel disorder, psoriasis, etc.). She experienced that a particular strain was very beneficial for stomach problems but not for psychological problems. **Jolien (25)** living with MS, explained that she had to switch between cannabis strains with different chemical compositions for cannabis to remain effective for multiple symptoms (e.g. pain and spasms). Other interviewees did not notice any significant difference between the (therapeutic) effects of different cannabis strains. Finally, another subpopulation experienced differences (e.g. taste), however all strain varieties were perceived therapeutically effective for their medical conditions.

#### 2.1.1.1 Indica versus Sativa

Cannabis Sativa and Indica are two well-known classifications of cannabis strains within the recreational cannabis culture. The plants are known by their different shapes, smell and alleged effects<sup>33</sup> (see McPartland, 2017; Hazekamp & Fishedick, 2012). Many self-identified medicinal cannabis users made a distinction between cannabis *Sativa* and *Indica* based on the effects the cannabis strains induce (n=20).

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<sup>33</sup> The cannabis Indica plant is smaller in height with broader leaves, while Sativa plants are taller, having long and narrow leaves. Hazekamp & Fishedick (2012, p. 660) summarised the purported effects of two types of cannabis as follows: “*The Sativa high is often characterized as uplifting and energetic. The effects are mostly cerebral (head-high), also described as spacey or hallucinogenic. This type gives a feeling of optimism and wellbeing, as well as providing a good measure of pain relief for certain symptoms. [...] In contrast, the Indica high is most often described as a pleasant body buzz (body-high). Indicas are primarily enjoyed for relaxation, stress relief, and for an overall sense of calm and serenity. Indicas are supposedly effective for overall body pain relief, and often used in the treatment of insomnia; they are the late-evening choice of many smokers as an aid for uninterrupted sleep.*”

My interviewees claimed that the Sativa strains act mainly upon the brain, by causing a high, producing energy, enhancing creativity, working up-lifting, influencing thoughts, making someone more open-minded, etc. Indica strains, on the other hand, would cause physical relaxation (body-high) and feelings associated with being ‘stoned’, including the well-known ‘couchlock’ effect.<sup>34</sup> Participants believed that Indica strains were beneficial for falling asleep, whereas Sativa kept them awake. For this reason, two respondents used particular cannabis strains in the evening to sleep and another type during the day to be active (Piper, 2018; Hazekamp & Fishedick, 2012).

A few respondents had a clear preference for cannabis Indica, Sativa or mixed strains. For example, **Bruno (55)**, a cancer patient, felt anxious when using Sativa and preferred Indica strains overall. Several respondents associated cannabis Indica with medicinal cannabis use and cannabis Sativa with recreational cannabis use.

### 2.1.2 Smoking

Smoking herbal cannabis strains with joints was the most common primary administration method among the interviewees. 39 of the 62 interviewees have at some point smoked cannabis with joints, and 35 of them were still smoking cannabis at the time of the interviews. Many respondents thought that smoking was a downside of using cannabis, because of the health hazards. As observed by **Bert**:

*“I’ve smoked [regular cigarettes] for a long time. When you haven’t smoked for two years it is sometimes against my will that I have to go outside to smoke in the evening. If I didn’t need it, I would quit immediately. It is as simple as that.” [Bert/M/39]*

For this reason, several respondents had switched from smoking to vaporizing cannabis, and others were thinking this over. Participants who never smoked cannabis claimed that if the only way to ingest cannabis was by smoking it, cannabis would have never been an option for them. Because of the lack of alternatives (e.g. expensiveness of vaporizers) and the advantages of smoking (e.g. easy to use, regulate, high efficacy and rapid onset), a subset of interviewees kept smoking although this was not everyone’s preference. More often, seasoned cannabis users preferred smoking cannabis also because of the taste, the effects of tobacco and/or the ritual.

#### 2.1.2.1 Tobacco

Most of the time cannabis and tobacco were combined into joints and smoked simultaneously. Respondents explained that smoking cannabis without tobacco was too expensive and/or the psychoactive effects were too intense. A few interviewees decided to smoke cannabis without tobacco

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<sup>34</sup> ‘Couchlock’= slang term for the sedative effect of cannabis which causes immobility and the desire to remain still and at rest.

(n=8). These interviewees believed that the effects of cannabis come into their own when it is smoked pure, and that it has a more pleasant taste. It was remarkable how many respondents claimed that the tobacco added to joints was responsible for the side-effects and health hazards of smoking cannabis.<sup>35</sup>

### 2.1.3 Vaporizing

The number of interviewees who vaporised cannabis was smaller compared to the number smoking. 25 respondents used a vaporizer at the time of the interviews and seven had tried it in the past. Interviewees' vaporizers ranged from small cheap e-cigarettes to more expensive high quality vaporizers. The majority vaporised herbal cannabis, whereas few used a vaporizer or an e-cigarette for cannabis liquids (e.g. THC oil) (n=5). Interviewees who preferred not to smoke cannabis found a solution in vaporizing cannabis. Overall, participants did not report difficulties caused by inhaling cannabis with a vaporizer.

### 2.1.4 Cannabis extracts

Cannabis extracts used by my interviewees included cannabis oil (including CBD oil), tinctures and ointments. 41 respondents were using cannabis extracts at the time of the interviews, mainly cannabis oils. Although the number of interviewees who used cannabis extracts was higher than the number of participants smoking herbal cannabis, cannabis extracts appeared to be less often a primary ingestion method. More often, cannabis extracts were used alongside other cannabis products.

Most cannabis oils were sticky and viscous liquid substances contained in small bottles. Four participants used cannabis paste, a thicker substance than most oils and tinctures. Cannabis oils were mainly orally ingested with a pipette, dropper, oral syringe or spoon. The oil was administered in the form of droplets under or on the tongue. Cannabis oils were less often mixed in drinks, or inhaled with a vaporizer. Other participants orally ingested capsules filled with oil, because these were easy to administer and to avoid the taste of the extracts. Many participants noted the bad taste of cannabis oils.

Like other administration methods, cannabis extracts were mostly used as a treatment for pain. Some medical indications were exclusively treated with cannabis extracts, including skin problems and cancer. Cannabis-infused ointments were mainly used for skin disorders, pain and inflammations (e.g. psoriasis). Cancer patients who self-medicated with cannabis, with the intention of fully curing their cancers, relied on highly concentrated cannabis oils. These oils contained high levels of THC and were also referred to as "*pure THC oil*" and "*Rick Simpson oil*."<sup>36</sup> The cannabinoid THC was considered essential to successfully cure cancer.

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<sup>35</sup> See PART IV Empirical results: Chapter 6 section 2.3.4 Comparison of risks

<sup>36</sup> *Rick Simpson oil* is named after a former patient living in Canada, who claims to have cured his skin cancer through topical application of highly concentrated cannabis oil, produced according to his own recipe. His story has spread on the internet and picked up by self-medicating patients (Romano & Hazekamp, 2013).

Multiple respondents (n=16) prepared their cannabis oils themselves with plant material or have tried making it in the past. **Thomas**, a father of two young children, described it as follows:

*“I make it at home and rinse it with pure alcohol. It is a complex process, a little bit ‘Breaking Bad’. With a baby food processor, baby bottle and a water pump, etc. It is quite fun actually.”* [laughs] [Thomas/M/35]

Participants noted that a downside of making cannabis oil out of herbal cannabis, was that much more plant material was needed than when inhaling the dried flowers. However, according to the interviewees, cannabis oil had multiple other advantages over other ingestion modes as it was easy to use, to administer, to titrate, to prepare, it did not have to be smoked and the odours remained limited. Therefore, using oil was also easier to conceal. A number of participants noted that using cannabis oil before going to bed or during the night was easier than inhaling cannabis.

Multiple interviewees believed that cannabis oil was a reliable cannabis product because it was easy to dose and it can be measured exactly. However, other respondents mentioned that it was difficult to ingest the exact number of drops of oil and that it may have happened from time to time that they took one or two drops more than usual accidentally. For this reason, one respondent switched from a pipette to a dropper. In the case of **Hendrik (78)**, his wife decided to administer him drops of cannabis oil with a spoon herself instead of him doing it with a little mirror, because of the risk of using too high a dose.

### 2.1.5 Medicinal cannabis use: a complex treatment

Most self-identified medicinal cannabis users tried out multiple methods of ingestion for the consumption of cannabis for diverse reasons.

Firstly, multiple interviewees preferred to use ingestion methods which were perceived as healthy or healthier than the method of ingestion they were using previously. Smoking cannabis was considered in particular to be unhealthy and therefore some users switched to alternatives such as a vaporizer, cannabis oil or cannabis tea.

Secondly, a common thread through all the interviews was ‘experimenting with cannabis’. Individuals tried multiple methods of ingestion, first and foremost to test if these were more effective than others, or to test if they were cheaper, easier to use or more convenient to dose and titrate. Similar to the differences in effects generated by cannabis products with different cannabinoid concentrations, respondents experienced distinct effects from different types of ingestion methods. For instance, **Roland (47)** experienced psychoactive effects due to vaporizing herbal cannabis and not when orally ingesting cannabis oil. Therefore, he decided to quit vaporizing. Other participants also tried certain methods of ingestion because they induced less (intense) psychoactive effects. As observed by **Lode**, suffering from MS and who had a large surplus of home-grown cannabis at a given moment:

*“Most of the cannabis that I cultivated and did not vaporise, I drank. Because I’ve read once that when cannabis juicing that you might have the benefits without getting high. So I tried it, but I didn’t notice really anything.” [Lode/M/39]*

Not all methods of ingestion appeared to be equally effective. For instance, **Nicole (45)** first tried to inhale cannabis through joints and a vaporizer to alleviate her pain, however both methods turned out to be ineffective in contrast to the cannabis oil that she used at the time of the interviews. In contrast, **Danny (55)**, who made cannabis oil himself, thought it was ineffective. Instead, he smoked joints to relieve pain. Two other respondents also thought that cannabis oil and vaporizing cannabis were less efficacious than smoking joints. Cannabis tea was considered more often less or therapeutically ineffective.

Thirdly, methods of ingestion were also chosen based on the duration or onset of the effects they induced. Certain participants preferred inhalation methods as they caused instant relief of pain. Other participants preferred oral ingestion methods (cannabis oil or edibles) because they remained effective for a longer period. For example, **Tom (37)** ate edibles once in a while alongside smoking and vaporizing cannabis, because it had a longer-lasting impact on his chronic pain. **Katrien (45)**, suffering from chronic pain as well, consumed cannabis in the form of cookies once a day to have longer-lasting therapeutic effects. When she drank cannabis tea she had to drink it all day, since the effects wear off more quickly. The longer duration of particular cannabis products was in particular convenient for sleeping problems (due to pain). **Kim (31)**, suffering from a progressive neuromuscular disorder, noted that when she smoked cannabis before going to bed it happened that she had to smoke at night because she woke up due to pain, while this was not necessary when eating baked goods. **Leo (54)** used a vaporizer right before going to bed to fall asleep quickly and used cannabis oil to sleep better during the night because the analgesic effects of the oil lasted longer.

At the time of the interviews, many respondents were using multiple administration methods and cannabis products simultaneously, for different reasons (n=41). Participants developed their own personal patterns of use to be able to cope with their health problems in different contexts. The following cases illustrate the complexity of medicinal cannabis use patterns.

At the time of the interviews, **Patrick (54)** had already been smoking joints for many years to cope with the symptoms of schizophrenia. More recently, he was diagnosed with lung cancer. Based on what he read online he decided to use CBD oil orally in the hope it would cure his cancer. **Helena (60)**, suffering from cancer as well, used a vaporizer and cannabis oil with the intention of fully curing the disease. The only reason why she started vaporizing cannabis, was because of the metastasis in her lungs. By inhaling cannabis Helena hoped the cannabinoids would go directly to her lungs. **Tom (37)** smoked cannabis right before he went to sleep, and vaporised during the day because the mental effects of vaporizing were less intense than those of smoking. **Heidi (48)** orally ingested CBD oil in the morning and in the evening, but when she was in pain during the day she used an e-cigarette to inhale the same oil. When

Heidi had to go somewhere she took CBD tablets to chew with her, because it was practical and discrete to use in public.

The following quote from **Jolien (25)**, suffering from MS, is a detailed description of the subjective drug effects produced by different administration methods:

*“Smoking helps immediately against spasms and pain. If I take CBD oil it works in the long run and it strengthens the immune system, making me less tired and more attentive. THC oil is also good for pain in the long term, but if I skip it for one day, the pain in my legs is killing me. The spasms become too intense. Furthermore, I have many spasms in my diaphragm for which I take CBD oil and they’re every time gone within a minute.”*  
[Jolien/F/25]

From the interviews it was clear that the preference for certain methods of administration was very personal. Several participants preferred certain modes of consumption because they were practical to use. For example, large vaporizers were not portable and expensive. **Kim (31)**, suffering from a progressive neuromuscular disorder, and **Maarten (37)**, who was paralyzed from his shoulders down, were not able to roll their own joints because of their physical disabilities and needed help from others. Some participants thought that a vaporizer was easier to use than smoking joints while others thought the opposite. For instance, **Maarten**, thought that vaporizers were impractical:

*“I tried a vaporizer but it was not my thing, because you have to be able to push the button. And I couldn’t. For me it was inconvenient to use. It was an e-cigarette. Such a vape thing with a mouth piece. I have tried it with THC oil and that was pretty okay, I liked that. However, the problem was that I couldn’t hold it. I really had to press it against my body to push the button with my hand. I didn’t want to do it that way every time again. So, I stuck to smoking, for now. It isn’t that healthy, but...”* [Maarten/M/37]

Other participants also reported practical downsides of vaporizers, as illustrated by the following quote:

*“I vaporise, and this is a lot of work. I have to put the machine on, I have to put the cannabis in the cup. The balloon has to fill, that takes half an hour... A joint is rolled right away, so when I’m in pain, it’s logical that I smoke.”* [Jolien/F/25]

**Thomas (35)**, who suffered from chronic back pain, thought that vaporizing cannabis was not ideal because he did not want to vaporise inside his house and this caused inconveniences, especially during winter. **Rudy (55)** in turn thought that vaporizers were easy to use. However, the capacity of his vaporizer was too small and the battery ran out too quickly. A few interviewees noted that using a vaporizer was more convenient and less visible in public spaces than smoking cannabis. Some methods of ingestion were preferred because they were easier to conceal in public, e.g. cannabis oil or edibles.

Administration methods were also chosen based on the easiness of dosing and titrating. Multiple participants thought that cannabis oil was easier to dose than other cannabis products. Several interviewees stated that edibles and drinks were not convenient because of the difficulty of dosing.

Finally, since most cannabis treatments were expensive, some participants appeared to be inventive to avoid wasting herbal cannabis, by reusing it with other administration methods:

*“There are a lot of particles in the vaporizer and after a while they stick to the sides. The resin sticks to the inside. When I clean it, I cook it out in boiling milk to degrease it. Then I drink the milk. It’s tasty and has a relaxing effect. Nothing is lost.” [Anny/F/58]*

*“I don’t have to buy good weed to vaporise. I use waste. Then the waste becomes also waste so to speak, which I use again to make weed butter or space cake. I also use the waste of my vaporizer as a base for my joints and add other weed to it. It is the same as if you would add tobacco. This way I have a pure joint for almost no money.” [Paul/M/59]*

### 2.1.6 THC versus CBD, mind versus body

In order to explain the effects produced by cannabis, most interviewees referred to its most familiar cannabinoids: tetrahydrocannabinol (THC) and cannabidiol (CBD). Only four of the 62 participants were not aware of the names and functions of these cannabinoids.

Most respondents distinguished between the effects produced by the two cannabinoids. Interviewees were aware of the fact that THC is a psychoactive component and CBD is a non-psychoactive cannabinoid. More often, participants expressed it as follows: *“you do not get high on CBD”*. Multiple respondents argued that CBD counteracts the psychoactive effects induced by THC and therefore CBD was believed to be protective against psychoses when consuming cannabis products. While THC was considered to work on the human brain, CBD was considered to act upon the body. Participants stated that THC enhances energy but that is also beneficial for sleeping problems. CBD was believed to be (more) important for medical use, because it caused varying therapeutic effects according to the interviewees, including muscle relaxation, anxiolytic effects, analgesic effects, tranquilizing effects, etc. For many respondents THC stood for recreational cannabis use and risks, while CBD was equal to medicinal use and safety.

The preference for the proportions of CBD and THC differed between the self-described medicinal users. The majority were opposed to very high THC levels and preferred strains with modest to low THC levels, whilst containing sufficient CBD. This way, cannabis would induce no or only mild psychoactive effects and still be therapeutically effective. However, most interviewees did not specify these low and high amounts. Many respondents had tried cannabis products with significant CBD levels to test if they were as therapeutically efficacious as generally claimed. Due to the psychoactive properties of THC, some of the novice medicinal cannabis users started with consuming cannabis products containing solely CBD. Only at a later stage did they feel comfortable trying cannabis products which also contained the psychoactive cannabinoid.

On the other hand, several respondents argued that high(er) THC levels were essential for cannabis to be therapeutically effective for certain conditions. Twelve respondents mentioned that these higher levels were necessary for sleeping problems. Four cancer patients emphasised the importance of very high THC levels for cannabis to be fully curative for cancer. Other conditions for which higher THC levels were presumed to be necessary were (severe) (acute) pain, depression and stress. **Ashley (21)**, a student suffering from chronic back pain caused by scoliosis, used a grinder to filter THC out of herbal cannabis which she saved for crisis moments. When she was in a lot of pain, she added the pure THC to a joint that she normally smoked, in order to increase its effectiveness.

Three respondents were opposed to what they called the “*artificial separation between THC and CBD.*” They believed it was a missed opportunity that nowadays it appeared that THC had to be avoided because of its psychoactive properties, while CBD was considered safe since it produces “*physical*” and “*herbal*” effects. They argued that CBD was a medical hype because it was legalised in several countries, and therefore commercial companies were picking up on this trend, only because of economic interests. These three participants emphasised the importance of THC for certain health problems.

Many interviewees who tried treating their health problems with cannabis products containing solely CBD and negligible levels of THC, thought that these were therapeutically ineffective or less effective (n=13). For instance, **Hendrik (78)** noticed that only cannabis oil with higher THC percentages was efficacious in relieving the symptoms of COPD. Low-potency cannabis oils turned out to be ineffective. It was clear that for these participants the cannabis products had to contain at least some THC. Several respondents referred to the importance of the interaction and synergy between CBD and THC. This phenomenon is also known as the entourage-effect and has been studied previously (Russo, 2011).

Only a few thought that using solely CBD products, and no other cannabis products, was sufficient. Three interviewees reported currently using exclusively CBD products with negligible THC percentages. They preferred not to use cannabis that contained THC, because of its psychoactive properties that could cause psychological effects.

Several participants consumed high concentration CBD products in addition to other cannabis products which did contain THC. For instance, **Tom (37)** used cannabis products with THC to cope with chronic pain. In addition, he needed CBD products to focus because of his PTSD. A couple of respondents had CBD products at their disposal to neutralise the psychoactive effects of THC when necessary. One of them was **Helena (60)** who had used extremely high dosages of THC in the past in the hope it would cure her thymic cancer. Back then she used CBD to counterbalance the psychoactivity of THC when needed. **Armand (50)**, suffering from comorbid mental health problems, stated he used CBD oil to compensate for the CBD that was missing in cannabis he bought from street markets. Two other respondents also took pure CBD products as a supplement. Finally, **Jolien (25)** who suffered from MS, said she used CBD to strengthen her immune system and because it helped against fatigue, in addition to other cannabis products used as a treatment for the symptoms of MS.



Overall, interviewees used cannabis products with varying cannabinoid content adapted to their medical conditions. For instance **Mary (58)**, who was still dealing with severe physical health problems due to a car accident in the past, used cannabis oil with a higher percentage of CBD for chronic pain and used cannabis oil with higher percentages of THC to cope with her depression. **Kim (31)**, suffering from a progressive muscle disorder, used a plant with a considerable amount of CBD for muscle relaxation and a plant with high THC levels for sleeping problems.

A significant number of respondents spoke about the (exact) percentages of THC and CBD of their cannabis products. These were many times presented on the labels of their cannabis products or they retrieved this information elsewhere (e.g. webstores). Other respondents were not aware of these concentrations. **Willy (70)** admitted that he was not aware of the THC levels of his home-made cannabis-infused milk. He believed that the percentages on the labels of most cannabis products currently sold by unregulated sources were meaningless, because they were inaccurate. Since interviewees experimented with cannabis products with different chemical compositions, used multiple types of cannabis products simultaneously (for instance several participants used cannabis oils with different cannabinoid concentrations simultaneously), and because interviewees were more often not aware of the chemical proportions of their own cannabis products, it was impossible to make an estimation of the range and total averages of THC and CBD percentages in the cannabis products used by my interviewees.

## 2.2 Dose and frequency of use

Frequency of cannabis use varied between my interviewees. Most self-identified medicinal cannabis users were daily users (n=45), the remaining interviewees used multiple times a week or per month. Their use frequency ranged from using it uninterrupted from morning till evening, or as one man said: “*using it from bed to bed*”, to using it once a day. Many interviewees used cannabis in the evening or right before they went to bed, mostly to have a good night’s sleep. Those who used cannabis less than daily used cannabis only when needed for symptom relief.

The doses of the cannabis products used by the interviewees varied widely, and multiple participants were not able to tell their exact doses. In addition, many participants used dried cannabis flowers, which are measured in grams, at the same time they also consumed cannabis liquids, which are measured in millilitres. In the case of herbal cannabis flowers, some respondents used an amount of less than 1 to 3 grams a week, while others used about 1 gram per day. Less common were participants who used 2 grams or more a day. Overall, medicinal cannabis users consumed a controlled dosage when using cannabis for medicinal purposes. Nobody noted using excessive amounts.

Interviewees’ dose depended on the chemical composition of the cannabis product (levels of THC and CBD). For instance, when using highly potency cannabis oil, one drop of oil per intake was enough compared to three drops when the oil was less strong. Most respondents set their dosage based on their own experiences regarding efficacy and side effects. For instance, two respondents used to take very

high dosages of cannabis oil, hoping to cure their cancer (e.g. 20 drops of cannabis oil per day). However, since their cancers were stabilised they took a much lower maintenance dosage.

Several interviewees had a fixed dose and frequency of use in normal circumstances, similar to taking prescription drugs. For instance, some of the participants who ingested cannabis oil orally, titrated an exact number of drops at specific times during the day. **Hendrik (78)** used a fixed dose of ten drops of cannabis oil four times a day to cope with symptoms caused by COPD. Next, multiple respondents mentioned that their dose and frequency of use also depended on the severity of their symptoms. This means consuming a higher dose, more frequently or earlier in the day when symptoms were worse than usual. Other interviewees' frequency of use and dose varied (greatly). This was mostly the case when cannabis was administered through smoking.

Novice medicinal cannabis users were often cautious in the beginning of their use. They started with a low dosage and dose frequency, and increased it slowly to find the most beneficial treatment. A number of interviewees claimed that they used very small doses of cannabis. For instance, three respondents noted that they only added a small amount of cannabis to their cigarettes compared to other cannabis users. **Katrien (45)** consumed 20 to 25 gram of herbal cannabis per year for pain relief, while other interviewees used this amount per month. For some, these small doses were enough to be therapeutically effective. However, other participants decided to use low doses because they wanted to avoid side effects occurring (e.g. psychoactive effects). **Lode (39)**, a MS patient who had bladder problems, experienced little therapeutic efficacy from cannabis. He was afraid of using a higher dosage of cannabis because of the risk of uncomfortable psychoactive effects. As a consequence he stopped using cannabis as a treatment. He commented that he might have never used enough cannabis to experience sufficient therapeutic effects. Three other interviewees also thought that their cannabis dose was probably too low to be fully beneficial. Similar to Lode, they were afraid of using too high a dose. This illustrates the importance of the need to balance the benefits and side effects of cannabis to patients, which is similar to the use of other medication. It is possible that also other users might have under dosed because they were anxious of using too much cannabis. Bakalar & Grinspoon (1997) argue that for this reason it is likely that medicinal cannabis users are under medicated.

### 2.2.1 "I need to function"

When respondents had to decide on the appropriate chemical composition, dose and frequency of use for cannabis to be therapeutically effective it was balanced against the psychoactive effects of cannabis which impaired their functionality and which interfered with their daily routine, outdoor and social activities. Respondents mentioned that their dose was as much as they needed to experience the positive effects of cannabis without being too 'stoned', 'high' or 'light-headed'. Interviewees explained that they needed a clear mind in order to be able to function and to be productive.

In several cases, the type of cannabis product and ingestion method used by the interviewees depended on the time of the day. Several self-identified medicinal cannabis users only used stronger cannabis products (higher THC levels) in the late afternoon, in the evening or right before they went to bed. These cannabis products were not used during the day, because respondents “*needed to be able to function*”. Otherwise, because of cannabis’ side effects, it would be more difficult to perform instrumental activities of daily life, and this would negatively affect their quality of life. Interviewees argued that they would sleep all day, be distracted, too tired, unfocused, unmotivated to be productive, etc.

Stronger cannabis products were needed in the evening or at night to combat certain symptoms but not necessarily during the day (e.g. sleeping problems (due to pain)). Respondents relied on less potent products during the day. A number of respondents mentioned not wanting to use cannabis the entire day, and therefore they decided not to use any cannabis product before a specific time (e.g. noon). **David (39)** had to eat six times a day due to severe digestive problems. Normally, it would be beneficial to smoke cannabis before as well as after all his meals. However, he preferred not to be surrounded by smoke all day, and therefore he never smoked in the morning.

Multiple interviewees never used any cannabis product when they still had to go to work or when chores had to be done (e.g. preparing dinner). Regardless of the composition of the cannabis product, they only used the substance when they were off. This was for similar reasons as those mentioned above, i.e. mental and physical side effects (e.g. lethargy). As a consequence, multiple respondents in this study only started using cannabis in the late afternoon, evening or just before they went to bed.

### 2.2.2 Periods without cannabis

Self-identified medicinal cannabis users took a break from using cannabis for various reasons (e.g. lack of money and access). For instance **Nick (24)**, decided recently to quit smoking cannabis for half a year. For three years he had been a daily user, because he needed cannabis for sleep problems due to work-related stress. At the time of the interviews, he wanted to focus more on working out and living healthy, and smoking cannabis did not fit in this healthy lifestyle. He considered smoking as well as using a psychoactive substance both as unhealthy behaviour. Since he started exercising intensively he felt tired every evening and he was able to fall asleep without using cannabis.

More often, interviewees quit with their cannabis use temporarily to test if they were addicted to or physically dependent on cannabis. Multiple participants wanted to know if they were still experiencing symptoms without cannabis. Some of them reported that during those periods of abstinence they noticed that they were not mentally addicted to cannabis but needed it for their physical health problems. Being addicted to cannabis was considered not the same as being dependent on cannabis for physical health problems. **Jeroen**, suffering chronic prostatitis, believed that needing cannabis every day for pain relief does not imply that one is mentally addicted to cannabis:

*“There are people who use cocaine or heroin, those people are dependent on their drugs, that is different. The cannabis user is medically dependent on his medicine to have no pain, not on the product itself.” [Jeroen/M/34]*

Interviewees declared that in periods when they did not use any cannabis product, they noticed that their health was deteriorating and that symptoms increased or returned. Some of the participants who benefited from the psychological effects of cannabis stated that others noticed when he or she had not used cannabis. Other respondents never tried to pause their cannabis use, because they were too afraid that health problems would return (e.g. pain). These examples illustrate that the efficacy of cannabis was based on personal experiences, on which I elaborated in the previous chapter.

Travelling abroad for a longer time was problematic for some interviewees because they thought it was too risky to bring cannabis with them. When participants were out of the country for a longer period (e.g. holiday abroad), they relied most of the time on conventional medications when necessary. **Sabine (51)** noted that she and her husband never went on holidays abroad because they both used cannabis and the risk of transporting cannabis was too high.

### 2.3 The quality of cannabis products

All interviewees paid attention to the quality of the cannabis products they consumed. For instance, by using biological fertilisers to cultivate cannabis or by only buying organically produced cannabis. However, for most sources of cannabis interviewees admitted quality control was lacking. Respondents were aware that the quality of the cannabis products bought from particular sources, such as dealers, friends, Dutch coffee shops and web stores, was unreliable and unpredictable, because of the risk of hazardous contaminants. Therefore, certain supply sources were avoided by a number of interviewees. On the contrary, other participants trusted the quality offered by their regular unregulated sources of supply (e.g. Dutch coffee shops and friends).

Multiple interviewees recounted experiences of buying poor quality cannabis products. Others had distrusted and were concerned about the quality of cannabis products they had bought, because they suspected they were contaminated. For instance, **David (39)** explained that one time the police detected MDMA in his blood while he had not used the drug. He believed that the MDMA must have been sprayed on immature cannabis plants together with water in Dutch coffee shops, to make them more active. **Anny (58)**, said she had bought cannabis strains in shifty shops in the Netherlands in the past. During this period she had bags of cannabis in which little blue balls were laying on the bottom. She noted, *“I thought, for god sake what am I smoking?”*.

The following respondent describes his negative experiences with low quality cannabis products as follows:

*“It happened that I threw the weed on the table and it was like marbles. Normally, marijuana flowers should be hard, but not as hard as marbles. Then I’m like, okay they have put hair spray or something on it.” [Rudy/M/55]*

## 2.4 Medicinal cannabis use: self-experimentation

During the interviews many respondents brought up the lack of information and instructions available in Belgium on how to use cannabis medicinally. For a lot of users using cannabis as a medicine was a trial-and-error experiment in their search for the right treatment. Multiple aspects of medicinal cannabis use were subject to self-experimentation, including the dose, frequency of use, method of ingestion, variety of cannabis strain, chemical constellation, cannabis product, homemade cannabis preparations, cultivating cannabis, etc. This experiment was not only true for people who had no experience with using cannabis, also seasoned recreational cannabis users had to learn how to use cannabis as a medicine (Becker, 1973).

Participants mostly relied on anecdotal evidence from other patients and information available on the internet to learn more about medicinal cannabis practices. In this context, respondents spoke of “*experimenting*”, “*searching*”, “*testing*”, “*figuring out*”, “*a trial*” and “*a quest*”. For instance, **Sophie (37)**, who never used cannabis in her life before trying as a treatment for the symptoms of fibromyalgia, spoke about “*a shot and a leap in the dark*”. She and other novice medicinal cannabis users described the learning process of using cannabis medicinally:

*“I tried it with the idea, it doesn’t hurt to try. But actually it turned out better than expected. It is really experimenting in the beginning. For instance you inhale five to ten times and you notice “nothing”. Then you add a scoop and again. Then you ask yourself “what does it do now? Do I need more grams or do I have to inhale more?” I could keep an eye on how much I used and I monitored what it did after a couple of hours, how much pain I had after using it. I really gave myself a score, such as “I woke up with a seven on a pain scale of ten. If I’ve used it now, how much does it lower?” It is really odd in the beginning when you take it and how you feel, because you wonder is this right or isn’t it? You are used to being rushed and to have pain and stitches. Then suddenly there is a part that goes away. It has been a serious quest.” [laughs] [Sophie/F/37]*

*“You have to figure out what you have to take to get rid of the pain. I also don’t want to run around like a junkie, then it’s wrong. I know that. But you have to figure it out yourself and I’m not a doctor. But you have to play doctor. I don’t have any medical supervision. You have to invent it yourself, when to take it, how much... I think that’s too bad.” [Magda/F/64]*

When interviewees tried cannabis for the first time or when adapting their use patterns, respondents asked themselves the questions “*How does this affect me? How do I feel?*”. Based on their own experiences they would adjust their treatment. For example, they searched for their maximum limit regarding the amounts of cannabis, and when they felt the dose was too high they would decrease it. At the end of this process of experimenting, respondents found most of the time a treatment that they were most comfortable with. Three of my participants even made a detailed scheme on paper with the

therapeutic effects they experienced and to score symptom relief corresponding to their cannabis use patterns, in order to find an adequate treatment.

For people new to cannabis this experiment was not all plain sailing and often considered unpleasant. Participants were not sure if they consumed cannabis correctly and it happened that they ‘overdosed’ with cannabis. For instance, by accident, **Hendrik (78)** ingested twice as much than his normal number of drops of cannabis oil with a spoon. As a result, he felt as if he was hallucinating. Two other respondents said they had ingested cannabis oil unknowingly by accident.

In the beginning, novice medicinal cannabis users mostly started with a low dose (or low THC levels) and then increased it to a balanced level. Many times, the frequency of use was not a constant feature from the beginning. For example, one respondent decided to start with one drop of cannabis oil three times a day, and at the time of the interview she was using three drops, two times a day. Other participants stated that their dose had decreased since the beginning. Comments by **Liesbeth**, a novice medicinal cannabis user suffering from neuropathic pain, illustrate that it can be a trial-and-error process when self-medicating:

*“I started at the beginning, on the advice of my son because I don't know much about it, with two drops in the morning and two drops in the evening. With the thought that I might also sleep well, because I'm a very bad sleeper. I only sleep 3-4 hours a night. But I found out that it didn't have the effect in the evening that I had in mind. I still had nerve pains regularly. They were less painful but their frequency remained. I then switched to three drops in the morning and I have a lot more effect from that. I still have to be careful, because I have other medication, so that I don't take those together.”* [Liesbeth/F/56]

In the section above on cannabis products and methods of ingestion I already discussed reasons for using multiple administration methods. Most of these reasons were related to efficacy, personal preference, side effects, health risks and practicability. Medicinal cannabis users tried multiple cannabis strains and cannabis products (e.g. CBD oil, strains with low or high CBD, strains with low or high THC, etc.) to find a suitable treatment based on their own experiences. Because participants used products with different compositions they had to adjust their dose correspondingly to the product. Finding the right dose could be a real search.

Because of the lack of information in Belgium and consequently the lack of individualised medical guidance available to Belgian medicinal cannabis users, most respondents were left to their own devices and were forced to experiment. For instance, **Caroline (39)** who suffered from chronic pain, felt uneasy to use cannabis without medical guidance and thus she used it rarely. Even if respondents had some kind of medical support or guidance, for example when their physicians prescribed cannabis, many times they still had to make decisions regarding their use patterns (e.g. dose frequency).<sup>37</sup>

Since most users had to figure out their cannabis treatment themselves, some of them were unsure whether cannabis was effective for particular health problems, and if changes in their health were

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<sup>37</sup> See PART IV Empirical results: Chapter 5 section 2.2.1 Medical supervision

attributable to cannabis. When participants noticed certain improvements regarding their conditions they could not always tell if cannabis was the cause. Participants expressed themselves tentatively: “*So I think that cannabis has something to do with it...*”, “*I can only tell what I see...*”, “*I suspect that there is a link with cannabis...*”, etc. One respondent noted that inflammations were the cause of his chronic pain and when he started using cannabis oil the pain stopped. He stated that for this reason he “*had the feeling that cannabis was anti-inflammatory*”. Next, **Anthony (50)** a MS patient, stopped his regular MS medication five years ago, and according to Anthony his health has not deteriorated since then. He thought this might be due to cannabis, however he did not rule out other causes, like his retirement. Anthony put it as follows:

*“From April first 2013 I’m officially retired. But since the last relapse of March 2012 I haven’t had any. Is this because I’m at home and can organise my life myself? And because of instead of being woken every morning at five by my alarm that rings, I can wake up now when my body is ready to be awake? Is it the cannabis? Is it the combination of the two? I don’t know, but for me it’s good.”* [Anthony/M/50]

When simultaneously taking treatments other than cannabis, it was difficult for some interviewees to determine what role cannabis had played in the improvement of their conditions. Other times, participants simply did not know which particular effects cannabis had on their health. Because of the lack of medical guidance, they could not tell if they felt improvements or not, and they were unsure how to interpret the (therapeutic) effects of cannabis. For instance, **Hendrik (78)**, living with COPD, did not have the impression that he was breathing better because of the cannabis oil, but he noted that he coughed less in general, and coughed up less phlegm:

*“If we would notice that I’m becoming very sick or if I’m not okay then I’ll quit. I don’t know until how many drops [of cannabis oil] I will take, maybe ten... Then I will stop if it really doesn’t do anything. Because in the end it is also not cheap. You have to pay the full price and you have to drive to get it. But I mean, you have to do it for longer than three or four months to know if there is any effect. That’s why I continue with using the oil. But you can’t keep searching for solutions, that’s impossible.”* [Hendrik/M/78]

Similar to Hendrik, other respondents were still trying to find out if cannabis was efficacious or not, and did not give up when they did not achieve the expected result immediately. They experimented with their cannabis use patterns.

When participants were suddenly confronted with particular ailments, discomforts or other health problems, they thought that these might be side effects caused by their cannabis use. Some participants tried to test if this was the case or not, as illustrated in the quote below:

*“I started to have concentration problems. First, I thought, would these be caused by cannabis? Then I didn’t smoke for particular periods to check if it had anything to do with it or not. I noticed that not a lot changed, so I visited a physician.”* [Jeroen/M/34]

### *3. Discussion*

In accordance with what is suggested in previous studies (Troutt & DiDonato, 2015; Walsh et al., 2013; Swift et al., 2005; Sznitman, 2017; Zaller et al., 2015; Lin et al., 2016), I found that most self-claimed medicinal cannabis users are daily users. When cannabis use patterns are similar to those of conventional medicines this result is what I expected. Daily or high frequency of cannabis use is associated with higher risk of cannabis abuse and dependence (Turner et al., 2014). However, Sznitman (2017) argues that more accurate screening tools are necessary to assess problematic cannabis use among medicinal cannabis users.

Medicinal cannabis users seem to discontinue their cannabis use for multiple reasons temporarily. People stop using cannabis temporarily to check for dependence. Next, they also appear to have periods without using cannabis because of access problems. A significant number of respondents reported not bringing cannabis with them when travelling. This issue cannot be solved by national regulations but requires an international approach.

Unsurprisingly, given the illegal status of cannabis in Belgium, most participants were using illicitly sourced cannabis products. Patients who obtain cannabis cultivated in unknown circumstances have legitimate concerns about their health, as studies conducted abroad show that contaminants have been found in illicitly sourced cannabis (Leung, 2011; McLaren et al., 2008). Most participants' cannabis products were obtained in Belgium and the Netherlands, and previous research findings suggest that cannabis produced and sold in these regions can be contaminated (Hazekamp et al., 2005; Hazekamp, 2006; Hazekamp, 2018; Vanhove et al., 2018). Contaminants have potential to cause serious health damage (Dryburgh et al., 2018), and medicinal cannabis users might be in particular vulnerable to these health risks.

In agreement with previous studies, most of my participants smoke cannabis with joints (Zaller et al., 2015; Walsh et al., 2013; Sznitman, 2017), and other commonly used cannabis products were cannabis oils, including CBD oils. Smoking is likely the most unhealthy delivery method, and therefore it is not recommended and not considered a medical ingestion method by policy makers and medical experts (MacCallum & Russo, 2018; Russell et al., 2018). Participants whose primary method of ingestion was smoking cannabis with joints thought that a disadvantage of smoking is that it is hazardous. An interesting question is why people continue to smoke cannabis when being aware of the risks it imposes. The interviews illustrated that people continued smoking, because of the lack of fully fledged alternatives, regarding costs and efficacy, but also because of the ritual and the taste. Survey participants indicated that they smoked cannabis out of habit. Other commonly reported reasons were the ease of finding the dose and because effects occur faster. These two reasons can also be achieved when vaporizing cannabis. The most reported reason for choosing to vaporise cannabis was that it is less harmful than other administration methods. This group of participants probably used a vaporizer as a healthier alternative to smoking.



In Europe, cannabis is often mixed with tobacco when smoked (EMCDDA, 2019). In this study, the majority of the participants who inhaled cannabis, consumed the substance by adding tobacco. The health risks related to tobacco use are well documented, and therefore smoking cannabis with tobacco poses additional risks to people who are already in poor health (MacCallum & Russo, 2018). Alongside the different experiences between smoking with and without tobacco, another reason why participants added tobacco to their cannabis products was related to affordability. Since cannabis was expensive in itself, smoking pure cannabis became too expensive.

The medicinal cannabis landscape is changing fast. The number of newly developed cannabis derivatives and administration methods continues to grow. There is an increasing trend of medical cannabis users turning to consumption methods healthier than smoking (Sznitman, 2017), including vaporisation and oral ingestion of cannabis extracts. Also edibles can be a safer alternative (Russell et al., 2018). Edibles were used by the majority of the survey participants, however not on a regular basis. Interviewees reported problems regarding dosing edible cannabis products and they were considered less practical in terms of preparing and consuming them.

Less than five percent of the survey participants report ever using Sativex®. This means that only a very small subsample were using a cannabis product legally available in Belgium. I expected this small number, since only patients suffering from multiple sclerosis are allowed to use Sativex® under strict conditions. In addition, the medicine was made available in hospital pharmacies only shortly before the launch of the survey (FAGG, 2017). This shows that using particular administration methods and cannabis products does not necessarily depend on preference only, but is also influenced by external factors such as the legal context and availability. For example people might prefer not to smoke cannabis, but have no other real options because of the lack of fully-fledged alternatives. Due to legal restrictions, medicinal cannabis users living in Belgium cannot access medically safe cannabis products and ingestion methods at the moment. Longitudinal data are necessary to document trends and changes in cannabis use patterns related to legislative changes.

The survey findings suggest that medicinal cannabis users who have a recreational history have different use patterns than medicinal users having no recreational history. Exclusively medicinal cannabis users were less likely to inhale cannabis and to consume cannabis-infused drinks and edibles than participants who have experience with recreational cannabis use. They were more likely to ingest cannabis liquids orally. This might suggest that exclusively medicinal users are more likely to use delivery methods which can be considered medical delivery methods. Only some of the vaporizers, which are also used less by this group, are also designed for medical use (e.g. Volcano©). It is possible that inhaling cannabis through a vaporizer is a smaller step for people who already have experience with smoking cannabis than people who have not. In this current legal climate, people who have used cannabis recreationally may stick to ingestion methods commonly used in the recreational culture.

This chapter shows that cannabis was used in different forms and through different administration methods by one individual. The fact that one individual uses multiple delivery methods aligns with previous research findings (Cranford et al., 2016). Participants relied on multiple products and delivery

methods because they caused distinct effects and because of practical reasons. In comparison with the beginning of their cannabis use, participants expanded their use patterns, by testing new ingestion methods and cannabis products for effectiveness when they were more experienced. The findings in this chapter illustrate that the type of cannabis product used depended on the time of the day and participants' activities. The largest subpopulation of survey participants used cannabis most often in the evening. This finding was echoed by my interviewees who preferred to use less potent or no cannabis products when they needed to be functional. Many times, cannabis was used by interviewees in the evening for sleep problems caused by chronic pain.

Self-identified medicinal cannabis users self-experimented with cannabis use patterns in order to find the right treatment. The present findings suggest that when patients have limited access to medical information they have to rely on other users' experiences, self-experimentation and self-observation. This means that they have to learn to identify the main therapeutic effects and side effects of cannabis themselves (Becker, 1973; Lankenau et al., 2018a), which is different from the use of other medicines. It is possible that medicinal cannabis users are not aware that particular experiences are caused by cannabis or might feel anxious when not knowing what they are experiencing or how to interpret these effects. If medicinal cannabis were to be legally available for a larger patient population, experimenting with cannabis products and modes of consumption would no longer be necessary, as there would be help available for people to find an efficacious treatment more easily. If medical expertise on medicinal cannabis expands, physicians can give clear instructions regarding dosage, dose frequency, cannabis products and administration methods.

Regarding survey participants' cannabis weekly dose, I found an average use of 5 grams of herbal cannabis per week which equates to 0.71 grams of herbal cannabis per day. This amount is similar or lower than amounts found in previous studies (Hazekamp & Heerdink, 2013; Hazekamp et al., 2013; Lucas et al., 2019; de Hoop et al., 2018; Zaller et al., 2015). However, the findings of the present study have limited informative value, because the chemical composition of participants' cannabis products is unknown. Only a few participants indicated that their cannabis dose had increased since the start of their use, which might be a protective finding for drug tolerance and dependence. This finding differs from interviewees' experiences with particular prescription drugs (e.g. opioids), for which they reported increased tolerance to their therapeutic effects (e.g. analgesic effects), and needing to increase the dosage.

What was remarkable was the high number of people who were not aware of the exact dose of cannabis they used per week. One in three of the survey participants who used cannabis as a liquid could not tell their weekly dose, whereas this was true for one in ten of the participants who used herbal cannabis. This unawareness is likely different from the use of other medications, as most people take standardised doses of conventional medicines. The interviews illustrated that more often participants were not aware of the chemical composition of their cannabis products, including the cannabinoid content (i.e. THC and CBD levels). These aspects are likely important for therapeutic efficacy and consumer safety, in particular for people with a compromised health status.

The potency of cannabis is associated with the extent to which the user will experience adverse effects. Since cannabis is mostly obtained through illegal means, THC can reach high levels, which may result in unwanted physical and psychological effects. Over the last years THC levels have increased significantly in cannabis sold in unregulated markets, ranging from concentrations lower than 1% to extreme cases such as 30%. This general increase heightens the risks of side effects and harms among cannabis users. Studies suggest that higher levels of use and THC are associated with an increased risk of side effects and health hazards (including psychoses, anxiety and dependence) (Marconi et al., 2016; Freeman & Winstock, 2015). Since CBD modulates effects caused by THC, the cannabinoid can play an important protective role when it comes to the side effects of cannabis (Brunt et al., 2014).

Interviewees' self-reports regarding cannabis' effects and efficacy have to be interpreted carefully, when making statements about cannabis' effects related to the chemical constellation of cannabis products and particular administration methods. Looking at findings from previous studies gathering objective data on cannabis products' chemical compositions, I expect the self-reports in this study might be biased. Firstly, previous research found that the categorisations Sativa and Indica are not fully supported by scientific research and no longer accurate (McPartland, 2017; Elzinga et al., 2015; Hazekamp & Fishedick, 2012). Secondly, research found that cannabis strains sold in different stores under the same name (e.g. Kush) have divergent chemical compositions (Elzinga et al., 2015). Consequently, claims about the effects based on the names of cannabis strains or the two popular categorisations of herbal cannabis are probably inexact. Thirdly, previous studies have shown that the labels of cannabis products sold in unregulated markets are incorrect regarding cannabinoid content (Vandrey et al., 2015; Barrus et al., 2016; Bonn-Miller et al., 2017; Hazekamp, 2018). For instance, internet markets provide plenty of CBD products of which studies have shown that CBD is absent or they contain only negligible percentages (Bonn-Miller et al., 2017). The cannabis oils used by the interviewees in the present study were many times bought online or in stores in the Netherlands. These (semi-legal) products are mostly made from hemp plants, because hemp is allowed in several legislations and other cannabis varieties are not. In addition, the cannabis extracts market is currently poorly regulated. As a result, the levels of cannabinoids are many times very low in these products and differ from the claimed content on their labels (Hazekamp, 2018). If participants have tried out these products and felt no therapeutic effect it might be due to the low proportion of active ingredients.

Medicinal cannabis users' own experiences with different CBD and THC concentrations can be a starting point for further research, since evidence is currently lacking on the ratios of cannabinoids and their effects. In addition, a more precise taxonomy is necessary that is not based on traditions rooted in the recreational cannabis culture (e.g. Sativa and Indica) (Hazekamp & Fishedick, 2012). It is important to keep in mind that most participants in the current study were using cannabis products obtained from unregulated sources (e.g. black market, online, self-supply, etc.). Concluding, we can say that assertions about the effects of particular cannabinoids and cannabis products should be handled with care. However, this does not mean that users' self-reports are useless. Common trends and recurrent themes are rich starting points for future (clinical) research.

## Chapter 4

### Cannabis use motives

#### *Introduction*

In this chapter I will explore the meaning of the concept of ‘medicinal cannabis use’. Other authors have argued in the past that the boundaries between recreational and medicinal cannabis use are blurred (Athey et al., 2017; Bostwick, 2012; Pedersen & Sandberg, 2013; Reinerman et al., 2011; Pedersen, 2015). The findings in this chapter contribute to this (theoretical) debate surrounding the conceptualisations of medicinal and recreational cannabis use.

The survey results present participants’ experiences with and attitudes towards recreational cannabis use (see 1.1). The subsequent section of the survey results present survey participants’ motives for using cannabis (see 1.2).

In the introduction section of the interview results, I first discuss interviewees’ personal experiences with recreational cannabis use to contextualise interviewees’ meanings of and attitudes towards recreational and medicinal cannabis use (see 2.1). The interview section then moves to the discuss what is meant by ‘medicinal cannabis use’ by medicinal cannabis users themselves (see 2.2). Participants’ own views on the suggested blurred boundaries are explored. The following section elaborates further on this question by comparing medicinal and recreational cannabis use on several dimensions. These comparisons include motives for use, cannabis use patterns, effects and setting of use (see 2.3). Finally, discourse analyses give more information about how medicinal and recreational cannabis use are defined and conceptualised (see 2.4).

The chapter then moves to discuss pleasure in the context of medical cannabis use. While pleasure is a typical characteristic of using recreational drugs, it is absent in the discourses on medical treatments. Patients enjoying their treatments appears to be inappropriate. As a consequence, pleasure can be an important point of differentiation between medicinal and recreational cannabis use (see 2.5). In the final section of this chapter I explore if interviewees think of cannabis as a ‘drug’ and how cannabis relates to other illicit drugs (see 2.6).

## 1. Results of the survey

### 1.1 Recreational cannabis use

The following survey questions discussed, focus on self-identified medicinal cannabis users' experiences with and attitudes towards recreational cannabis use. As discussed in the introduction of this empirical results section, I asked participants to indicate if they 'currently use cannabis recreationally', 'have used cannabis recreationally in the past' or 'never have used cannabis recreationally'. Participants who had experience with recreational cannabis use were asked whether or not they used cannabis prior to their medicinal cannabis use (see **table 37**).

About half of the survey participants were currently using cannabis recreationally alongside their cannabis use for health purposes (n=184). About a quarter were recreational cannabis users in the past, but no longer at the time of the survey (n=96) and 21.3% have never used cannabis for recreational purposes (n=81). Recreational cannabis use was more prevalent among younger participants. 82.7% of the participants who have ever used cannabis recreationally were younger than 51. Most of the participants who have experience with recreational cannabis use, were using cannabis recreationally prior to their medicinal cannabis use (n=255; 91.1%), only a small percentage (n=22; 7.9%) started using cannabis recreationally when they were already using it for health purposes (see **table 37**).

**TABLE 37: SURVEY PARTICIPANTS' EXPERIENCES WITH RECREATIONAL CANNABIS USE**

<b>Ever recreational use (n=370)*</b>	<b>N</b>	<b>%</b>
Current recreational use	184	48.3
Former recreational use	96	25.2
Never used cannabis recreationally	81	21.3
I don't know	9	2.4
<b>Recreational use preceded medicinal use (n=280)**</b>		
Yes	255	91.1
No	22	7.9
I don't know	3	1.1

\*N=370, because 11 participants did not answer these questions because they did not complete the survey entirely.

\*\*N= 280, because this question was only shown to participants who indicated using cannabis recreationally currently or in the past in a previous question.

In order to be able to compare participants' medicinal and recreational cannabis use patterns I asked participants about their frequency of use and cannabis dose when using for recreational purposes. To measure frequency of use participants had to indicate how often they used cannabis recreationally the past twelve months. On a Likert scale respondents had to indicate if their dose for recreational use was 'much higher', 'higher', 'the same', 'lower' or 'much lower' compared to their dose when using medicinally (see **table 38**).

The majority of the participants who have ever used cannabis recreationally reported using cannabis recreationally at least once a week (n=143; 58.4%). Almost a quarter indicated using cannabis a couple of times a year (n=57; 23.2%). There were more people who reported that the dosage that they used for

recreational purposes was the same as their dosage for medicinal purposes (n=125; 47.3%) than people who reported higher (n=78; 29.5%) or lower dosages (n=61; 23.1%) (see **table 38**).

**TABLE 38: SURVEY PARTICIPANTS’ RECREATIONAL CANNABIS USE PATTERNS**

<b>Frequency of recreational cannabis use (n=245)*</b>	<b>N</b>	<b>%</b>
Once to a couple of times a year	57	23.2
One to a couple of times a month	45	18.4
One to a couple of times a week	72	29.4
Daily	71	29.0
<b>Dose recreational use compared to dose medicinal use (n=264)**</b>		
Higher	78	29.5
The same	125	47.3
Lower	61	23.1

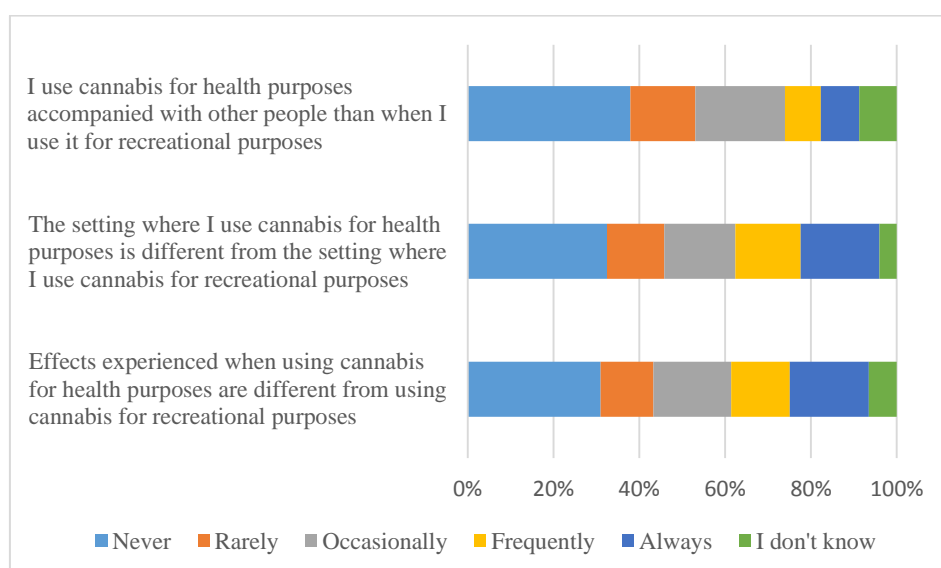
These questions were only shown to participants who said they have experience with recreational cannabis use (n=280).

\* N=245, because three participants did not answer these questions because they did not complete the survey entirely. 25 participants selected ‘I don’t know’ and seven participants selected the option ‘I prefer not to answer’.

\*\* N=264, because two participants did not answer these questions because they did not complete the survey entirely. 14 participants selected ‘I don’t know’.

Participants were asked if the effects they experienced, the setting and the accompanied people when using cannabis for health purposes were different from when using cannabis for recreational purposes. Almost half of the participants thought that the setting (n=127; 45.8%) and the effects experienced (n=120; 43.7%) never or rarely differ between using for recreational and medicinal purposes. More than half indicated using cannabis for health purposes never or rarely with other people than when using for recreational purposes (n=147; 53.1%) (see **figure 11**).

**FIGURE 11: RECREATIONAL VERSUS MEDICINAL CANNABIS USE (N=277)\***



\*N=277, because these statements were only shown to participants who said they have experience with recreational cannabis use (n=280). Three participants did not answer these questions because they did not complete the survey entirely.

I presented all the survey participants statements about recreational cannabis use. On a Likert scale participants had to indicate to what extent they disagreed or agreed with these statements (see **table 39**). Over sixty percent think that recreational cannabis use ‘can be therapeutically valuable’ (n=251) and ‘can be considered to be medical at times’ (n=237). There are about as many people who agree with the statement that recreational and medical cannabis use are difficult to distinguish as people who disagree (39.6% vs 37.3 %). Over seventy percent of the total sample are not opposed to recreational cannabis use (n=265) and about half disagrees with the statement that recreational cannabis use impairs health (n=199). A similar proportion of the sample would (still) use cannabis recreationally when it would be legalised (n=198). About half of the sample would not stop using cannabis when no longer needed for medical purposes (n=186) and about a quarter said they would (n=87) (see **table 39**).

**TABLE 39: SURVEY PARTICIPANTS’ ATTITUDES TOWARDS RECREATIONAL CANNABIS USE (N=359)\***

	Disagree		Nor disagree, nor agree		Agree		I don’t know	
	N	%	N	%	N	%	N	%
Recreational cannabis use can be therapeutically valuable	42	11.7	48	13.4	251	69.9	18	5.0
Recreational cannabis use can sometimes be considered to be medical	49	13.6	51	14.2	237	66.0	22	6.1
Recreational and medicinal cannabis use are difficult to distinguish	134	37.3	65	18.1	142	39.6	18	5.0
I am an opponent of recreational cannabis use	265	73.8	49	13.6	34	9.5	11	3.1
Recreational cannabis use impairs health	199	55.4	101	28.1	29	8.1	30	8.4
When using cannabis would become legal I would (still) use it recreationally	87	24.2	53	14.8	198	55.2	21	5.8
When I would be freed from my complaints and conditions, I would definitely stop using cannabis.	186	51.8	50	13.9	87	24.2	36	10.0

\*N=359, because 22 participants did not answer these questions because they did not complete the survey entirely.

In the analysis, the three subgroups’ attitudes regarding recreational cannabis use were compared. The belief that recreational cannabis use can be therapeutically valuable and that it can be considered to be medical at times is supported least by exclusively medicinal cannabis users ( $p < 0.001$ ). Current recreational users agree most with the statement that medicinal and recreational cannabis use are difficult to distinguish. Exclusively medicinal cannabis users agree most with the statement that they are opposed to recreational cannabis use, and are the least likely to use cannabis recreationally when it would be legalised ( $p < 0.001$ ). Exclusively medicinal users are most likely to agree with the statement that they would stop using cannabis when it is no longer needed for health purposes (see appendix 1, **table 39a**).

Participants were asked if they spend their leisure time with people who use cannabis recreationally. On a Likert scale they had to select an answer option ranging from ‘nobody’ to ‘everybody’. The results show that current recreational users spend their leisure time with more people who use cannabis recreationally compared to previous recreational users ( $p = 0.002$ ) and exclusively medicinal cannabis users ( $p < 0.001$ ) (see **table 40**).

**TABLE 40:** NUMBER OF PEOPLE THAT USE CANNABIS RECREATIONALLY WITH WHOM SURVEY PARTICIPANTS SPEND THEIR SPARE TIME WITH

	Total (n=321)*		Exclusive medical (n=69) <sup>a</sup>		Previous recreational (n=83) <sup>a</sup>		Current recreational (n=162) <sup>a</sup>	
	N	%	N	%	N	%	N	%
Nobody	28	8.7	23	33.3	3	3.6	2	1.3
The minority	158	49.2	42	60.9	50	60.2	60	37
About half	65	20.2	1	1.4	14	16.9	49	30.2
The majority	68	21.2	3	4.3	16	19.3	49	30.2
Everybody	2	0.6	0	0.0	0	0.0	2	1.3

\*N=321, because 36 participants did not answer these questions because they did not complete the survey entirely. 22 participants selected the answer 'I don't know' and two participants selected the option 'I prefer not to answer'.

<sup>a,b</sup> groups with the same superscript differ significantly from each other at a  $p < 0.05$  tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni.

## 1.2 Motives for cannabis use

The following question was designed to identify medicinal cannabis users' motives for using cannabis. Similar to the work of Lankenau et al. (2018) and Bonn-Miller et al. (2014), the items assessing motives for cannabis use were based on the 36-item Comprehensive Marijuana Motives Questionnaire (CMMQ) developed by Lee et al. (2009). These cover mainly non-medical motives. Items were added which include motives for using cannabis reported by medicinal cannabis users (Reinarman, 2011; Belle-Isle & Hathaway, 2007). The survey participants had to indicate if they used cannabis for these purposes during the past twelve months.

The top five most reported motives for use among the survey sample can be categorised as medical motives. Over ninety percent of the total sample and of each subgroup have used cannabis to control symptoms the past twelve months. Over eighty percent indicated having used cannabis for sleep purposes and for physical and mental relaxation (see **table 41**).

Regarding purposes of use the past twelve months, I found many significant differences between the three subgroups. Exclusively medical users were least likely and current recreational users were most likely to use cannabis for the following purposes: to relieve boredom, because it was a special occasion, because it is fun, to think differently, to enjoy the effects, to sleep, to divert attention from complaints, for physical relaxation, for mental relaxation, to get high, to get a peace of mind, to get more energy, to improve focus, to enjoy leisure activities, because it is nice with friends, to feel more confident, to let off steam, and to get more inspiration. Previous recreational users formed the middle group (see **table 41**). Exclusively medical users were less likely to use cannabis to forget their problems, than both recreational subgroups. Finally, current recreational users were more likely to use cannabis to counteract the psychoactive effects of other psychoactive drugs and because they were under the influence of alcohol than both other subgroups (see **table 41**).



**TABLE 41:** SURVEY PARTICIPANTS WHO HAVE USED CANNABIS USE FOR THE FOLLOWING PURPOSES DURING THE PAST 12 MONTHS

	Total (n=381)		Exclusive medical (n=81)		Previous recreational (n=96)		Current recreational (n=184)	
	N	%	N	%	N	%	N	%
<b>Medical motivations</b>								
To control symptoms	368	96.6	75	92.6	93	96.9	180	97.8
Physical relaxation	337	88.5	48	59.3 <sup>a</sup>	89	92.7 <sup>a</sup>	181	98.4 <sup>a</sup>
To help you sleep	335	87.9	57	70.4 <sup>a</sup>	83	86.5 <sup>a</sup>	175	95.1 <sup>a</sup>
Mental relaxation	319	83.7	40	49.4 <sup>a</sup>	82	85.4 <sup>a</sup>	179	97.3 <sup>a</sup>
To get peace of mind	295	77.4	33	40.7 <sup>a</sup>	74	77.1 <sup>a</sup>	170	92.4 <sup>a</sup>
To divert the attention from my complaints	267	70.1	23	28.4 <sup>a</sup>	70	72.9 <sup>a</sup>	157	85.3 <sup>a</sup>
To improve your focus	210	55.1	18	22.2 <sup>a</sup>	47	49.0 <sup>a</sup>	130	70.7 <sup>a</sup>
To get more energy	197	51.7	21	25.9 <sup>a</sup>	46	47.9 <sup>a</sup>	117	63.6 <sup>a</sup>
To forget your problems	179	47.0	10	12.3 <sup>a,b</sup>	47	49.0 <sup>a</sup>	112	60.9 <sup>b</sup>
To make you feel more confident	138	36.2	7	8.6 <sup>a</sup>	29	30.2 <sup>a</sup>	89	48.4 <sup>a</sup>
To counteract other medicines' side effects	75	19.7	10	12.3	16	16.7	44	23.9
To be able to take medicines	58	15.2	7	8.6	14	14.6	32	17.4
<b>Non-medical motivations</b>								
To enjoy the effects of it	285	74.8	18	22.2 <sup>a</sup>	74	77.1 <sup>a</sup>	176	95.7 <sup>a</sup>
To enjoy leisure activities	268	70.3	22	27.2 <sup>a</sup>	62	64.6 <sup>a</sup>	166	90.2 <sup>a</sup>
To allow you to think differently	256	67.2	13	16.0 <sup>a</sup>	64	66.7 <sup>a</sup>	161	87.5 <sup>a</sup>
To get high	249	65.4	10	12.3 <sup>a</sup>	54	56.3 <sup>a</sup>	168	91.3 <sup>a</sup>
Because it is fun	249	65.4	5	6.2 <sup>a</sup>	59	61.5 <sup>a</sup>	167	90.8 <sup>a</sup>
To let off steam	235	61.7	7	8.6 <sup>a</sup>	61	63.5 <sup>a</sup>	150	81.5 <sup>a</sup>
It is nice to do with friends	222	58.3	4	4.9 <sup>a</sup>	51	53.1 <sup>a</sup>	154	83.7 <sup>a</sup>
Because it was a special occasion	170	44.6	2	2.5 <sup>a</sup>	33	34.4 <sup>a</sup>	122	66.3 <sup>a</sup>
To relieve boredom	156	40.9	3	3.7 <sup>a</sup>	32	33.3 <sup>a</sup>	108	58.7 <sup>a</sup>
To soften the effects of other psychoactive substances	63	16.5	2	2.5 <sup>a</sup>	8	8.3 <sup>b</sup>	49	26.6 <sup>a,b</sup>
Because you were under the influence of alcohol	60	15.7	3	3.7 <sup>a</sup>	10	10.4 <sup>b</sup>	42	22.8 <sup>a,b</sup>

<sup>a,b</sup> groups with the same superscript differ significantly from each other at a significance level of  $p \leq 0.017$ , tested using Chi<sup>2</sup> test.

## 2. Results from the face-to-face interviews

### 2.1 Experience with recreational cannabis use

Most interviewees' first introduction to cannabis was in their adolescence in a non-medical context. Some of them had a bad first experience (e.g. paranoia, throwing up, etc.), and for this reason they doubted about using cannabis again, this time in a medical context. Several other interviewees simply disliked the experience and did not understand "*all the fuss about it*" (i.e. why someone likes to use cannabis and to feel 'high'), and decided not to continue using it. Only a few their first experience with cannabis was when using it for medicinal purposes at an older age. For instance, **Dirk (65)** tried cannabis for the first time at the age of 47, to cope with his sleep problems.

27 interviewees were currently using cannabis recreationally, seven interviewees had used cannabis recreationally in the past but no longer at the time of the interview, and lastly 28 individuals have been always exclusively medicinal users. Male interviewees (21 out of 31) were more likely to have experience with recreational cannabis use than female interviewees (13 out of 31). Of the respondents who have used cannabis in the past some were regular users, others used it sporadically and the remaining tried cannabis one or a couple of times in their youth and a long time before their medical use. However, several interviewees were unsure about the meaning of the concept 'recreational cannabis use' and their answers were ambivalent and ambiguous on the questions if they had experience with recreational cannabis use and if they were using it recreationally at this moment. Consequently, these numbers are merely an indication.

Most interviewees were not opposed to recreational cannabis use. Only two respondents expressed themselves firmly negatively about using cannabis recreationally due to its addictive potential and the health risks associated with smoking. They both used low potent cannabis extracts orally to alleviate chronic pain.

### 2.2 What does 'medical cannabis use' mean to self-identified medicinal cannabis users?

In the interviews I asked respondents what 'medical cannabis use' meant to them, to unravel respondents' meanings and attitudes towards the concept. Indirectly, I also noticed that respondents had particular interpretations of the concept of 'medical use'. One of the eligibility criteria to participate in this study was 'the use of cannabis for health reasons currently or in the past'. It was up to the respondents themselves whether or not they thought that they used cannabis for health purposes. This implies that we can already learn from the interviewees' main medical conditions for which they used cannabis, since they consider these to be health purposes. In the first empirical chapter I listed all interviewees' medical conditions and symptoms for which they used cannabis.<sup>38</sup> These long lists

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<sup>38</sup> See PART IV Chapter 1 section 2.3 Medical conditions and symptoms, **Table 1.18:** Medical conditions of the interviewees

illustrated the diversity of medical conditions ranging from self-diagnosed mental health problems (e.g. insomnia) to life-threatening diseases (e.g. cancer).

Participants' narratives revealed their interpretations of the concept medicinal cannabis use. Many of the self-identified medicinal cannabis users had broad interpretations of the concept 'medicinal' and definitions of legitimate medical use. They believed that medical indications valid for medicinal cannabis use were wide-ranging, and cannabis benefited health in general.

Several interviewees thought that the use of cannabis can be considered as medical when it is used to cope with psychological problems that are not caused by a diagnosed mental disorder (e.g. stress, restlessness, social anxiety, sleep problems, etc.), because of its relaxing and calming properties. A few interviewees believed that there were no significant differences between medicinal and recreational cannabis use in the end. Five respondents stated that whereas adolescents might use cannabis to experiment and indulge in intoxication, when adults use cannabis there is always a medical or therapeutic purpose involved. They reasoned that people who use cannabis recreationally do not necessarily achieve direct physical medicinal effects. However, using the plant was considered always therapeutic beneficial due to its relaxing properties. In this way, recreational cannabis users were believed to medicate themselves unknowingly. For these respondents it was not the way and for which purposes cannabis was used that made it a medicine, but because of its medical properties it was inherently considered a medicine. They argued that they only knew a few or no one of their own age who used recreationally.

In reflecting about recreational cannabis use, **Vivian (53)**, who used cannabis for chronic pain, concludes that the relaxing properties of cannabis are therapeutically beneficial.

*“When I want to be completely relaxed and absorbed in a movie in the weekend, that’s recreational. But then again, recreational... medicinal... Because what isn’t better for healing? Actually relaxing. You can’t say it’s only recreational. No, when you’re fully relaxed, you forget your worries and this also works on your body.” [Vivian/F/53]*

The end of Vivian's quote illustrates how most respondents interpret medicinal use as the improvement of bodily or physical conditions. **Frank (47)**, who suffered from ADHD and physical health problems due to a car accident, explained that cannabis use is medicinal when people self-medicate with it for mental health problems. He also talked about using cannabis to cope with stress which he considers legitimate cannabis use.

*“At the age of 32 I visited a professor and I told him that cocaine relaxes me. For him this was the proof that I had ADHD, because the brains of people with ADHD react differently on those substances. From then on he started prescribing Ritalin®. So is my cannabis use medicinal? I think the evidence is there, it’s medicinal, even cocaine is medicinal. Is it wise? That’s something completely different. Do you need it? That’s an important question. If you have a hard day at work and you are feeling down, Jesus Christ, smoke a joint. You’ll be able to forget your shit for a while, what is wrong with that? Why should someone decide for someone else what is ethical? I need cannabis also medicinally because I was born with a very assertive personality and I’ve been through*

*so much shit in my life, that I have a lot of inner anger. So I need cannabis to prevent me from an outburst. [Frank/M/47]*

Other participants believed that medicinal and recreational cannabis use are distinguishable, but that the distinctions between the two types of use were unclear. For instance, **Ashley (21)** living with scoliosis stated that her friends used cannabis to cope with stress and she was wondering if this could be still called recreational cannabis use. Multiple respondents experienced difficulties in explaining and comparing ‘recreational’ and ‘medical’ cannabis use with regards to their own and others cannabis use. While some participants had very clear thoughts of the concept of ‘medicinal cannabis use’, others’ expressed ambivalent interpretations of the concept. They noted that the lines between the two were “thin”, “blurred” and it was hard “where” and “how” to draw these lines. From their narratives it was clear that cannabis use did not always fit in one or the other category, but that that there is more nuance and diversity than ‘medicinal’ and ‘recreational’ cannabis use.

*“Recreational users, I think those people use cannabis for relaxation. Of course there are ADHD patients and so on ... well... actually that is also medical. I think the dividing line is very thin. I know someone with ADHD who smokes too and that is the only way for that person to have a normal life, to be a bit calmer. But those people might use it from morning until night. Recreational use...[sighs], “what is that?”. Is it sitting around a campfire and smoking? Or people who are not ill who also use it? I think they also function better on cannabis, for instance they write better, or... [sighs].” [Sabine/F/51]*

*“I think it’s hard to draw a line between medicinal and recreational cannabis use. I sincerely don’t know where to draw it, it’s really vague. Like in the US, many people use it as a medicine. They have a prescription for thousand things, like anxiety, depression, sleep disorders, migraine, etc. But on Facebook and fora I see that everyone also enjoys using it and thinks it’s really fun. It is the same as if you would take a Panadol® and you would like it a lot. I do think that CBD oil is purely medicinal, because you don’t feel anything basically. I mean it isn’t psychoactive, let me put it that way. You cannot become high of it. So this is medicinally, but...yeah uhm... [laughs].” [Jonas/M/25]*

Earlier we saw that many interviewees use cannabis for multiple health issues. In cases when respondents had diverging motives (physical and psychological) for using cannabis, it was not always clear which motives were considered as health purposes by the respondents and which were not. For instance, at the time of the interview **Marie (43)** ingested CBD paste orally on a daily basis in the hope it would prevent breast cancer. In the past she smoked joints to cope with the loss of her sister’s daughter.

*“The joints... that was really to numb myself. I know and admit that too. But my sister’s child died and that was really... [takes a deep breath]. And cannabis helped me a lot. Back then, for me it was medicinally. But actually that is not true, if you do it because you cannot handle reality... I didn’t have anything noteworthy except for heartache ... But yeah is this medicinal or recreational? From both a bit right...? I don’t mind that I did it. I really needed it back then, I couldn’t function normally without ” [Marie/F/43]*

In the case of one respondent it was unclear how he defined his cannabis use. For over thirty years, **Patrick (54)** used cannabis daily from morning till evening. He was diagnosed with schizophrenia and he used cannabis to keep himself calm. Otherwise the boredom and the loneliness made him feel as if he was going mad. Sometimes he referred to this use as ‘recreational’ and other times as ‘medicinal’. Whereas the CBD oil he took for his tumours due to metastatic lung cancer was always referred to as medicinal use. His schizophrenia was only sometimes an indication for medicinal use, while cancer was always an indication to him. This became clear when he answered some interview questions with only the cancer in the back of his head, while for other questions he considered his cancer as well as his schizophrenia.

Other respondents’ narratives contained more narrow interpretations of the concept of medical cannabis use, as they believed that only certain medical conditions were legitimate and acceptable. Some of them knew other “*medicinal*” cannabis users of whom they were not sure if those people genuinely needed cannabis for health reasons (e.g. ADHD) (cf. Pedersen & Sandberg, 2013). As **Chris (37)** said “*I have a comrade who says he uses it for medical reasons, he has ADHD, but it is more recreational though.*” He continues by using the following argument: “*He takes a lot more drops of cannabis oil in the evening, that is just to watch TV all night long*”. **Danny (55)**, who survived lung cancer, argued that three palliative patients he knew “*use cannabis more recreationally*” than he did. He believed that they smoked cannabis recreationally, because they coped with pain through mental distraction while his pain was relieved physically. His narrative suggests there are gradations in the types of use, and illustrates the perceived superiority of physical therapeutic effects above mental therapeutic effects.

A subpopulation of self-identified medicinal cannabis users were convinced that recreational and medical cannabis use were (completely) unlike. They believed that using cannabis to relax and de-stress was equal to recreational cannabis use. Most of these participants did not use cannabis for recreational purposes and emphasised the benefits of medicinal cannabis use and the risks of recreational cannabis use. **Isabelle (46)**, who vaporises cannabis for chronic pain due to scoliosis, strongly emphasises:

*“I think there is an immense difference between medicinal and recreational cannabis use. Smoking a joint has absolutely nothing to do with medical use, nothing at all. To me recreational use is feeling stoned. The purpose of medicinal use is to have medicinal effects and not a stoned effect. It has nothing to do with drugs, with the misery caused by drugs to addicts and junkies.”* [Isabelle/ F/46]

For Isabelle and several other interviewees the distinction between recreational and medicinal cannabis use regarding their own use was personally meaningless, because they never experienced psychoactive effects or a ‘high’ and there were no other things that linked them nor their use to recreational cannabis use (e.g. having no recreational history). For these interviewees it was easy to claim that all their use was medicinal (Newhart, 2013). Even if they experienced certain mental effects, these were not interpreted in a recreational framework. Asking these interviewees if they used cannabis recreationally, would be the same as asking patients who take analgesics to relieve pain if they use these recreationally.

To them this question might sound irrelevant and easy to answer. Since they were not interested in and had no need of using cannabis for non-medical purposes.

### 2.2.1 Medical cannabis user identity: what is a real medical cannabis patient?

A few respondents (n=5) stated that they thought that they were no “*real*” or “*typical*” medical cannabis patients compared to other medical cannabis users. For this reason they were doubting the eligibility of their participation in the study because of their purposes of use. Many times, these ‘others’ were a fictitious group of medical cannabis patients dealing with ‘more severe’ medical indications and for whom using cannabis was considered to be more important (e.g. cancer, epilepsy, etc.). **Leo (54)** stated that he was somewhere in-between medical and recreational cannabis use because he self-medicated with cannabis for chronic pain. **Dirk (65)** thought that he was no typical medicinal cannabis user because external factors were the cause of his insomnia, for which he smoked cannabis. Dirk said he used cannabis for “*what is called medicinal*”. **Luc (64)** said that he was no real medical cannabis patient because he used cannabis “*more as a preventive medicine, and for others it is a matter of life and death, or essential for their quality of life*”. Similar to the work of Lankenau et al. (2018a) their own conceptualisations of ‘legitimate’ or ‘real’ medical use did not always match their own motives for use. **Roger (53)** was in doubt about his participation due to the way cannabis alleviates his cluster headaches:

*“I’m not sure if it is meaningful that you come to talk to me. I must say honestly in the light of your study, in the beginning I was doubting “Am I using it for medicinal purposes?” For other people, like epileptics, it has a direct medical consequence. In my case, I don’t know. Is it medicinally? Actually, strictly speaking I would say no, because it doesn’t have a direct link with my pain and I’m not getting better. But I accepted your request because I believe that cannabis enables me to deal with pain and in that way it is actually a painkiller, isn’t it? Painkillers don’t heal, they just ensure that you can handle the pain.” [Roger/M/53]*

The majority of the interviewees in this study self-identified as medicinal cannabis users. Most of the participants who considered themselves recreational users as well, thought they were medicinal cannabis users in the first place, as the medical purpose of their use was the most important.

*“I consider myself a medicinal user, because it is really necessary. I really have to use it every day, otherwise I can’t even talk, because I have slurred speech. I cannot communicate with you, due to the pain and because it is this tiring. Because of this I’m really a medical user. And recreational... I do love the plant and I also like to enjoy a joint and taste new strains. I like that, but I am a medical cannabis user.” [Jolien/F/25]*

### 2.3 Medicinal versus recreational cannabis use: unravelling the concepts

Interviewees were asked to reflect on the meaning of the concepts ‘medical’ and ‘recreational’ cannabis use and their differences. When participants discussed medicinal cannabis use they contrasted it many

times spontaneously with recreational cannabis use to illustrate their dissimilarities. It seemed that participants could not explain medicinal use without referring to recreational use and vice versa. Lancaster et al. (2017) found that medicinal cannabis use was defined in Australian policy by contrasting it to recreational cannabis use. My interviews show that also on the individual level the meaning of medicinal cannabis use is construed on the basis of ‘the absence of the presence of recreational use’ (Lancaster et al., 2017).

Other authors have employed the term ‘therapeutic use’ for unsupervised medical cannabis use or cannabis use that is assumed to be beneficial for one’s health more generally (e.g. Fischer et al., 2015). The following interviewee made a distinction between ‘medicinal’ and ‘therapeutic’ cannabis use. He and two other participants considered cannabis use ‘medicinal’ only when it is supervised by a physician.

*“Medical use is when you have a real condition. So to control this condition that is documented under supervision of a physician. And yeah therapeutic... I can imagine when you have worked all day in your garden and you are not used to this, that your back hurts in the evening and your muscles are stiff, and that you use cannabis to relax. Yeah okay, but this necessity is not in proportion compared to medical use.” [Tom/M/37]*

Most participants did not speak of the necessity of the supervision of medicinal cannabis by a physician, instead the purpose of use was the most important characteristic that determined whether or not cannabis use was defined as medical.

### 2.3.1 Motives for use

First and foremost, interviewees explained and compared recreational and medicinal use with regards to the different motives for use. Medicinal cannabis use was described by my participants as a necessity and having a specific purpose. This means that when medicinal users would not be able to use cannabis to treat their conditions, this would have severe consequences for their daily lives and quality of life. Most respondents stated that medicinal cannabis use was intended to treat a problem, a physical diagnosable condition in the first place (e.g. pain, hernia, arthrosis, cancer, spasms, etc.). Interviewees for whom mental health problems were their main indication for using cannabis, also mentioned more often the treatment of physical health problems when asked what medicinal cannabis use meant to them. During the interview with **Niels (28)**, he explained that he used cannabis mainly for anger management and self-control. However, when I was asked if he used cannabis for medical purposes, he confirmed by first stating that he used cannabis for physical pain. Only later he mentioned his mental health problems.

*I: “Would you say that you use cannabis for medicinal purposes?”*

*R: “Yes, for physical pain, and also to calm down and to be able to function normally socially. So just to be able to talk to other people, otherwise you can’t get a word out of me. I never say anything.” [Niels/M/28]*

When I asked participants what medicinal cannabis use meant to them, some referred to other and more severe cases than their own, such as cancer patients using cannabis for symptom relief. It appeared that their own conditions did not meet the criteria of their own definitions of medicinal cannabis use (Lankenau et al., 2018a).

When participants discussed recreational cannabis use they referred primarily to the purpose of achieving certain stages of intoxication, i.e. being ‘high’ or ‘stoned’. As one interviewee, who had experience with recreational cannabis use, recounted, “*What is the pinnacle of recreational use? Getting high and enjoying it*”. Other frequently reported motives for recreational use were relaxation, lying down the entire day, feeling cheerful, having fun, socialisation motives, laughing, and using cannabis without specific purposes, and by individuals having no health problems. Next, recreational cannabis use was discussed in the contexts of the intensified enjoyment of certain activities, for instance attending concerts, reading a book, walking in nature, etc. A high number of participants explained their own recreational cannabis use by comparing it to drinking alcohol. Participants thought that the motives of people who drink alcohol moderately were similar to people using cannabis recreationally, as they believed it was both consumed for relaxation (e.g. after a stressful day at work).

Some respondents reasoned that one’s cannabis use is medicinal when he or she has an impaired health and uses cannabis to be able to have a “*normal health*” (=recovery), everything “*above*” (=enhancement) was considered to be recreational cannabis use. They thought that when people have their symptoms under control by using cannabis it is medicinal use, however when someone starts using higher amounts than necessary, it becomes recreational cannabis use.

*I: “Would you say that you use cannabis recreationally?”*

*R: “Uhm... sometimes. I think the same as someone who uses alcohol recreationally.”*

*I: “Does this differ from using medicinally?”*

*R: “Yes, then it is more about the taste, but also the effect. Actually, purely recreationally? It is also pain relieving, but it is stronger pain relieving. You need to compare it with someone who survives the entire week on Perdolan® and Zaldiar® to keep control over his pain at his job. In the weekend when he does not have to go to work, he does use the morphine product to get rid of the pain completely.” [Tom/M/37]*

### *2.3.1.2. Blurred boundaries between motives for cannabis use*

Cannabis was mostly used to suppress symptoms caused by particular medical conditions. Many interviewees used cannabis for multiple conditions and/or symptoms simultaneously. Other motives for using cannabis varied widely. First of all, respondents used cannabis for what can be called ‘instrumental’ purposes, for instance, to be productive (e.g. at work and working in the garden); for cosmetic use (e.g. night cream and lip balm); for muscle relaxation after a workout; to improve focus (e.g. when cooking); to improve motivation; to cope with boredom; to cope with isolation; to improve concentration (e.g. translation of texts), for the stimulation of appetite and enhancing the appreciation of food, etc. Two



men who were socially isolated due their chronic health problems, said cannabis prevented them from “*getting crazy*” because of constantly being at home alone.

Some of these examples can also be considered to be -what are called- ‘therapeutic’ purposes. Other examples of therapeutic use are the participants who used cannabis to cope with stress and to relax, for instance after an exhausting or stressful day at work. **Helena**, a 60 year old cancer patient, hoping to cure her cancer with cannabis oil, said she also took a drop of cannabis oil at times when she felt really tensed. **Carine (46)** stated that she smoked cannabis to cope with symptoms caused by her menopause addition to her usual use for chronic pain. **Ashley (21)** suffering from chronic pain due to a spinal disease, said that besides cannabis’ analgesic effects, it was also helpful for loosening mucus in the lungs, severe headaches, stress, depression and insomnia. **Anthony (50)**, an MS patient who ended his relationship the day before our interview, said that he was glad cannabis put him quickly to sleep so he did not had to worry about the breakup. The primary reason for his use was pain issues due to MS. **Maarten (37)**, a paralyzed patient in a wheelchair and a single father, encountered difficulties in finding home health nurses who provide daily assistance. When he did not have assistance it happened that he had to sleep in his wheelchair. Maarten, who spent most of his time by himself, explained how smoking cannabis helped him to cope with the stress caused by these kind of daily challenges.

A few participants thought of cannabis in more philosophic and spiritual terms. For instance, two interviewees believed that cannabis made them live a healthier life overall (e.g. eating healthier). One of them said that using cannabis also resulted in the same experiences as meditation. Two respondents noted that being under the influence of cannabis tempts them to philosophise about life and existential questions. **Philip (41)** talked about the holistic characteristics of cannabis and its special meaning to him: “*Cannabis has a very special place in my life, simply because it is everything in one. I sleep well because of it, it’s relaxing, it relieves my tinnitus, etc.*”

All these motives for using cannabis were not necessarily considered medicinal nor recreational by participants themselves. These ‘non-medical’ motives were also reported by exclusively medicinal cannabis users who did not consider their use to be recreational. For instance, **Anny (58)**, who suffered from ankylosing spondylitis (type of arthritis) and who used cannabis to relieve pain and for muscle relaxation, did not consider her cannabis use to be recreational. However, she explained that she was more concentrated when using cannabis. This helped her when she had to translate and revise texts for her profession.

**Sandra (42)**, stated that when she went for a walk she enjoyed smoking cannabis, and she used cannabis to focus when cooking and roller blading. She believed this was not equal to recreational use because she could not live without cannabis due to her ADHD. Two other female participants did not consider themselves recreational users. At the same time they believed that cannabis stimulated their creativity when painting. One of them thought of these mental effects more as (sometimes) pleasant side effects, since she needed cannabis for pain relief. She stated she would not be using cannabis if she was still healthy.

*“I do think it has a recreational result, but it’s not my intention to use it recreationally. I notice that I become more creative because of it, when I use it medically. I think that this is a part of life itself. Everything becomes more balanced, because in our Western world we always think in boxes. But I think because of cannabis everything becomes complete again, a whole, and this also includes being creative. I’m convinced that’s a primary need. So all your primary needs become much more balanced.”* [Sabine/F/51]

This quote in which Sabine noted *“I do think it has a recreational result, but it’s not my intention to use it recreationally”* might be an adequate description of the previous discussed examples. Many interviewees used cannabis for medical purposes in the first place, but achieved positive ‘non-medical’ results from it. For instance, one respondent who claimed not using cannabis for recreational purposes, mentioned that he drank less alcohol since he started using cannabis. He said that the desire for relaxation caused by drinking alcohol reduced because cannabis relaxed him as well. While these respondents were using cannabis not on purpose for these reasons, other interviewees did. This shows that the impact of cannabis went beyond strictly medical benefits as it affected other aspects of their lives.

I asked respondents if they thought they would still use cannabis if their conditions would have been remedied completely. Answers varied widely. Multiple interviewees who used cannabis exclusively for medical purposes thought that they would quit their use immediately or use it rarely because it was no longer needed. Seven respondents said spontaneously that it would be better if they would not need cannabis to be healthy and preferred not to use it overall. They preferred not having to be dependent on any kind of substance to live a normal life. This was one of the reasons why some found it unfortunate that they were using cannabis. Other participants reported very specific reasons to quit using cannabis, such as one woman who stated that she would stop because she could drive a car again and because of the high cost of medicinal cannabis use.

Other interviewees indicated continuing using cannabis because they enjoyed it. A frequent answer was that one would still use it, but less frequently. Participants spoke of sporadic use, mainly for relaxation purposes. These descriptions correspond with participants’ recreational cannabis use patterns before they became disabled. A couple of respondents thought that their use would be until the end of their days. A motive for continuing with cannabis was using it as a prophylactic treatment or for *“the maintenance of health”*.

### 2.3.2 Use patterns

Besides motives for use, differences between medicinal and recreational cannabis use came up with regards to use patterns. Certain methods of ingestion and cannabis products were identified as ‘medical’ ingestion methods, such as medically tested vaporizers, while others were typically referred to as recreational, such as smoking joints and hash. Cannabis oil, orally ingested, was commonly used for medicinal purposes, but rarely for recreational purposes. Hash was one of the cannabis products almost never used for medicinal purposes. Although the majority of self-identified medicinal cannabis users

smoked joints themselves, this administration method was associated more often with recreational cannabis use. **Willy (70)** believed that smoking cannabis with joints could never be considered medical cannabis use, because it is an “*unhealthy way of consuming cannabis used by people who are addicted and who want to have fun*”. He himself drank low-potency cannabis-infused milk to cope with chronic pain. Next, smoking cannabis pure, without tobacco was considered healthier and therefore “*more medical*”. **Jolien (25)**, living with MS and who had experience with recreational cannabis use, thought that it was impossible for her mother to experience medicinal effects from cannabis because she smoked a small amount of cannabis combined with high amounts of tobacco. Jolien added tobacco to her joints as well at first, but she reduced the amounts to zero in stages. This was part of the transition process from using recreationally to using medicinally.

Many interviewees believed that cannabis products used for recreational purposes contained higher THC percentages and the dose for recreational cannabis use was more often (considered) higher compared to medicinal use (Pedersen, 2015). For instance, **Louise (29)** who used cannabis both for recreational and medicinal purposes, said she used a stronger cannabis strain when using recreationally. In the end, the total amounts used by a medicinal cannabis user are likely higher than those of recreational cannabis users, because they use it more frequently. Interviewees’ recreational cannabis use patterns were characterised by using sporadically (e.g. once a week or once a month).

As mentioned previously, almost half of the interviewees were using cannabis medically as well as recreationally at the time of the interviews. The majority of them made distinctions between their own recreational and medicinal use patterns. When they used cannabis recreationally it was more often a higher dose, a stronger cannabis product, for other purposes, when they were off and/or in another (social) setting. **Luc (64)** noted that when he used cannabis oil as a “*preventive medicine*” right before he went to sleep he considered it medicinal cannabis use, while when he went to music festivals where he smoked joints he defined it as recreational cannabis use. He called his use “*integrated cannabis use*”. Respondents’ medicinal use was often described as “*more controlled*” than when using recreationally. Meaning that when using for recreational purposes less attention had to be paid to the dose, the type of product and ingestion method, as this was less important. **Vivian (53)** explained that when she used ‘medicinally’ (i.e. pain relief) she used not more than two drops of cannabis oil, while the dose was not really limited when using for recreational purposes. On the other hand, two female participants stated that their medicinal and recreational use patterns were intertwined. Using cannabis relieved their pain and spasms, but also made them feel happy and relaxed at the same time. They both used cannabis primarily at home, and thus their use patterns, setting of use and motives for use nearly always coincided.

### 2.3.2.1 Recreational versus medical cannabis products

Many interviewees called the cannabis products which they consumed ‘*medical cannabis*’. More often, they made a distinction between “*recreational cannabis*” and “*medical cannabis*”. It appeared that to those individuals recreational and medicinal cannabis were two distinct plants or products. “*Medical*

*cannabis strains and products*” were characterised by my interviewees by their specific therapeutic effects, e.g. suited for pain relief, sleep disorders, relaxation, etc.

The chemical composition of a cannabis product turned out to be essential for it to be considered medicinal. ‘Medical cannabis’ was often described as cannabis that contains high(er) levels of CBD, while cannabis destined for recreational use was considered to have higher percentages of THC. Multiple interviewees emphasised that CBD is non-psychoactive, and that it is important for therapeutic applications, but not for “*getting high*”. According to **Sophie (37)**, the herbal cannabis that can be bought in Dutch coffee shops is different from the herbal cannabis she bought in a Dutch pharmacy. Two other respondents claimed that their home-made cannabis-infused products could no longer be used in recreational contexts. All of them referred to the fact that their cannabis products were lower in potency.

*“All cannabis is medical, but there are particular types that have much less THC and much higher levels of CBD. I’m in favour of this. I have tried the real CBD-oil, which has no THC in it, and I thought this is it. Because than I have the medical properties, but then the feeling is completely gone.”*[David/M/39]

**Ashley (21)** who smokes cannabis for chronic pain, defines CBD oil as a medicine because it is non-psychoactive and because the method of ingestion resembles a typical conventional administration method: “*I have used CBD oil, it looks like nose drops and you have to put it on a regular cigarette. You will not be stoned from it. It is a really purely a medicine*” [Ashley/F/21]. **Mary (58)** explained that she used “*recreational cannabis*” bought at a Dutch coffee shop, for recreational purposes and “*medicinal cannabis*”, bought at a pharmacy, for medicinal purposes. According to Mary, the effects of these two cannabis products were distinct.

*R: “Feeling high of the medicinal oil or flowers...not at all. But you cannot compare the [medicinal] flowers with the ordinary..., with the recreational cannabis. You do not get high on it.”*

*I: “So, you say you don’t feel high on the medicinal cannabis?”*

*R: “You don’t get high on it. No, no. It only works as a painkiller.”*

*I: “But you also do not feel for example more relaxed? Or nothing at all?”*

*R: “Yes, you will feel relaxed, ‘chill’ like we call it in our music world. But, not high like recreational cannabis. From recreational you can get really..., you can get into a trance state. And that is not the case with medicinal cannabis, that is really pain and spasms. You may feel woozy, but no high effect.”* [Mary/F/58]

This difference in psychoactive experience might be due to the chemical constellation of Mary’s cannabis products. However, the main psychoactive ingredient of cannabis (i.e. THC) is certainly not absent in her ‘medicinal cannabis’. This cannabinoid product contained 22 % THC and less than 1% CBD. The fact that Mary stated that she does not get ‘high’ on ‘medicinal cannabis’ but does on ‘recreational cannabis’ is for this reason remarkable. Methods used to administer cannabis also influence the effects experienced by the user, but Mary smoked both her ‘recreational’ and ‘medicinal cannabis’ with joints. Other possible causes that might explain Mary’s distinct experiences are the dosage used,

social setting, mental state and expectations of use. People may also declare that ‘medicinal cannabis’ does not cause a ‘high’ because of the stigma associated with psychotropic effects.

Other interviewees called cannabis ‘medicinal cannabis’ when it was “*cultivated for medicinal purposes*”. By this, they meant cannabis which was cultivated in safe conditions (i.e. free of contaminants) and of which the standardisation and quality were ensured (e.g. medical grade herbal cannabis available in pharmacies). Cannabis bought from untrustworthy sources of supply was considered medically unsafe.

### 2.3.3 Effects

Since participants believed that recreational users consumed higher doses and stronger cannabis products, medicinal and recreational use were also distinguished by experienced effects. Interviewees believed that recreational users experienced more (intense) psychoactive effects, while medical use was mostly characterised by therapeutic physical effects. For instance, several participants said that they were only ‘high’ when using for recreational purposes. **Sophie (37)**, suffering from fibromyalgia, thought that she did not experience the same effects as a recreational cannabis user, because “*the potency of her cannabis products was lower*”. According to Sophie, the CBD in her cannabis products tempers the THC, which prevents a cannabis ‘high’. She and other respondents thought that the overall experience between the two types of use was inherently different because of medicinal cannabis users’ poor(er) health.

During the interviews participants put forward particular motives for their use and the absence of other motives to proof that their cannabis use was medical and not recreational. For instance, **Luc (64)** argued that he used cannabis only right before he went to sleep as a preventive medicine, as a consequence he was not able to experience the psychoactive effects of cannabis. The impossibility of experiencing psychoactive effects, was for him the main proof that his use was not recreational. Many other participants stated that they did not use cannabis to get ‘high’ or ‘stoned’ when using for therapeutic purposes, to indicate that they were not using recreationally (Pedersen, 2015).

### 2.3.4 Setting

Interviewees used cannabis medicinally most of the time alone (cf. Roy-Byrne et al., 2015; Sznitman, 2017). Whereas medicinal cannabis use lacked a social component, recreational use was more often described a social activity, as it was used in group together with friends (e.g. festivals, youth club, etc.). Cannabis was used recreationally when one had time off and was free from responsibilities (e.g. weekends or holidays). As a result, several interviewees used higher amounts of cannabis during the

weekend. Interviewees used cannabis medicinally primarily at home, while they used cannabis recreationally in private as well as in public settings (e.g. outdoor).

When interviewees were asked if they used cannabis recreationally, they mostly referred to the contexts of social use in periods earlier in their life. Previously, cannabis was used to socialise, for instance by sharing a joint among friends. When interviewees spoke of their own current recreational cannabis use patterns it was not only in a social text, instead many said they used it to relax in the evening, similar to drinking a glass of wine. For instance, while watching TV, reading a book or walking in a park. Based on the findings of the current study, we cannot claim whether the social component of cannabis use became less important due to the fact that one became disabled or because of ageing.

### 2.3.5 Transition from recreational to medicinal cannabis use

Over half of the sample had experience with recreational cannabis use. Many of them reinterpreted their recreational cannabis use in a medical framework. The meaning of their cannabis use changed when they became ill or disabled. From the moment interviewees started using cannabis for health purposes they informed themselves about medicinal cannabis use. Not only did they redefine their cannabis use, the shifting in frameworks also implicated that they altered their use patterns, motives for use, setting of use and/or had different experiences. These differences were discussed in the sections above.

Interviewees who used cannabis when they were young, referred to this period when asked about the meaning of recreational cannabis use. According to these participants, this use differed from their current medicinal cannabis use regarding use patterns, setting and motives for use. Multiple participants who were former recreational cannabis users noted that their use frequency increased with the transition to medical use. Unnecessary sporadic use changed into necessary daily use. Next, seasoned cannabis users experienced different sensations or reinterpreted the effects of cannabis since using cannabis for health purposes. The intoxication effects of cannabis were experienced less intense and became less important. One possible explanation is that these effects diminished as a result of tolerance due to a higher frequency of use.

**David (39)** explained that his use patterns from the past as a recreational user were distinct from his current medical use patterns seven years later. Since he was using cannabis for severe digestive problems he craved less for cannabis and did no longer enjoy using it at social events like he used to do. At the time of the interviews he used cannabis mostly when sitting in the couch by himself:

*R: "Back in the days I could enjoy it, I smoked almost everywhere and I was still able to perform, I went to work. I wasn't bothered by it. But now I'm lightheaded and feel giddy."*

*I: "But are they the same effects that you experience, or not?"*

*R: "No, that is quite different, as I say in the past I felt relaxed, the feeling is..., it is actually difficult to describe when I think about it. Yeah, I used to be calm, relaxed and happy, and now it's just an uncomfortable feeling." [David/M/39]*

**Danny (55)** a lung cancer survivor, who used cannabis recreationally in the past, noted that his recreational cannabis use was “*completely different*” from his current medicinal cannabis use. Since he became ill, he did no longer experience being ‘stoned’ like he used to do, instead the only effect he experienced from cannabis was the relief of his cramps. Because he did not experience the -what he called- “*recreational effects*” no longer, he said it would be a waste to use it recreationally. **Armand (50)** who “*learned to use cannabis as a medicine for ADHD and Tourette syndrome*” stated that he did not feel ‘stoned’ like he used to, partially because he used lower amounts of cannabis. He spoke of being first a recreational cannabis user and slowly becoming a medicinal cannabis user. While the transit from a recreational to a medicinal cannabis identity appeared to happen spontaneously most of the time, Armand noted needing to learn using medically, similar to the learning process described by Athey et al. (2017) and Lankenau et al. (2018a).

*“If I would have had the chance to use cannabis as a medicine, then I had learned to use it as medication a long time ago. I mean, I really had to learn how to use cannabis. I’ve abused cannabis for a long time. Walking around high... I had to learn that cannabis also can help without having to use this much. Now, I notice that I have used cannabis, but I’m not high. No, no, far from it. I feel a bit calmer.”* [Armand /M/50]

Armand adjusted his use cannabis use patterns and reinterpreted the sensations induced by cannabis. His descriptions are in line with -and at the same time the opposite of- the process described by Becker on learning to enjoy the psychoactive sensations of cannabis. Conversely, **Vivian (53)**, a novice cannabis user, had to learn how to interpret and enjoy the intoxicating effects of cannabis (see Becker, 1953). She started using cannabis for pain issues, but by discovering the pleasurable sensations of it she used it now for recreational purposes as well.

*“I started using cannabis really as a medicine. But because the medicine has such pleasant side effects, I also use it recreationally now. In the beginning I was thinking “why do youth like this so much, it is not fun at all.” But by learning how to use it, I do like it now. So I keep using it in the weekends.”* [Vivian/F/53]

## 2.4 Discourse on medicinal and recreational cannabis use

Participants’ discourses give us more information about their views on recreational and medicinal cannabis use. When participants discussed the use patterns of other (recreational) cannabis users, more often they spoke of “*smoking*”, “*smoren*” and “*blowen*”<sup>39</sup> weed or joints, while participants themselves (i.e. medicinal cannabis users) “*use cannabis*”. Terms such as “*junkie*”, “*drug addict*” and “*addiction*” only came up in the context of recreational cannabis use. Participants used these descriptions for other groups of cannabis users from whom they distanced themselves. (Ex-) recreational cannabis users were more familiar with this ‘recreational cannabis discourse’ than non-recreational users. This discourse was loaded with terms from the recreational cannabis culture, such as the names of popular cannabis strains

<sup>39</sup> ‘*Blowen*’ and ‘*smoren*’ are Dutch slang terms for smoking (cannabis).

(e.g. haze and white widow), categorisations of the cannabis plant (e.g. sativa and indica) and cannabis products and ingestion methods typically associated with recreational cannabis use (e.g. smoking weed and joints).

In the interviews the more neutral word ‘cannabis’ was reported 2000 times, ‘weed’ 458 times, and ‘marijuana’ 124 times.<sup>40</sup> Interviewees mentioned the two most known cannabinoids CBD 548 times and THC 472 times. In 47 interviews these two cannabinoids both came up. These numbers are much higher compared to the times the categories cannabis sativa (n=97) and indica (n=86) were reported, terms frequently used in the recreational cannabis culture. It is possible that medicinal cannabis users avoid stigmatised terms that originate and are associated with recreational cannabis use, to gain acceptance for their medical use (Chapkis, 2007). This also illustrates their technical and medical terminology (Pedersen & Sandberg, 2013; Pedersen, 2015), which will be discussed in the next chapter.

## 2.5 Pleasure as a part of medicinal cannabis use?

It was clear that a significant number of interviewees were not reluctant to and enjoyed to use cannabis. However, this does not necessarily mean that those individuals who can enjoy using cannabis, experience ‘pleasure’ at any time. Because several interviewees made a distinction between their own recreational and medical use (patterns), it was clear that they did not necessarily enjoy the psychedelic effects when using cannabis as a ‘medicine’. Most of the time, enjoying the use of cannabis was explained in the context and setting of recreational cannabis use. Only, two participants said that cannabis relieved their pain and spasms, but also made them happy and relaxed simultaneously.

There were several participants who did not think of cannabis use in terms of enjoying or not. To them, using cannabis had no particular meaning and it was the same as taking other medicines.

*“It’s not that I’m jumping around and say “yay, I can go roll a joint.” No, that’s not the case. For me it’s really like taking Ritalin® every day.” [Sandra/F/42]*

Some interviewees noted experiencing pleasure because their symptoms were relieved due to the use of cannabis, but emphasized that this was not because of being intoxicated.

## 2.6 Cannabis, a drug?

An interesting finding was that while some of my participants thought of cannabis as a ‘drug’ (‘euphoriant’ or “*genotsmiddel*”<sup>41</sup>), others (firmly) disagreed with this opinion. This results from people having different frames of reference and conceptualisations of a ‘drug’. The first group acknowledged

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<sup>40</sup> These numbers also include the interviewer’s reports, who adjusted her terminology to the terminology of the interviewee.

<sup>41</sup> ‘*Genotsmiddelen*’ are foods, spices and intoxicants which provide delight or pleasure to the senses (Reinarman, 2007).



that cannabis is similar to other psychoactive substances (e.g. alcohol, medicines, illicit drugs, etc.) regarding its pleasuring effects, risks and/or potential of abuse. Many respondents thought that medicines in general were no different from ‘drugs’. For these respondents the psychoactive property was their common characteristic and was considered an essential attribute of a ‘drug’.

*“When I was younger I wanted to become an athlete. I wanted to have a clean and nice life. I wanted to colour inside the lines and be disciplined. Then I’m like, drugs... Cannabis is still a drug you know. But yeah medicines are also drugs. Let’s call a spade a spade.” [Rudy/M/55]*

Other respondents, argued that cannabis “*is also being used as a drug*”. As one respondent cites: “*There are still some people who don’t believe me that I use cannabis for medical purposes. They think that I use it as a drug.*” This narrative shows that not only the substance itself was considered as a criterion for being labelled as a ‘drug’, but also motives for use and the context in which it is used. These respondents acknowledged that cannabis is used recreationally and as a ‘euphoriant’, and therefore it was considered a drug. It appears that from the moment cannabis is used in a recreational context it turns into a drug. The fact that a large number of participants compared cannabis with alcohol, indicates that people view both substances in a similar matter.

Others stated explicitly that they did not think of cannabis as a ‘drug’ but they viewed it as a “*natural substance*”, “*herb*”, “*homeopathic*”, “*medicinal plant*” or “*medicine*” (cf. Järvinen & Demant, 2011). Rich CBD cannabis products, without psychoactive properties, were also not considered as ‘drugs’ and perceived differently than psychoactive cannabis products.

### 2.6.1 Cannabis versus other illicit drugs

Many respondents disliked and/or were opposed to other illicit psychoactive drugs and thought that they were incomparable with cannabis. Looking at interviewees’ discourses cannabis seemed to be distinct from most other drugs, in particular regarding harmfulness. Participants made this clear by labelling cannabis with the term ‘natural’ and other illicit drugs with terms such as ‘synthetic’, ‘chemical’ and/or ‘hard’ drugs. Whereas cannabis risks were regarded as limited, other illicit drugs were described as harmful (e.g. dependence, psychosis, digestive damage, etc.). This way, two intuitive distinct categories of substances were constructed through respondents’ narratives. Comparing the risks of different types of drugs can be symbolic boundary work when certain drugs are considered safer than other. Distancing oneself from the use or users of more stigmatised or ‘hard’ drugs is a common symbolic boundary strategy used by ‘soft’ drug users, such as cannabis users (Copes, 2016; Peretti-Watel, 2003), on which I will elaborate in chapter six.

### 3. Discussion

In line with previous studies, recreational cannabis use was common among self-labelled medicinal cannabis users (Swift et al., 2005; Boehnke et al., 2019). Almost eighty percent of my survey sample have ever used cannabis recreationally and half of the sample were using cannabis recreationally at the time of the study. This high number has to be interpreted in light of Belgian's historical and current legal context. Since medical cannabis products have never been legally available in Belgium, except for Sativex®, it is likely a smaller step for recreational cannabis users who are already experienced to start using it for health purposes than for non-users. It is also possible that they redefined and reinterpreted their recreational use as medical (Lankenau et al., 2018a). My findings suggest that most participants were first using cannabis recreationally prior to their medicinal use, and not the other way around (Reinarman et al., 2011). Eight percent of the participants who had ever used cannabis recreationally claims not having used for recreational purposes prior to their medicinal use. An interesting question for future research might be whether people who use cannabis for medicinal purposes also start to use it for non-medical motives.

Self-identified medicinal cannabis users had positive attitudes towards recreational cannabis use. I found significant differences between the three subgroups regarding their views on recreational and medicinal cannabis use. Exclusively medical users were less likely to agree with the statements that 'in certain contexts recreational cannabis use can be considered as medical' and that 'the two types of use are difficult to distinguish' than current recreational cannabis users. This might indicate that people using cannabis for recreational purposes have a broader understanding of the concept of medicinal cannabis use and use a broad definition of legitimate medicinal cannabis use. The interview findings show that interviewees had very different conceptualisations of 'medicinal' and 'recreational cannabis use'. Some interviewees were uncertain about the meaning of the two concepts. For instance a couple of participants were unsure if they were eligible to participate in the study because they '*did not use medical cannabis*'. They meant that they did not use the cannabis products sold at pharmacies, but they did use cannabis to alleviate health problems.

The discourse analyses reveal that self-described medicinal cannabis users used a medical and technical terminology (e.g. "medicine", "treatment", "cannabinoids") to describe their treatments with cannabis and are less likely to use a discourse typically for recreational cannabis use (Pedersen & Sandberg, 2013; Athey et al., 2017; Pedersen, 2015; Lankenau et al., 2018a). This chapter shows that medicinal cannabis users themselves identified several dissimilarities between recreational and medicinal cannabis use. The motive for use was the most important determinant whether cannabis use was defined as medical or not. Medicinal cannabis use was mainly described by the improvement of physical health conditions. Other points of difference which distinguished medical use from recreational use, included use patterns (dose, frequency of use, administration method and cannabis product), (social) setting of use and experienced effects. Consistent with previous research findings, this study suggests that people use cannabis for medicinal purposes on a more frequent basis than using recreationally (Sznitman, 2017; Lin et al., 2016;

Pacula et al., 2016; Roy-Byrne et al., 2015; Goulet-Stock et al., 2017). Regarding frequency of use, medicinal cannabis use resembles the use of other medications which are also mainly taken on a daily basis. The interview findings show that recreational cannabis use happens sporadically during leisure time.

There were about as many survey participants who used the same dosage of cannabis whether using for recreational or for medicinal purposes, as participants who utilised a higher or lower dose. Thus, the dose when using recreationally is not always higher than when using medicinally. Some respondents even reported a lower dose. In contrast, my interviewees thought that recreational users generally use a higher dose of cannabis to intensify the psychoactive effects. The survey results show that this is not always the case. It is possible that people switch between cannabis products when using for different purposes, and adjust the dose to the cannabinoid content. In the end the total amounts of cannabis used by a medicinal cannabis user is probably higher than the amounts consumed by recreational cannabis users, due to their higher frequency of use. These findings are based on retrospective self-reports, more detailed observational research and data source triangulation are necessary to produce more detailed and accurate data on this particular matter.

Other scholars argue that medical cannabis users may share motives for cannabis use with recreational cannabis users (Bohnert et al., 2018; Athey et al., 2017; Lankenau et al., 2018). While the relief of symptoms was the main reason to use cannabis among my participants, I found that self-identified medicinal cannabis users also reported motives for using cannabis that can be considered 'non-medical'. Participants who currently use cannabis recreationally alongside their medical use were unsurprisingly most likely to report non-medical motives. However, participants who claimed only having used cannabis recreationally in the past and respondents who have never used cannabis recreationally also reported non-medical motives for using cannabis. Some interviewees believed that there was a grey zone between recreational and medicinal cannabis use and reported reasons which they did not consider medical nor recreational use (e.g. using cannabis to relax or as a preventive medicine). The findings in this chapter indicate that motives for recreational and medicinal cannabis use can be intertwined and are context dependent. The interview results suggest that whereas a proportion of the self-identified medicinal cannabis users use cannabis intentionally as a multipurpose therapeutic agent, others did not. However, many times these latter also experienced multiple therapeutic effects going beyond the relief of one particular symptom.

The findings presented in this chapter suggest that pleasurable sensations derived from cannabis use depend on the context, which is in line with the tenets of sociological theories of drug experiences. In pharmacological approaches the chemical properties of drugs define the experiences of the user, regardless of the context (Holt & Treloar, 2008). The medical literature is for the most part silent on the therapeutic benefits of the pleasurable sensations induced by certain psychoactive medicines. Euphoric and mood altering effects yielded by medical drug use (e.g. opioid use) are considered a risk factor for dependence and non-medical use of prescription drugs. Similar to discourses in policy debates on illicit

drug use (Holt & Treloa, 2008; Dwyer, 2008), the topics pleasure or psychoactive enhancements are nearly absent in discourses on medical drug use.

If cannabis were to become legally available as a conventional medicine in the future in Belgium, the samples of self-identified medicinal cannabis users of future studies might look different. They might have different experiences and attitudes towards using cannabis for health purposes. If cannabis would be integrated as a standard treatment, it is possible that there will be less overlap between recreational and medicinal cannabis use. It is therefore useful to compare the findings of the present study with similar future studies and studies conducted in countries where cannabis is legally and culturally accepted as a medicine with regards to medicinal cannabis users' experiences with and attitudes towards using cannabis as a medicine and for other purposes.

## Chapter 5

### Conventional and alternative medicine

#### *Introduction*

In this chapter I explore self-identified medicinal cannabis users' experiences with and attitudes towards conventional and alternative health care. The first subsections of the survey and interview results present participants' experiences with standard (see 1.1 and 2.1) and alternative therapies (see 2.1). Particular attention is paid to participants' former and current use of traditional and alternative treatments. The sections identify the reasons why self-identified medicinal cannabis users prefer to use cannabis above conventional treatments, with particular attention to efficacy and adverse effects. These sections also intend to identify the motives of medicinal cannabis users for using conventional medicinal concurrently with cannabis.

The second subsections analyse the perceived role of participants' physicians with regards to medical cannabis use (see 1.2 and 2.2). These sections start with discussing self-identified medicinal cannabis users' decisions whether or not to inform healthcare professionals about their use. The section then continues by outlining to which degree medicinal cannabis treatments are accepted and supervised by health care professionals. Physicians are patients' primary contact point for the access to medications, including controlled substances such as cannabis. Since Belgian physicians are able to prescribe cannabis products due to therapy freedom (FAGG, 2017), attention is paid to self-identified medicinal cannabis users' requests for prescriptions for medicinal cannabis. The final subsection of the interview results finishes with exploring self-identified medicinal cannabis users' expertise about medicinal cannabis use and their most important information sources on medicinal cannabis use (see 2.3).

## 1. Results of the survey

### 1.1 Conventional medicines

To measure concurrent medication use, participants were asked if they used conventional medicines concurrently with cannabis on a regular basis. I asked the respondents who gave a positive response if those medications were used for the same health purposes as for which they used cannabis. There were about as many participants who currently use conventional medicines regularly (n=171; 50.4%), as participants who did not (n=168; 49.6%). Of the participants who currently use conventional medicines on a regular basis, 75.8% use at least one of these for the same purposes as for which they use cannabis (n=125) (see **table 42**).

**TABLE 42: SURVEY PARTICIPANTS' USE OF CONVENTIONAL MEDICINES**

<b>Regular use of conventional medicines (n=339)*</b>	<b>N</b>	<b>%</b>
Yes	171	50.4
No	168	49.6
<b>Use of medicines for the same purposes as cannabis (n=165)**</b>		
Yes	125	75.8
No	40	24.2

\*N=339, because 40 participants did not answer these questions because they did not complete the survey entirely, and because one participant selected 'I don't know' and one participant selected 'does not apply'.

\*\* N=165, because this question was only shown to participants who indicated in a previous question using conventional medicines on a regular basis (n= 171). Six participants selected 'I don't know'

I assessed participants' motives for using those conventional medicines. The most important reasons for using medicines for the same purposes as cannabis were because physicians instruct it (n=79; 66.4%) and because medicines are legal (n=74; 62.2%). About forty percent indicated that they take medicines because their accessibility is greater (n=50), that using only cannabis is insufficient for their conditions (n=49), and because regular medicines are cheaper than cannabis (n=47). Over thirty percent reported using conventional medicines because they are socially accepted (n=39) (see **table 43**).

**TABLE 43: SURVEY PARTICIPANTS' MOTIVES FOR USING CONVENTIONAL MEDICINES FOR THE SAME PURPOSES AS CANNABIS (N= 125)\***

	<b>N</b>	<b>%</b>
Instructed by a physician	79	66.4
Medicines are legal	74	62.2
Medicines are more accessible	50	42.0
Using only cannabis is insufficient for my complaints	49	41.2
Medicines are cheaper than cannabis	47	39.5
Medicines are socially accepted	39	32.8
Medicines and cannabis strengthen each other's effects	27	22.7
Medicines are easier to use than cannabis	12	10.1
Out of habit	9	7.6

\*N=125, because this question was only shown to participants who indicated in a previous question using conventional medicines for the same purposes as cannabis (n=125). Totals exceed 100% because multiple responses could be selected.

Participants were asked to compare efficacy and adverse effects between cannabis and medicines used for the same purposes as cannabis. Almost eighty percent of the sample thought that cannabis was more effective (n=256) than conventional medicines. A similar proportion believed that cannabis caused less adverse effects (n=269) than medicines used for the same health purposes. About four percent thought that medicines are more effective than cannabis (n=14), and about one percent rated the adverse events of cannabis worse than other medicines (n=4) (see **table 44**).

I examined whether participants who were using cannabis currently for recreational purposes answered differently on previous questions than participants who used cannabis recreationally in the past and participants with no recreational experiences, but no significant differences between the three subgroups were found.

**TABLE 44: SURVEY PARTICIPANTS’ PERCEIVED EFFICACY AND ADVERSE EFFECTS OF CONVENTIONAL MEDICINES AND CANNABIS**

<b>Efficacy of medicines compared to cannabis (n=324)*</b>	<b>N</b>	<b>%</b>
Medicines are a lot more effective than cannabis	6	1.9
Medicines are somewhat more effective than cannabis	8	2.5
Medicines and cannabis are equally effective	22	6.8
Cannabis is somewhat more effective than medicines	40	12.3
Cannabis is a lot more effective than medicines	146	45.1
Only cannabis is effective	70	21.6
I don’t know	32	9.9

<b>Adverse effects of medicines compared to cannabis (n=334)**</b>	<b>N</b>	<b>%</b>
Cannabis’ adverse effects are a lot worse than those of medicines	1	0.3
Cannabis’ adverse effects are somewhat worse than those of medicines	3	0.9
The adverse effects are about the same	9	2.7
Medicines’ adverse effects are somewhat worse than those of cannabis	24	7.2
Medicines’ adverse effects are a lot worse than those of cannabis	242	72.5
Neither cannabis, nor medicines have adverse effects	37	11.1
I don’t know	18	5.4

\*N=324, because 40 participants did not answer these questions because they did not complete the survey entirely and because 17 participants selected ‘other’.

\*\* N=334, because 40 participants did not answer these questions because they did not complete the survey entirely and because seven participants selected ‘other’.

## 1.2 (The lack of) medical supervision

The following set of questions were designed to assess the role of physicians with regards to their patients’ medicinal cannabis use. The first question asked if participants had a general practitioner. Participants who said they did, were asked if they informed this physician about their cannabis use.

The majority of the survey respondents who had a regular general practitioner informed this physician about their cannabis use (n=208; 65.2%). Over twenty percent indicated that their general practitioner was not informed (n= 83; 26.0%) (see **table 45**).

**TABLE 45: GENERAL PRACTITIONERS INFORMED ABOUT SURVEY PARTICIPANTS' CANNABIS USE**

<b>Respondent has a general practitioner (n=345)*</b>	<b>N</b>	<b>%</b>
Yes	319	92.5
No	26	7.5
<b>General practitioner is informed about cannabis use (n=319)**</b>		
Yes	208	65.2
No	83	26.0
I don't know	28	8.8

\* N=345, because 36 participants did not answer these questions because they did not complete the survey entirely.

\*\* N=319, because this question was only shown to participants who indicated in a previous question having a general practitioner (n=319).

Respondents who did not inform their general practitioners were asked to select reasons from a predetermined list for not informing their general practitioners. Citing multiple answers was possible (see **table 46**). The most important reasons for survey respondents not to inform their general practitioners were physicians' lack of knowledge on cannabis (n=34; 41%) and the illegal status of cannabis (n=34; 41%). About a quarter of the respondents who did not discuss it with their family doctor thought that this was unnecessary (n=23; 27.7%); that their general practitioner would respond negatively (n=21; 25.3%); or that they feared that their relationship with their doctor would be jeopardised (n=21; 25.3%) (see **table 46**).

**TABLE 46: SURVEY PARTICIPANTS' REASONS FOR NOT INFORMING THEIR GENERAL PRACTITIONER ABOUT THEIR CANNABIS USE (N=83)\***

	<b>N</b>	<b>%</b>
Lack of knowledge on cannabis	34	41.0
Illegal status of cannabis	34	41.0
Unnecessary for general practitioner to be informed	23	27.7
General practitioner will respond negatively	21	25.3
Fear that relationship will be jeopardised	21	25.3
Lack of interest in cannabis	19	22.9
Never considered discussing it	16	19.3
Not knowing physician well enough	14	16.9
Physician never asked it	11	13.3
Previous negative experiences with physicians	7	8.4

\*N=83, because this question was only shown to participants who said their general practitioner was not informed about their cannabis use. Totals exceed 100% because multiple responses could be selected.

The following survey question focussed in on prescriptions for medical grade cannabis products. With a forced choice question format, participants were asked if they had ever requested their physicians to prescribe cannabis and whether or not physicians agreed to do so. A majority of the sample had never asked a physician for a medical prescription for cannabis (n= 242; 71.8%). One in ten have asked one physician for a prescription but this physician refused (n=37), and less than four percent said they asked multiple physicians to prescribe cannabis but they all refused (n=12). Less than four percent stated they needed to consult more than one physician to get a prescription (n=12). Finally, ten percent had a prescription for which they only needed to consult one physician (n=34) (see **table 47**).



**TABLE 47: PRESCRIPTIONS FOR MEDICAL GRADE CANNABIS (N=337)\***

	N	%
I never asked a physician for a prescription	242	71.8
I asked one physician for a prescription, but he or she refused	37	11.0
I have a prescription for which I only had to consult one physician	34	10.1
I have a prescription, but I needed to consult more than one physician, because some of them refused to prescribe	12	3.6
I asked more than one physician to prescribe cannabis, but they all refused	12	3.6

\* N=337, because 40 participants did not answer these questions because they did not complete the survey entirely, and because four participants selected the option 'other'.

The following questions assessed perceived medical support and supervision. Participants had to indicate on agreement Likert scales whether or not they agreed with statements about general practitioners' attitudes towards their cannabis use (see **table 48**), and about medical supervision on medicinal cannabis use (see **table 49**).

**TABLE 48: GENERAL PRACTITIONERS' SUPPORT WITH REGARDS TO MEDICAL CANNABIS USE (N=208)\***

	Disagree		Neither agree, nor disagree		Agree	
	N	%	N	%	N	%
My general practitioner is understanding	15	7.2	47	22.6	146	70.2
My general practitioner disapproves of my cannabis use	131	63.0	57	27.4	20	9.6
Informing my general practitioner about my cannabis use jeopardised our relationship	174	83.7	26	12.5	8	3.8
My general practitioner believes in the therapeutic potential of cannabis	26	12.5	90	43.3	92	44.2
Initially, my general practitioner advised me to use cannabis	167	80.3	27	13.0	14	6.7

\*N=208, because the statements were only shown to participants who indicated that their general practitioners were informed about their use.

Among the participants who informed their general practitioner about their use, most respondents indicated that they were supportive of their medicinal cannabis use. Thirty percent of the sample did not agree with the statement that their general practitioners are understanding of their medicinal cannabis use (n=62). Less than half of the sample agreed with the statement that their general practitioners believe in the therapeutic potential of cannabis (n=92; 44.2%). About seven percent stated that their general practitioners advised them to use cannabis at first (n=14) (see **table 48**). A significant majority reported not receiving medical instructions from a physician regarding their medicinal use (n=259; 75.5%) and indicated that they are not properly supervised by a physician (n=250; 72.9%) (see **table 49**).

**TABLE 49: MEDICAL SUPERVISION WITH REGARDS TO MEDICINAL CANNABIS USE (N=343)\***

	Disagree		Neither agree, nor disagree		Agree	
	N	%	N	%	N	%
I receive medical instructions from a physician regarding my use	259	75.5	42	12.2	42	12.2
I am properly supervised by a physician regarding my use	250	72.9	54	15.7	39	11.4

\*N=343, because 38 participants did not answer these questions because they did not complete the survey entirely.

I compared the three subgroups with regards to medical support and supervision. Exclusively medicinal cannabis users were more likely to agree with the statements that ‘their general practitioners are understanding of their medicinal cannabis use’ and that ‘they believe in the therapeutic potential of cannabis’, compared to current recreational cannabis users. Exclusively medicinal cannabis users agreed more with the statements that ‘they receive medical instructions from a physician’ and ‘they are properly supervised by a physician’, than former and current recreational cannabis users (see **table 50**).

**TABLE 50: MEDICAL SUPPORT AND SUPERVISION (COMPARISONS BETWEEN THE THREE SUBGROUPS)**

	Exclusive medical		Previous recreational		Current recreational	
	N	%	N	%	N	%
<b>Medical support</b>	<b>N=46</b>		<b>N=53</b>		<b>N=105</b>	
<b>My general practitioner is understanding</b>						
Disagree/neutral	7	15.2 <sup>a</sup>	16	30.2	37	35.2 <sup>a</sup>
Agree	39	84.8	37	69.8	68	64.8
<b>My general practitioner disapproves of my cannabis use</b>						
Disagree/neutral	44	95.7	49	92.5	91	86.7
Agree	2	4.3	4	7.5	14	13.3
<b>Informing my general practitioner jeopardised our relationship</b>						
Disagree/neutral	45	97.8	53	100.0	99	94.3
Agree	1	2.2	0	0.0	6	5.7
<b>My general practitioner believes in the therapeutic potential of cannabis</b>						
Disagree/neutral	19	41.3 <sup>a</sup>	26	49.1	68	64.8 <sup>a</sup>
Agree	27	58.7	27	50.9	37	35.2
<b>Initially, my general practitioner advised me to use cannabis</b>						
Disagree/neutral	42	91.3	50	94.3	98	93.3
Agree	4	8.7	3	5.7	7	6.7
<b>Medical supervision</b>	<b>N=76</b>		<b>N=86</b>		<b>N=172</b>	
<b>I receive medical instructions from a physician regarding my use</b>						
Disagree/neutral	57	75.0 <sup>a,b</sup>	79	91.9 <sup>a</sup>	158	91.9 <sup>b</sup>
Agree	19	25.0	7	8.1	14	8.1
<b>I am properly supervised by a physician regarding my use</b>						
Disagree/neutral	57	75.0 <sup>a,b</sup>	80	93.0 <sup>a</sup>	160	93.0 <sup>b</sup>
Agree	19	25.0	6	7.0	12	7.0

<sup>a,b</sup> groups with the same superscript differ significantly from each other at a significance level of  $p \leq 0.017$ , tested using Chi<sup>2</sup> test.

## 2. Results from the face-to-face interviews

### 2.1 Health care

#### 2.1.1 Standard treatments

Many of the interviewees used a range of conventional medicines and underwent other treatments from conventional medicine for their conditions, alongside cannabis, including: surgery, chemotherapy, painkillers, stimulant medication, antidepressants, anti-inflammatory drugs, anti-diarrhoeal drugs, antiemetics, immunotherapy, hypnotics, muscle relaxants, antipsychotics, etc. Since most respondents used cannabis as a treatment for pain, analgesics were the most frequently used type of medication among the interview sample. The use of strong pain medication, such as oxycodone, morphine, tramadol, codeine, ketamine and fentanyl, were no exception. A significant number of respondents reported that at some point in time they were taking more than ten different prescription pills a day. All of them believed this would not be without health risks. More often, interviewees had to increase the dose of their standard medicines so that they would remain effective, or they had to switch to stronger medicines when a less strong treatment was no longer effective.

*“Back in the days, when I was lying in the hospital and had to take medicines I was groggy the entire day and now they’re like candy. It’s the same for all this chemical shit. You get so much habituation that you’ll have to take many of them in the long run. I don’t have to take paracetamol, because it doesn’t work anymore. Soon, it will be the case that tramadol doesn’t work anymore, and then I have to start with things such as morphine patches. I really don’t want that.” [Maarten/M/37]*

Participants thought it was absurd they were taking medicines for the side effects of others (e.g. Proton-pump inhibitor for stomach problems caused by other medications), which was many times a vicious circle. Some participants claimed it was preposterous they had to take certain medicines (e.g. antidepressants, anti-epileptic drugs, antipsychotics, etc.) that were designed for particular conditions other than theirs.

A number of interviewees decided to quit taking certain prescription drugs or not to undergo particular standard treatments, because of their health risks and harms. **Thomas (35)** decided not to undergo back surgery for his chronic pain because of the risks associated with the operation. He was trying to postpone the operation as long as possible by using cannabis oil. At the time of the interviews, two MS patients were no longer using conventional treatments that stabilised the disease, because of the lack of improvement and because of severe adverse effects. Many participants refused to switch to stronger pain medication (e.g. morphine pump) although their current pain medication was insufficient. Participants tried to avoid taking strong analgesics by substituting them with cannabis.

*“You have three steps in pain medication. I’m now being treated at level two, but I don’t want to go to step three. Fentanyl patches, that is step three. When I look up ‘living with*

*morphine' on the internet I end up at 'terminal sedation'. So what is morphine? A pain reliever or a suicide or euthanasia substance?" [Rudy/M/55]*

Many respondents noted that they were able to reduce their standard medicines (e.g. analgesics) because of cannabis. The ability to take fewer conventional medicines was considered a highly important benefit of using cannabis therapeutically (cf. Piper et al., 2017). While a few participants were no longer using any conventional medicine for the same purposes for which they used cannabis, others did. The main reason for taking conventional medicines alongside cannabis was because cannabis alone was insufficient as a treatment. For instance, some respondents still used analgesics in addition to cannabis in order to be able to control their pain. Most of the time strong painkillers were necessary when pain was severe and could not be controlled by cannabis solely. Other participants switched between cannabis and other medications to avoid developing tolerance. This way, they assumed that both would remain effective in the long run. Other reasons for continuing with conventional medicines varied. For instance, **Kim (31)** still used baclofen (a muscle relaxant and antispastic) for muscle spasms, because she did not want to smoke cannabis the entire day. Similarly, other participants relied on conventional medicines to avoid using cannabis all day. Another important reason why people were using conventional medications was because they were used for health problems other than the ones treated with cannabis.

### 2.1.2 Experiences with and attitudes towards conventional medicine

The majority of this interview sample had at least one negative experience with conventional medicine. This includes first of all the side effects and adverse events caused by prescription drugs and other conventional treatments. Next, several participants spoke of the lack of necessary treatments and receiving wrong or no diagnoses. A number of participants stated that they underwent treatments that turned out to worsen their health. Some of them were using cannabis because of adverse events or iatrogenesis (e.g. complications following a surgical procedure). A few interviewees had been in conflict with their physicians for diverse reasons. Most of the time, there was a disagreement between the patient and the doctor concerning the chosen treatments.

*"There is a square on my thigh bone that is really painful. At times it feels as if they put thousands needles in it. It's impossible to live this way. My physicians said that I had to wait until it's over. How is that possible?! What kind of explanation is this from two stomatologists. One is an oncologist specialised in face oncology, the other one is a stomatologic surgeon, and I have to wait until it is over?! That's no explanation."*  
[Liesbeth/F/56]

**Nicole (45)** reported one of the most traumatic experiences:

*"One reason why I have problems with doctors is that I was complaining about constant headaches from the age of 16. They were never able to find something and they've thrown me in psychiatry. As a result, you get antidepressants with adverse effects, suicide attempts and depression. In 2012, right before my mother died I went back to the hospital, because my psychiatrist recommended it. I told him "you have to refer me to another*

*physician because something is wrong". I said "if you don't help me, if you don't give me a light in the dark, then I'll leave here and drive into a tree, the first one that I'll pass." So he referred me to a neurologist, and this physician said "Madam isn't it possible that your head aches come from the brain tumour we discovered in 2008?" They never told me that I had a brain tumour, because I never got to go to a neurosurgeon. After the surgical operation in my brain, my psychiatrist said that all the medication, lithium therapy and electroshocks had not been necessary, because the headaches were caused by the brain tumour." [Nicole/F/45]*

Some participants stated that their diseases were not taken seriously by medical practitioners. **Sophie (37)** and **Rosa (63)**, both suffering from fibromyalgia, met physicians who contested the condition. Rosa stated that physicians were always searching for other causes of her symptoms, and Sophie said physicians did not search for a diagnosis when she believed her pain was not caused by fibromyalgia. **Wendy (33)** suffering from spasmophilia and **Willy (70)** living with multiple chemical sensitivity (MCS), stated that their diseases were not recognised.

Multiple respondents were convinced that conventional medicines were too easily accessible. According to these participants, physicians were too quick to prescribe medicines, "*as if they are candy*". A number of interviewees felt like a guinea pig on which physicians experimented with all kinds of unhealthy medication and treatments. They expressed frustration when noting that they were tired of taking tons of pills, testing new treatments and undergoing medical examinations, which was seen as guesswork. At the same time, participants believed they were insufficiently informed about the treatments they underwent.

*"When I was hospitalised, they were experimenting with all different kind of things. At a certain point I was taking 430 pills per month. I had to take five pills before and after dinner of a particular medicine. And vitamins for this, other vitamins for that...[Sighs], it was too much. Then I was like "Nobody will say that this is healthy in the long run". In the end there was also no improvement. Eventually, they found out that my stomach didn't absorb anything..." [David/M/39]*

Support for conventional medicine varied among my interviewees. A group of participants were satisfied with conventional medicine overall. As **Helena (60)**, suffering from cancer, noted "*I had ten years of extra chances. Also because of those chemical substances.*" Other respondents thought that conventional medicine was essential and physicians were doing a good job (e.g. surgery, antibiotics, etc.), but they did not agree with all of their practices. Another group of participants already thought very negatively about conventional medicine, and others changed their views due to their experiences with medicinal cannabis. Mostly, these negative views were based on participants' own experiences with conventional treatments. They became distrustful in conventional medicine and decided to be cautious in taking medicines (e.g. vaccinations) and undergoing particular treatments (e.g. surgery). **Anny (58)** expressed profound indignation about the fact that financial interests were put above patients' health:

*"I have had cervical cancer two times. Only once in three years does my pap test get reimbursed. Say what?! It's really necessary I get a check-up every year." [Anny/F/58]*

More often, the pharmaceutical industry was distrusted and heavily criticised. Multiple respondents thought that this industry, and parts of conventional medicine, were a commercial business only interested in making profit (n=18) (cf. Pedersen, 2015). The quality of care they offered was believed to be inferior (e.g. “big money”, “pharma mafia”, “clients instead of patients”, etc.). According to some, the ‘industry’ was the reason that herbal cannabis was not allowed, because it cannot be patented as a medicine and because pharmaceutical companies block it for their own financial interests. Cannabis was viewed as a threat for the pharmaceutical market. Participants were convinced that if pharmaceutical companies would start investing in cannabis this would only be out of financial considerations. Two respondents feared that when pharmaceutical companies would take over the cannabis market, cannabis would become less accessible. In this context, respondents referred commonly to the fact that people can be helped in a cheap way by using herbal cannabis. Many interviewees in this study used the following expression: “*you put it in the ground and it grows*” (Pedersen, 2015). Leo provides an illustrative example:

*“Millions are now being invested in research on cannabis and what will be the consequence? I fear that it will be all distributed via atomisers and pills, then suddenly it will no longer be possible to be harmful...”* [Leo/M/54]

With irony, Leo suggests how synthesised medicines ingested with medical administration methods are considered safer in our society.

### 2.1.3 Alternative treatments

Several respondents believed that alternative medicine provided beneficial treatments. Three respondents were convinced that alternative and conventional medicine should exchange more expertise and knowledge than is happening right now.

Many alternative therapies were tried out for the same purposes for which cannabis was used, but also for other health purposes, including acupuncture, herbal medicine, osteopathy, homeopathy, natural nutrients, psychoactive illicit drugs, movement exercises, hydrotherapy, meditation, mindfulness, etc. A few participants tried alternative remedies that were not recognised as medical treatments in Belgium. In order to obtain these therapies they had to travel abroad or they were ordered online (e.g. kratom, stem cell products, Daxas®, food grade hydrogen peroxide, etc.). Those who used these treatments were mostly patients who were not helped by or dissatisfied with the many conventional treatments they tried. A subset of interviewees had changed their diet for health purposes (e.g. organic, vegetarian, vegan, sugar free diet, etc.). More often, individuals had no other choice due to their medical conditions. Staying active and exercising was also considered important for one’s health.

Respondents reported successful results from alternative treatments, but also many unsuccessful outcomes. In addition, alternative therapies were many times more expensive than conventional

treatments, because of the lack of reimbursement. As a result, alternative treatments were most of the time not a sustainable solution. Although alternative remedies were tried out frequently by medicinal cannabis users, they were not persuaded overall.

#### 2.1.4 Cannabis versus conventional medicines

During the interviews cannabis was many times compared with conventional treatments with regards to efficacy and safety. A significant number of respondents were clearly opposed to conventional pharmaceuticals.

*“I heard someone saying “I do prescribe cannabis, but it is the last option.” This makes me shiver. This is like, first shooting with a cannon, for instance chemotherapy, and only later applying something healthy. It has to be the other way around. The first option is cannabis and when necessary you can still take stronger substances.” [Vivian/F/53]*

Many times, cannabis was described as “herbal” or “natural” and therefore considered healthier and less harmful than “chemical” medicines producing “toxic” effects (Pedersen & Sandberg, 2013; Pedersen, 2015; Dahl & Frank, 2011). Respondents utilised various symbolic boundaries to make this difference clear (see **table 51** below).

**TABLE 51:** INTERVIEWEES’ DESCRIPTIONS OF CANNABIS AND CONVENTIONAL MEDICINES

Cannabis	Conventional medicines
Herbal (plant)	Chemical (pharmaceutical)
Natural	Synthetic/artificial
Good (true remedy)	Bad (junk, filth, rubbish)
Harmless/safe	Dangerous/toxic (poison)

Overall, phytoproducts stood for safety while synthetic substances were equated with harms and risks. The preference for herbal treatments was obvious from the fact that many participants looked for other herbal remedies as alternatives for their conventional medicines. **Rudy**’s comments exemplify what was commonly expressed by my interviewees:

*“Cannabis is natural, isn’t it? I’m natural, I’m an animal, no? I’m a primate and not a piece of plastic or a robot. So I’m rather helped by scientifically proven herbal products. Biomedicines... if I can put it that way.” [Rudy/M/55]*

This constructed opposition of natural versus chemical, was also clear in the comparisons of cannabis with illicit ‘chemical’ ‘hard’ drugs, which was discussed more in depth in the previous chapter.

However, not all participants were opposed to pharmaceuticals, since a number of respondents were relying on conventional medicines alongside cannabis. Most of the time they were even indispensable. Several respondents stated they would switch to prescription drugs if these were more or equally

effective as cannabis, without causing side effects. Reasons why participants preferred to switch to conventional medicines were diverse, including the psychoactive effects of cannabis, the lack of reimbursement, the illegal status of cannabis, having to smoke cannabis, practical reasons, etc. For other participants, pharmaceutical medicines were out of the question.

Multiple interviewees were aware of the existence of pharmaceutical cannabinoid medicines (e.g. Sativex®). Some of them were opposed to processed cannabis-based products. One of the commonly reported reasons was the fact that it was better to use the entire (herbal) plant and not to extract certain compounds. According to my respondents, using the plant with all its compounds was necessary for the entourage or synergetic effects. These participants were mainly people who can be called lay-experts on medicinal cannabis use, (former) recreational users and/or activists. Other interviewees, in contrast, were in favour of taking medicines based on extracts from cannabis. They noted that when the pharmaceutical industry would further examine cannabis and conduct clinical trials, there would be more medical supervision and clarity on efficacy and safety, which is currently lacking.

#### *2.1.4.1 Efficacy versus safety: balancing benefits and risks*

The two most important motives for people to switch from conventional treatments to cannabis were related to efficacy and side effects. Cannabis was perceived to be more effective or only effective for certain symptoms compared to other treatments (e.g. (stomach) cramps, pain, inflammations, spasms, CINV, etc.). Some respondents noted that cannabis worked differently than conventional medicines, especially regarding the duration of effects. **Danny (55)**, a former cancer patient, explained that when he smoked joints his pain was almost instantly relieved, while with regular medication it took one to two hours before it started working. **Anthony (50)**, suffering from MS, explained that painkillers relieve pain for only a short period after consumption and were ineffective in the longer term. Unlike painkillers, he still experienced positive effects from cannabis the day after smoking it in the evening.

When trying out cannabis for the first time, interviewees were most of the time searching for alternatives for their usual treatments because of their unbearable side effects and health risks. Almost the entire sample had experiences with adverse effects caused by conventional medications. Multiple interviewees compared the side effects caused by cannabis with adverse events of conventional medicines, which were considered much worse.

*“I’d rather fall asleep laughing a bit and relaxed than be sucked unconscious in a sleep. If you take Xanax® then you are KO. When you take only half a pill and you don’t make sure you’re in bed, you just fall down the stairs. I find that really creepy. You no longer know what is happening around you. You’re really in a coma.” [Marie/F/43]*

*“You are in the hands of conventional medicine. You don’t have any alternative than taking those filthy medicines. My stomach was wrecked and I was extremely depressed.” [Anny/F/58]*



Multiple participants noted that efficacious medicines were available for their conditions (e.g. painkillers, sleeping pills, etc.). At times, these were even more effective than cannabis, however their side effects meant that they were not worth taking. For example, **Nicole (45)** told us that her strong pain medication was effective for chronic pain. However, because she was suffering from COPD as well, the painkillers affected her breathing, leading her to choke. Overall, respondents believed that certain conventional medicines they were advised to take were toxic, unhealthy, dangerous, (extremely) addictive and/or damaged their body in the longer term.

*“My doctor prescribed quinine. This is a very strong substance. When nothing else works they will give quinine. I have been looking it up and when you take it a lot you can become blind. I was like “oh no”. And before my operation, I had to take benzodiazepines for a while. It did help, it was very effective for spasms, but you are very drowsy the entire day. It is actually a tranquiliser with muscle relaxation as a side effect. But I only needed the muscle relaxation, not the tranquilising part.” [Kim/F/31]*

Multiple participants compared their health with that of other patients’ who took “*harmful pharmaceutical medicines*”, to illustrate the irreversible damage caused by these medications, and how this was different from cannabis.

*“I want to do things in my life, I want to have quality. Not like a wreck shuffling around, broken from pain and insane from morphine. I know a lot of these people. I know many people who have the same disease as I have, ankylosing spondylitis, who are a hell of a lot worse than I am. Then I think “long live marijuana”, that’s the truth.” [Anny/F/58]*

Self-identified medicinal cannabis users reported various physical and mental adverse effects caused by conventional medicines, including: gastrointestinal and stomach problems, tiredness, suicidal thoughts, depression, sinusitis, hypersomnia, incontinence, food intolerance, increase of blood pressure, drowsiness, numbness, putting on weight, flu symptoms, cardiac arrhythmias, allergic reactions, kidney failure, impotence, common cold, etc. A number of participants stated that medicines affected them strongly in general and were destructive. The disadvantages of taking those medications outweighed their advantages.

*“I had to try a lot of medicines for my MS, but with the result that my gallbladder had to be removed. I can't break off medication, which makes me very sick. One time I forgot to take a pill. It was like going cold turkey. I had severe withdrawal symptoms, including pain everywhere, sweating,... This was only a few hours after forgetting one pill. Because of other medicines, I had been unable to keep any fluid down for five days. Everything that came out looked fluorescent green. Other medication has given me a chronic nose cold, after not even a month of trying. This medicine breaks down the immune system, which cannot be good. I was really weak, I was worth nothing, and it did not improve my disease. This all because of prescribed medicines...” [Jolien/ F/25]*

The adverse effects of conventional medicines, interfered with interviewees’ ability to function at home and other areas in life. For instance, **Armand (50)** stopped taking Ritalin® for his ADHD because he became depressed. As he recounted “*eventually you are the disabled person, who can't do anything. Someone who doesn't know anything, who is just standing somewhere in a corner*”. Others echoed

Armand's case, by stating that their professional, emotional and social life was restricted by the use of conventional medicines. **Niels (28)**, suffering from mental health problems, was unable to perform at his job the day after he took medication that helped him to fall asleep:

*“For sleep problems I had to take pipamperone drops [an antipsychotic] before going to bed. After two minutes I fell asleep and the day after I was as dumb as a bag of hammers. I couldn't handle a shovel, I didn't know what to do with it. My boss sent me home eventually. I got a day off because you couldn't do anything with me. That's not an option. I'm not helped by that, that is a step backwards.” [Niels/M/28]*

Side effects of certain conventional medicines (e.g. painkillers and antidepressants) considered very problematic, and reported often during the interviews, were becoming emotionless, depressed, apathetic, unconsciousness, groggy and feeling empty. In this context sixteen interviewees used the word 'zombie' to describe their apathetic experiences. **Inge (52)** who was sexually abused as a child and who spent a quarter of her life on antidepressants, noted that while cannabis induced beneficial mental effects, the antidepressants altered her personality traits negatively. Another interviewee echoed this experience.

*“I have been taking antidepressants for fifteen years. Because of all this medication my personality changed. I became sharper, cold and hard. Medication causes a flat affect, you are no longer really happy or cheerful, and you no longer feel real anger and sadness. It is as if you are a robot or zombie. Nobody wants to live like that. Cannabis changes your personality too, but it made me more tolerant. It also causes some kind of flat affect, but in a different way. I'm more calm, but I'm still happy and cheerful. I do have emotions, which diminished for a part due to medicines.” [Inge/F/52]*

According to my respondents, another important adverse effect of medication was drug tolerance and dependence. This led to the increase in adverse effects. **Dirk (65)**, suffering from insomnia, noted that he had the feeling that the side effects of cannabis (mental effects) decreased over time, while the adverse effects associated with sleep medication were getting more intense. At the same time their active ingredients became less effective.

Interviewees' discourses on conventional medicines reflected common pejorative discourses on illicit (hard) drugs. Five participants spoke about being a *junkie* on conventional medications. **Roger (53)**, stated that he was completely *drugged* by the painkillers he had to take for his cluster headaches. **Armand (50)** said he looked like a *drug addict* in the hospital being under the influence of conventional pills, as he was trembling and sweating. Five respondents reported they had to withdrawal from conventional medicines. These participants noted that when they stopped their conventional treatments, they felt like a “*junkie*” and experienced withdrawal symptoms. Two respondents noted that they only felt 'high' when using particular antidepressants and painkillers, and not when using cannabis for chronic pain. **Sandra (42)**, using cannabis for mental health problems thought that pharmaceutical companies were the biggest *drug dealers* in our society. Finally, **Rudy (55)** commented that he was 'stoned' because of cannabis as well as tramadol:

*“Cannabis is no panacea. If I had to put my pain on a scale from zero to ten, then I would*

*say it relieves one point. I would be happy already when it relieves two points. So it's not a big difference. Morphine will help me more, but I also don't want to be a zombie. Rather a hippy than a junky, if you know what I mean. ” [Rudy/M/55]*

A few participants reported having no experience with adverse effects caused by conventional medicines. Finally, there were participants who had no experience with regular medicine use, and who were not able to compare their efficacy and side effects with cannabis.

#### 2.1.4.3 Cannabis, a last hope?

Above, we saw that two of the main reasons for initiating cannabis use were the ineffectiveness of other treatments and their adverse effects. Most of the time interviewees had undergone many treatments before they started experimenting with cannabis. More often, they had tried almost every therapy modern medicine had to offer and tested alternative treatments, but found no satisfactory or adequate treatment.

A few of my interviewees were suffering from life-threatening diseases, such as cancer and COPD. Seriously ill participants referred to cannabis as their last fragile hope, after all other treatments they had tried out in order to survive. For terminally ill patients cannabis was one of their experiments of which they did not know if it would cure or stabilise their diseases, or only improve their symptoms. These interviewees pinned their faith on cannabis. **Patrick (54)**, who suffered from metastatic lung cancer, started using CBD oil when the oncologists found out chemotherapy had no effect on his brain tumours. He received a terminal diagnosis and had only a few months left to live at the time of the interviews. The wife of **Hendrik**, a 78 year old COPD patient, expressed it this way “*He says, I have nothing left to lose. I can only win.*” And Hendrik responded “*That is true no? I have nothing left to lose. It is actually clutching at a straw.*”

Overall, many interviewees were distraught because of the inability to find satisfactory solutions for their chronic health problems.

*“Cannabis is my last hope, because I take Valium®, tramadol... The next is step is morphine. I'm at my wits' end. I don't know what to do because the pain dominates my life.” [Caroline/F/39]*

## 2.2 Physicians

This section focuses on the role of physicians regarding their patients' medicinal cannabis use. Most of the time cannabis use was discussed with interviewees' regular physicians and other healthcare professionals. Several participants exchanged knowledge about medical cannabis with their local pharmacists. Many interviewees had their cannabis use documented in their medical files and informed

the responsible physicians about their use, when they were visiting a doctor's practice or a hospital for treatments (e.g. surgery).

*"It is in my file at the oncologists. I'll see how they will react in the hospital. It's very plausible that they will send a social worker because "madam is on drugs". They cannot bring me to the police station, can they?" [Liesbeth/F/56]*

However, more often participants did not tell about their use to every physician they consulted. **Patrick (54)**, who suffered from schizophrenia, did not inform one of his psychiatrists about his use since he believed that most of them forbid it. His general practitioner, on the other hand, was aware of his cannabis consumption. A number of interviewees decided not to inform their general practitioners (GPs) for various reasons, including physicians' lack of interest and knowledge; not having a regular general practitioner; to avoid judgements; the fact that cannabis was an illegal substance; etc. Some participants could tell that their GPs were opposed to cannabis and decided not to disclose their use.

*"I wanted to talk about cannabis with my GP in order to obtain cannabis through other means, but I'm too afraid. I know he has confidentiality, but I'm not sure if I can trust on this. Also, I don't know my GP good enough for this. I'm afraid of his reaction when I will raise it. That he will look at me like "What is she asking?". If it was legal it would be more easy to bring it up." [Ashley/F/21]*

A number of interviewees' physicians were unaware of their patient's use, simply because respondents had not consulted these physicians during the time they were using cannabis. For example **Anthony (50)**, a MS patient who was in remission for already five years, had not seen his personal neurologist and general practitioner during this entire period.

Medical support for the use of cannabis was very diverse among self-identified medicinal cannabis users who discussed it with their physicians. Multiple interviewees reported that their physicians accepted and/or supported their use. Three respondents argued that their physicians noticed a difference with and without using cannabis, and were therefore supportive. Several interviewees noted that their medical specialists were glad that they had found a real solution because they ran out of treatment options themselves. The support of physicians helped some participants to cope with internal and external stigma, since it was a proof that their cannabis use was medically legitimate and justified.

While some physicians genuinely supported their patients' use, other physicians' attitudes tended more towards incurious acceptance or not explicitly disapproving of it. **Danny (55)**, noted that medical practitioners working at the hospice he visited regularly, were tolerant of him smoking joints as long as he was discrete. More often, physicians had no or very little interest in cannabis. They had no particular opinion, were sceptical, or were plain silent about the subject. When participants informed these physicians about their use, he or she did not or barely react, only wrote it down in their medical file or said it was fine, without further discussion or inquiry. Conversely, other interviewees reported that their physicians were sincerely interested and wanted to learn more about cannabis from their patients. Accepting medicinal cannabis use was not equal to believing in cannabis as a efficacious medical or

therapeutic treatment. Most interviewees could not tell if their physicians believed in the therapeutic potential of cannabis.

Several other interviewees had negative experiences with one or more physicians regarding the use of cannabis because they were critical or unsupportive. **Nicole (45)**, suffering from COPD, said that all her medical specialists supported her use, except for her pulmonologist who disapproved of it. According to Nicole, this physician wrote the following down in her medical file: *“patient is just addicted to cannabis. Does not want to hear about the pain clinic”*. Nicole thought that the pulmonologist should have admitted that cannabis helped her, because her COPD was slowly getting better. **Dirk (65)**, dealing with sleep problems, stated that his general practitioner told him that cannabis was *“an escape from reality”*. **Roger**’s narrative suggests that the medical community is unsupportive:

*“Most physicians would say that it’s bullshit, because it doesn’t help. One time I visited my GP and when he was called away, I was thinking “man, he was asking strange questions”. So, I turned my medical file towards me and it said literally “headaches result from marijuana use.” [Roger/M/53]*

Four interviewees noted that their physicians asked them to discontinue their cannabis treatments temporarily to test other medication or to evaluate their patient’s health status when he or she was not using cannabis. Some of these physicians thought that cannabis might play a part in their patients’ health problems. This was true for physical as well as mental problems. Some of **Jonas’ (25)** therapists deemed cannabis as a part of the causes of his depression, while he thought cannabis made him feel less depressed. According to my interviewees, when this period of cannabis abstinence was marked by deterioration of their health, physicians were mostly not (longer) opposed to the use of cannabis.

### 2.2.1 Medical supervision

The vast majority of the self-identified medicinal cannabis users were not supervised by a physician regarding their cannabis use. Multiple interviewees mentioned that their physicians were unwilling or unable to supervise their cannabis use, because of the harms of cannabis, their lack of knowledge, the illegal status of cannabis, etc. The illegal status of cannabis made it more difficult for self-identified medicinal cannabis users to speak freely about cannabis with their physicians.

Most of the time, conversations about consuming medicinal cannabis with physicians were superficial and short. Self-claimed medicinal cannabis users decided themselves what type of product, method of administration, dose and at what time they consumed cannabis. In very few instances interviewees received medical instructions from a physician regarding their cannabis use. When respondents had a physician who was involved in their cannabis treatment, it was still different from standard treatments. Most of the time physicians only wrote a prescription and/or gave general or vague advice.

Taking control over one's health can be positive and empowering, for instance by deciding on one's own treatment or cultivating one's own cannabis plants. Two interviewees touched upon this subject spontaneously.

*“A doctor prescribes medication and you take it. But in the case of cannabis oil, I can tell somehow what I feel and I can take less or more drops of it. I'm able to control it a bit more myself. When I took antidepressants, this wasn't possible. With cannabis it is possible to experience and to feel what is good and what is not. I think that is nice, taking your health into your own hands.” [Valerie/F/35]*

A number of my interviewees preferred to be supervised by a physician and regretted the lack of physicians who had experience and expertise on supervising medicinal cannabis use. Interviewees argued that very little was known about cannabis in mainstream medicine. Most participants were convinced that Belgian physicians have little or no knowledge about medical cannabis use and were unable to provide guidance. For instance, **Katrien's (45)** GP prescribed cannabis by copying the prescription of her neurosurgeon. He needed to ask Katrien where she was going to obtain cannabis. **Helena (60)** refers to her cardiologist's lack of knowledge on possible drug interactions between cannabis and drugs used to treat tachycardia:

*“There is a small damage to my heart, so I'm visiting a cardiologist. He gave me beta blockers. I have a too fast heart rate, so my heart rate has to go down. So I said to him “I'm using cannabis, does this work together?” and he said “No problem!”. But I think he doesn't know how cannabis works. To me, they are two opposites, one should bring your heart rate down and then you're taking something that increases it.” [Helena/F/60]*

Interestingly, it happened more often that physicians approached their patients for their expertise, turning the physician-patient relationship upside down. Physicians wanted to know more about medicinal cannabis use for other patients, going from practical questions (e.g. where to obtain cannabis) to requests for medical information. On request of his general practitioner, **Bernard (56)** had brought a couple of joints accompanied with a description to his general practitioner for other patients. **Kim's (31)** GP referred to Kim other patients who were looking for information about medicinal cannabis. Multiple interviewees in this study shared their knowledge and provided their physicians with a pile of literature on medicinal cannabis use, in order to get a better understanding from their physicians.

*I: “Do your physicians know anything about medicinal cannabis?”*

*R: “No, I have to explain everything to them actually. We are the information point for physicians, it is terrible...” [Jolien/F/25]*

Only few respondents declared that some of their physicians knew what they were talking about when discussing medicinal cannabis use.

### 2.2.2 Medicinal cannabis prescriptions

In Belgium, physicians are ‘allowed’ to prescribe unlicensed medicines because of what is called ‘therapy freedom’. As written in the law, practitioners cannot be subjected to regulatory limitations in the choice of the means being used, either for making a diagnosis, for setting up a treatment and its execution, or for the execution of compounded preparations (FAGG, 2017). During exploratory expert interviews with Belgian physicians, prior to the actual data collection, and during the interviews with my participants, it became clear that there are Belgian physicians who prescribe medical grade cannabis, although it is not lawfully obtainable in Belgium. Certain physicians are known in public for prescribing cannabis. However, my interviews also show that a significant number of participants and/or their physicians were not aware of this practice and thought it was impossible (illegal) for Belgian physicians to prescribe herbal cannabis products.

Since cannabis is an illegal substance in Belgium, physicians find themselves in a difficult position when it comes to prescribing cannabis. Respondents themselves realised that using cannabis on prescription was currently more delicate than taking conventional treatments. **Jolien’s (25)** case is a good example:

*“Every time I have to go get a prescription from the doctor to be able to obtain cannabis at the pharmacy. We are still going to the pharmacy, because this way we stand stronger legally. Furthermore, when I wouldn’t go to the pharmacy for more than a half year, my medical file would look strange. Then they might think “So cannabis isn’t necessary, because you are not using it? Why should we as doctors stick our neck out?” [Jolien/F/25]*

Multiple respondents in this study had asked their physicians to prescribe cannabis at some point in time. Cannabis was prescribed by general practitioners as well as medical specialists (e.g. an oncologist, pain specialist, psychiatrist, neurosurgeon, etc.). However, more often participants faced rejection, because physicians were not aware that they were allowed to prescribe cannabis; they were afraid of criminal charges; they were not allowed by the Belgian national medical association; they feared an invasion of other patients asking for prescriptions; distrust about their patient’s request; and the lack of scientific information, evidence and knowledge on safety and efficacy. One respondent’s general practitioner only wanted to prescribe cannabis because it was a repeat prescription from another physician.

Since interviewees encountered difficulties receiving medical cannabis prescriptions from their own physicians, some decided to search for other physicians willing to prescribe cannabis. For instance, **Anny (58)** found a psychiatrist from another region who was willing to prescribe cannabis, although she did not need cannabis for mental health problems but for chronic back pain. She said that the psychiatrist asked her to be discrete about the prescriptions, because he did not want to become known as the “*drugs doctor*”. It is important to note that the physicians responsible for the prescriptions of cannabis, are probably less or unfamiliar with the personal and medical histories of the patients. This can have negative repercussions for treatment outcomes. According to my interviewees, the consultations with these physicians served only to obtain prescriptions for cannabis and were over quickly.

*“I go to a physician in another town, and this is actually just a formality. The first time, I entered his office, he didn’t know anything about me. I brought documents [from a Belgian patient organisation] that said what he had to prescribe. The only thing he does is copying it on a prescription. He doesn’t know my entire medical file. I did explain my situation to him and mentioned all the pills that I’ve taken before. I assume that he knows what he is doing, but he asked me very few questions.” [Roland/M/47]*

Having cannabis prescribed in Belgium is more often challenging. This will be illustrated with one case. **Nicole’s (45)** first general practitioner prescribed cannabis. With this prescription she obtained cannabis in a Dutch pharmacy. When Nicole moved to another town she asked her new general practitioner for a prescription of cannabis, explaining that the pain medication she was taking caused severe side effects. Nicole was surprised by the reaction of the physician who said that she was not obliged to take those painkillers and that the GP would not prescribe cannabis. *“This was something younger physicians should deal with”*, the physician said. After this, Nicole went to another general practitioner for a prescription, but this doctor did not have the knowledge on how to prescribe cannabis. She ended up going back to her first general practitioner from her hometown for prescriptions.

### 2.3 Lay experts

Medical cannabis users probably differentiate themselves from other patients regarding the amount of knowledge they have about their treatments. They are forced to educate themselves, because information on medicinal cannabis is nearly inexistent in Belgium. Many interviewees informed themselves extensively before trying cannabis for the first time. Still, it was obvious from the interviews that the knowledge about cannabis varied among my respondents.

The majority were well-informed. Many medicinal cannabis users in this study had immersed themselves in the topic of medicinal cannabis and some of them are what can be called ‘lay experts’. Respondents used technical terms such as CBN, terpenes, endocannabinoid system, etc. While interviewees were not asked to give information about how cannabis works, they touched upon the technical and biomedical details of medicinal cannabis use many times during the interviews. They have spent many hours reading about the topic in the media, online and some of them gathered medical and pharmacological information from scientific articles. Based on their own experiences and information they gathered, conversations were led by the interviewees towards topics such as: the cannabis plant, its chemical components and how it functions; research about ingestion methods and cannabis products; clinical research; international policy developments; participants’ own ideas on future policies; etc. Only a few interviewees were less well-informed, for instance they were not aware of the chemical content of the cannabis plant (e.g. CBD and THC).

While these latter participants mostly reported their own experiences, large parts of other interviews covered participants’ knowledge and views on cannabis policy, scientific research and cannabis consumption methods. These respondents did not only report their own experiences but also explained



why they have those experiences based on information they had gathered from external sources. Some parts of the interviews were not even based on participants' own experiences but involved respondents sharing their extrinsic knowledge. In these interviews it was more often difficult to distinguish between respondents' own experiences and information they had retrieved from elsewhere. Some respondents seemed to be very eager to show (off) their expertise on medicinal cannabis and to educate the researcher. These interviewees might have felt the urge to share their knowledge with the interviewer to contribute to the research and to help the researcher. Or they demonstrate their knowledge to show that they are medical cannabis experts to increase the legitimacy of their use and to distance themselves from non-medical cannabis use(rs) (Pedersen & Sandberg, 2013).

### 2.3.1 Gathering information

Similar to the findings of Athey et al. (2017), Lankenau et al. (2018a) and Pedersen (2015) self-identified medicinal cannabis users learn about medicinal cannabis use mainly by carrying out research themselves and by experimenting. Medical professionals play little or no part in informing and guiding medicinal cannabis users (cf. Reinerman et al., 2011). Information on medicinal cannabis use was mostly gathered through the internet. Individuals learned from other users on social media platforms, mainly Facebook, and from information available on specialised websites on medicinal cannabis (e.g. International Association for Cannabinoid Medicines (IACM)).

Several interviewees regretted and were frustrated about the lack of information and awareness in Belgium. They had to figure out their treatments on their own, without medical guidance. Most of the time they ended up still having questions. Many respondents advocated for more scientific information and argued that more research had to be performed to prove whether or not cannabis was efficacious for certain conditions. Consistent with the study of Swift et al. (2005) some of my interviewees were eager to participate in clinical trials, to show medical professionals how their health status is with (positive) and without (negative) using cannabis. For instance, one respondent had asked his surgeon and general practitioner multiple times if there were studies in which he could participate. However, he was told no such studies existed in Belgium. Several interviewees asked the researcher of the present study if she was aware of ongoing clinical research at her university and if she could inform them about future studies.

### 3. Discussion

#### 3.1 Conventional medicines

Self-identified medicinal cannabis users were critical towards, dissatisfied with, and eschewed conventional medicine. Earlier, we saw that self-identified medicinal cannabis users employed cannabis as a substitute for conventional medicines. In line with other research, my results suggest that participants were able to reduce their prescription medicines (Swift et al., 2005; Zaller et al., 2015; Piper et al., 2017; Boehnke et al., 2019), but did not eliminate all of them. About half of the survey sample used other medications regularly alongside cannabis. The main reason for people using conventional medicines concurrently with cannabis is because it is instructed by a physician. Next, participants indicated that they still use conventional medicines because they are legal, more accessible, cheaper and socially accepted. This result is in agreement with the interview findings that illustrate that the access to cannabis is problematic and using cannabis is still stigmatised in Belgium due to its illegal status.

For most respondents cannabis was an additional treatment, which is typical for alternative treatments (Debas et al., 2006). About forty percent of the self-identified medicinal cannabis users who use prescription drugs, reported that they still used them because using cannabis alone as a treatment is insufficient for their conditions. These results are in line with the finding that cannabis is perceived not to be able to improve symptoms completely and does not cure conditions. The interviews showed that cannabis was not a solution for all participants' symptoms and medical conditions, and that self-identified medicinal cannabis users did not think of cannabis as a panacea or cure-all.

Still, the vast majority of the interviewees, as well as the survey participants, stated that cannabis is more effective than conventional medicines and causes less adverse effects (cf. Swift et al., 2005; Zaller et al., 2015; Walsh et al., 2013; Boehnke et al., 2019; Boehnke et al., 2016). These two findings are both important reasons for people to try out cannabis as a treatment for the first time. Whether a drug is illicit or licit, almost every drug causes side effects and has health risks, some drugs more than others. This is true for strong medication (e.g. opioids) in particular, which are often the only effective remedy for severely or chronically ill patients. In comparison with some of these strong medications' adverse effects, the side effects of particular cannabinoid medicines seem to be less severe. In this respect cannabis can be viewed as a potentially safer treatment. However, more high-quality clinical research is needed to compare cannabis treatments to particular conventional medicines regarding efficacy and adverse effects when using it for particular medical conditions.

People who experiment with medicinal cannabis use were often not able to find satisfying solutions in conventional medicine. Consistent with findings from other studies (Lau et al., 2015; Pedersen & Sandberg, 2013; Coomber et al., 2003; Pedersen, 2015; Dahl & Frank, 2011), self-identified medicinal cannabis users preferred plant-based cannabinoid products over other "*chemical*" medicines, by emphasizing their natural characteristics and therefore they were considered superior to conventional treatments. However, these results have to be interpreted with caution since this sample was self-selected

and thus positive attitudes are likely overrepresented. This study did not compare cannabis to specific types of medications. With regards to analgesics, cannabis was not always perceived superior in efficacy, but preferred because it caused less side effects. My survey results suggest that prescription drugs were still used alongside cannabis by a large subpopulation of the sample. Previous studies suggest that opioids and cannabis can have synergetic effects when used concurrently (Pertwee, 2009; Abrams et al. 2011). However, only few interviewees in the present study noted that they ingested the two substances simultaneously.

Cannabis was reached out to as a last hope by people who were desperate to find a proper treatment. In countries where cannabis is regulated as a medicine, more often it is only recommended when other treatments have failed (e.g. herbal medicinal cannabis in the Netherlands (BMC, 2018)). This is currently also the case for Sativex® in Belgium (FAGG, 2017).<sup>42</sup> In this way, in a regulated model, cannabis remains a last hope, and at the end of the line when no other treatment is proven to be successful. When there is solid scientific evidence for the efficacy and safety of a particular cannabinoid medicine in certain diseases, cannabis should be considered as a first-line treatment.

### 3.2 Physicians' support and supervision

The survey results suggest that most patients inform their general practitioners about their cannabis use. This finding corroborates previous studies looking into this topic (Piper et al., 2017; Belle-Isle et al., 2014; Lintzeris et al., 2018). The primary motives for not informing physicians were the illegal status of cannabis, motives related to stigmatisation and the lack of knowledge on the part of physicians. Patients who discussed medicinal cannabis use with their physicians argued that physicians were overall poorly informed and noted the absence of well-informed physicians. All these barriers can be remedied by regulating medicinal cannabis use properly.

My results indicate that most physicians are understanding and do not disapprove of their patients' cannabis use. However, more often patients were confronted with physicians who responded indifferently or uninterested. Some self-identified medicinal cannabis users were confronted with their physicians expressing disapproval. Exclusively medicinal cannabis users seem to receive slightly more perceived support for their cannabis use than current recreational cannabis users. It is possible that some physicians are concerned that their patients will be masquerading their recreational use as medicinal use, to get more support and in order to obtain cannabis (Ziemianski, et al., 2015; Kondrad & Reid, 2013). Overall, stigmatisation can impair the physician-patient relationship and have a negative influence on treatment outcomes (Satterlund et al., 2015). Therefore, the current illegal status may impede effective

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<sup>42</sup> "Sativex® is indicated as a treatment for the alleviation of symptoms in adult patients with moderate to severe spasticity due to multiple sclerosis (MS) who have not responded adequately to other anti-spasticity medication and who have shown a clinically significant improvement in their initial trial treatment period the spasticity-related symptoms." (FAGG, 2017)

patient–physician communication and jeopardise the fiduciary relationship between the physician and patient.

Although self-identified medicinal cannabis users indicate that most of their physicians are not opposed to cannabis, most of them are not supervising their patients' use. Only ten percent of the survey respondents think that they are properly supervised by a physician. Almost all of my interviewees started off with self-medicating with cannabis and most still were at the time of the interviews. This imposes risks regarding treatment outcomes, especially for individuals who are vulnerable because of their poor health. In this way, physicians are not aware of possible harmful interactions between cannabis and other treatments. Other common risks of self-medication are delays in seeking medical care, adverse events, incorrect self-diagnosis, incorrect administration methods, incorrect dosage, dependence and abuse (Ruiz, 2010). However, because of the lack of medical training and the ambiguous legal status of cannabis, it is unlikely that Belgian physicians are able to provide proper medical guidance at the current moment (Nolf, 2004). Consequently, the risks of self-medication will not be eliminated by simply involving medical practitioners.

The results show that most participants were not sure if their physicians believed in the therapeutic potential of cannabis. This might be an indication of the lack of sufficient conversations between physicians and their patients on medicinal cannabis use. Interviewees noted the lack of interest and knowledge among their physicians, and stated it were mainly short discussions they had with their physicians about medicinal cannabis use (cf. Bobitt et al., 2019). In the study of Belle-Isle et al., (2014) with medicinal cannabis users in Canada, half of the respondents who talked with their physician about their medicinal cannabis use were less satisfied about these talks compared to their conversations regarding other medical matters.

The interview findings show that individuals were willing to obtain cannabis through legal means. However, over two thirds of the self-identified medicinal cannabis users in this survey have never asked a physician for a prescription. The interview results illustrate that it is possible that multiple participants were not aware of the possibility for Belgian physicians to write prescriptions for cannabis, that give patients access to cannabis products sold in Dutch pharmacies. Of the survey participants who asked physicians for prescriptions, more than half were confronted with physicians refusing to prescribe cannabis. When Belgian physicians write prescriptions for cannabis, they are operating in a legal grey zone, putting themselves and their patients in a sensitive position. Transporting medicinal cannabis from Dutch pharmacies into Belgium remains illegal by law and physicians might feel responsible for 'sending their patients into illegality'. In addition, it is likely that Belgian physicians feel uncomfortable in prescribing cannabis because of the lack of conclusive scientific evidence on risks and safety; their lack of knowledge on consuming patterns; and lack of confidence in their competence to adequately advice patients (Sullivan, 2012; Lucas, 2012; Gieringer, 2003; Ziemianski, et al., 2015; Fitzcharles et al., 2014; Mitchell et al., 2016). Therefore, it is unsurprising that physicians are unwilling to prescribe cannabis and supervise its use in this current ambiguous and unsupportive legal climate. Self-identified medicinal cannabis users searched for other physicians willing to prescribe cannabis when having

cannabis prescribed by their own physicians was not an option (cf. Satterlund et al., 2015; Belle-Isle et al., 2014). Even in countries where medical cannabis use is regulated, cannabis is many times prescribed by physicians other than patients' own general practitioners (Lankenau et al., 2018). This can have negative treatment outcomes as those physicians are probably less familiar with the patients' medical histories.

Previous studies show that implementing a medical cannabis program is not enough for physicians to support, supervise or prescribe cannabis (e.g. Lucas & Walsh, 2017 in Canada and Bobitt et al., 2019 in Colorado (US)). When medical cannabis programs are developed it is important to involve physicians to ensure cannabis becomes normalised and is not a last option treatment for conditions for which there is conclusive scientific evidence on efficacy and safety. Educating and training physicians is essential for medicinal cannabis policies to succeed as physicians are important gatekeepers for the access to cannabis (Ebert et al., 2015). Currently, Belgian medical students are not educated, or educated to a very limited degree, about medical cannabis, (phyto)cannabinoids and the endogenous cannabinoid system (Nolf, 2004). Even if medicinal cannabis remains illegal and unregulated, education on cannabis' therapeutic benefits and harms is essential, as we saw that my participants inform and ask their physicians questions about medicinal cannabis, in spite of its illegal status. I assume that this group of patients seeking medical advice will only expand with new patients, because of the warp speed of sharing health information and anecdotal evidence regarding medicinal cannabis use on the internet.

### 3.3 Self-medication

Because of the lack of information and educated physicians capable of supervising medical cannabis use, self-identified medicinal cannabis users were forced to self-medicate. Patients medicating themselves and being less dependent on the health care system does not only pose risks, but can also have important benefits such as the promotion of empowerment and the reduction of health care costs (Hughes et al., 2001). We are moving away from the paternalist physician-patient model and there is an increasing trend of (chronic) patients informing themselves extensively through online health information resources. They spend significantly more time on reading about their disease or condition online compared to their own general practitioners. In the case of self-identified medicinal cannabis users, we can say that the patient-physician relationship was turned upside down as patients became more or less the experts. Physicians might have felt uncomfortable and threatened in this new 'inferior' position and might have found it hard to accept receiving knowledge from their patients (Pedersen & Sandberg, 2013). However, my interviews illustrated that some physicians themselves asked their patients for information. Previous research shows that internet health information-seeking can even improve the patient-physician relationship, depending on whether the patient discusses the information with the physician, and on their prior relationship (Tan & Goonawardene, 2017).

## Chapter 6

### Social acceptance and stigma

#### *Introduction*

Despite increasing cannabis normalisation (Järvinen & Demant, 2011; Hathaway et al., 2011), studies show that significant numbers of medicinal cannabis users still feel stigmatised and experience social disapproval in various social contexts (Satterlund et al., 2015; Bottorf et al., 2013, Leos-Toro et al., 2018). The stigma of cannabis undermines health care-seeking behaviour, and therefore threatens successful treatment outcomes (Satterlund et al., 2015). In this chapter I examine the stigma-related feelings, experiences and responses of self-identified medicinal cannabis users (see 1. and 2.).

The interview section (see 2.) is structured according to the conceptual framework on stigma developed by Link et al. (1997) in which three components of stigma are described. The section starts with the first component of stigma, which is the *culturally-induced expectation of rejection* (see 2.1). Internalised stigma and justifications of medicinal cannabis use were widely prevalent among my interview sample. In the subsequent sections I explore the second component of stigma used in the framework developed by Link and colleagues, which is *cognitive and behavioural coping mechanisms*. These mechanisms are already triggered when one is contemplating the possibility of using cannabis as a medical treatment (see 2.2). The following sections in this chapter address cognitive coping strategies for stigma used by my interviewees. These include the dissociation from recreational cannabis use and other drug use (see 2.3.1), normalisation (see 2.3.2), claiming self-control (see 2.3.3) and the comparison of drugs' risks (see 2.3.4) (Peretti-Watel, 2003). The stigma of using cannabis for medicinal purposes affects people's decision on disclosing their use. In the subsequent sections behavioural coping strategies are explored with regards to the disclosure of cannabis use (see 2.4). The final section on social acceptance focusses on the third and last component of stigma conceptualised by Link et al. (1997), which covers *stigmatised experiences* (see 2.5).

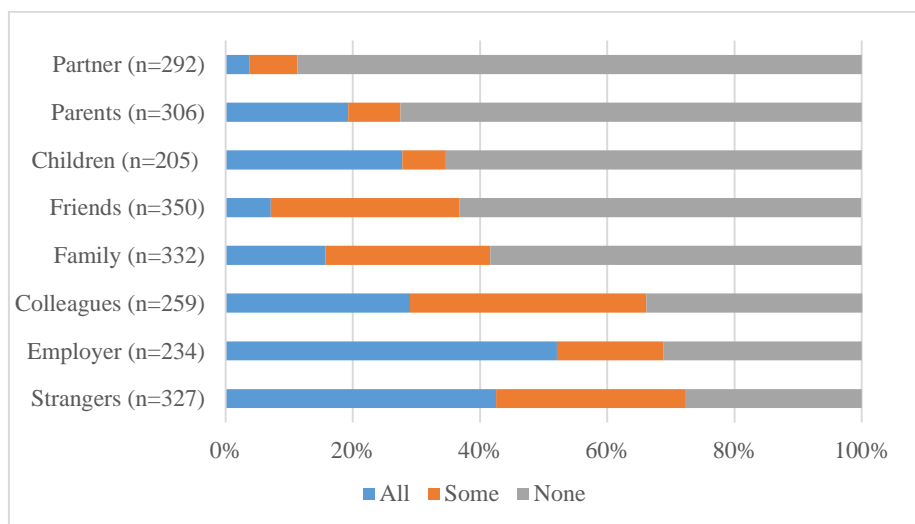
The results section of this chapter finishes with the discussion of self-identified medicinal cannabis users' legal concerns and ramifications (see 2.6).

## 1. Results of the survey

To assess stigma-related feelings among self-identified medicinal cannabis users, survey participants were first asked if they concealed their cannabis use. For this question I presented a list of people with whom people have different types of social relationships (e.g. children, parents, employers, etc.). For each item respondents had to indicate on a Likert scale if they concealed their use for everyone; if they disclosed their use for some; or if they disclosed their use towards everyone.

Although the majority of participants did not hide their cannabis use from partners, children, parents, family and friends, there were still a number of respondents who indicated that they concealed their use from at least some of them. At work, more than half of the sample did not disclose their use to their employer(s) (n=112; 52.1%) and to at least some of their colleagues (n=184; 66.1%). In the case of strangers, more than half of the respondents indicated hiding their cannabis use (see **figure 12**).

**FIGURE 12: CONCEALING CANNABIS USE FROM OTHERS**



N varies, because participants who did not have a particular social relationship were asked to select 'does not apply' (e.g. children). 27 participants did not answer this question because they did not complete the survey entirely.

When participants indicated that they concealed their use from certain others at least once, they were presented a list with possible reasons for hiding cannabis use from which they could select multiple answers. The data show that the majority concealed their use to avoid judgement (n=179; 65.1%). Other important reasons were the increased risk of getting caught (n=126; 45.8%), privacy matters (n=125; 45.5%) and the fear that people will disapprove of it (n=92; 33.5%) (see **table 52**).

**TABLE 52:** SURVEY PARTICIPANTS' REASONS FOR CONCEALING THEIR CANNABIS USE

	<b>Total (n=275)*</b>		<b>Exclusive medical (n=61)</b>		<b>Previous recreational (n=68)</b>		<b>Current recreational (n=147)</b>	
	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>
Avoiding judgement	179	65.1	31	50.8	46	67.6	98	66.7
Increased risk of getting caught	126	45.8	19	31.1	34	50.0	71	48.3
Privacy reasons	125	45.5	26	42.6	35	51.5	62	42.2
Fear that people will disapprove of it	92	33.5	17	27.9	27	39.7	47	32.0
Not wanting other people to know it	74	26.9	17	27.9	16	23.5	40	27.2
Fear of getting fired	71	25.8	8	13.1 <sup>a</sup>	17	25.0	45	30.6 <sup>a</sup>
Respect for the feelings of nonusers	65	23.6	7	11.5 <sup>a</sup>	16	23.5	41	27.9 <sup>a</sup>
Setting an example for children	52	18.9	6	9.8	13	19.1	33	22.4

\*N=275, because 26 participants did not answer this question because they did not complete the survey entirely. This question was only shown to participants who indicated in a previous question concealing their use. Totals exceed 100% because multiple responses could be cited.

<sup>a,b</sup> groups with the same superscript differ significantly from each other at a significance level of  $p \leq 0.017$ , tested using Chi<sup>2</sup> test.

I looked for differences between the three subgroups with regards to the disclosure of cannabis use and reasons for concealing cannabis use. Exclusively medical cannabis users appeared to be less likely to conceal their use from their children compared to current recreational cannabis users ( $p=0.011$ ). Apart from this difference, there were no other significant differences between the three subgroups regarding their concealing of cannabis use (see **table 53**). I also found few significant differences between reasons for concealing use. Exclusively medical users were less likely to choose the option 'the fear of getting fired' as a reason to conceal their use compared to current recreational users ( $p < 0.01$ ). This can be explained by the fact that there are less people employed among the first group. The exclusively medical group was less likely than the current recreational group to conceal their use out of respect for the feelings of nonusers ( $p < 0.05$ ) (see **table 52**).

**TABLE 53:** CONCEALING CANNABIS USE FROM OTHERS (COMPARISONS BETWEEN THE THREE SUBGROUPS)

	<b>Exclusive medical</b>		<b>Previous recreational</b>		<b>Current recreational</b>	
	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>
<b>Partner</b>						
Yes	7	9.9	8	11.1	17	12.0
<b>Children</b>						
Yes (at least one)	13	22.4 <sup>a</sup>	18	35.3	39	42.9 <sup>a</sup>
<b>Parents</b>						
Yes (at least one)	20	32.8	18	22.5	44	27.7
<b>Family</b>						
Yes (at least one)	23	32.4	38	45.2	74	43.5
<b>Employer</b>						
Yes (at least one)	31	66.0	39	72.2	87	68.5
<b>Colleagues</b>						
Yes (at least one)	33	64.7	41	68.3	93	66.0
<b>Friends</b>						
Yes (at least one)	33	42.3	33	37.1	61	34.7
<b>Strangers</b>						
Yes (at least one)	50	70.4	58	72.5	123	72.8

<sup>a,b</sup> groups with the same superscript differ significantly from each other at a significance level of  $p \leq 0.017$ , tested using Chi<sup>2</sup> test.



Social acceptance of medicinal cannabis use by important others was measured by perceived support of family and friends. Participants had to rate the attitudes of their family and friends on a Likert scale ranging from ‘very negative’ to ‘very positive’. Few participants reported receiving solely negative reactions from friends (n=5; 1.6%) and family (n=27; 9.1%). Survey participants appeared to receive more positive feedback from friends than from family (see **table 54**).

The family of exclusively medical users appear to be perceived as more supportive than the other subgroups’ families (p<0.01). Regarding friends’ attitudes, there is no significant difference between the three subgroups (p=0.582) (see **table 54**).

**TABLE 54: PERCEIVED ATTITUDES OF FAMILY AND FRIENDS TOWARDS SURVEY PARTICIPANTS’ MEDICINAL CANNABIS USE**

	Total sample		Exclusive medical		Previous recreational		Current recreational	
	N	%	N	%	N	%	N	%
<b>Attitude family</b>	<b>(n=298)*</b>		<b>(n=65)<sup>a,b</sup></b>		<b>(n=71)<sup>a</sup></b>		<b>(n=157)<sup>b</sup></b>	
Very negative	8	2.7	0	0.0	1	1.4	7	4.5
Negative	19	6.4	1	1.5	6	8.5	12	7.6
Mixed	161	54.0	25	38.5	43	60.6	89	56.7
Positive	79	26.5	26	40.0	13	18.3	39	24.8
Very positive	31	10.4	13	20.0	8	11.3	10	6.4
<b>Attitude friends</b>	<b>(n=310)**</b>		<b>(n=63)</b>		<b>(n=81)</b>		<b>(n=159)</b>	
Very negative	0	0.0	0	0.0	0	0.0	0	0.0
Negative	5	1.6	0	0.0	3	3.7	2	1.3
Mixed	126	40.6	24	38.1	35	43.2	63	39.6
Positive	115	37.1	26	41.3	27	33.3	62	39.0
Very positive	64	20.6	13	20.6	16	19.8	32	20.1

\*N=298, because 27 participants did not answer these questions because they did not complete the survey entirely. This question was not shown to participants who indicated concealing their use from their entire family in a previous question (n=48). Eight participants answered ‘I don’t know’ on this question.

\*\*N=310, because 27 participants did not answer these questions because they did not complete the survey entirely. This question was not shown to participants who indicated concealing their use from all their friends in a previous question (n=30). 14 participants answered ‘I don’t know’ on this question.

<sup>a,b</sup> groups with the same superscript differ significantly from each other at a p<0.05 tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni

The (social) setting of medicinal cannabis use was assessed by asking participants how frequently they had used cannabis at particular locations during the past twelve months (e.g. home, work, Dutch coffee shops, etc.) and with particular people (e.g. friends, family, etc.). For each item I used a Likert scale with the answer options ‘never’, ‘rarely’, ‘sometimes’, ‘often’ and ‘always’. In the table below the categories ‘rarely’ and ‘sometimes’ as well as the categories ‘often’ and ‘always’ were merged.

Cannabis is mainly used at respondents’ homes; 96.3% (n=337) use cannabis often or always at home. More than half of the sample have used cannabis at a friend’s home, a social event and in a public place the past twelve months. Less than twenty percent have used cannabis at work and in medical settings (e.g. hospital). Most participants use cannabis alone. Over half have used cannabis with friends and acquaintances during the past twelve months. Less than a quarter have used cannabis in the presence of medical professionals (see **table 55**).

**TABLE 55: SOCIAL SETTING OF USE OF THE PAST TWELVE MONTHS**

<b>Location (n=350)*</b>	<b>Never</b>		<b>Rarely-sometimes</b>		<b>Often-always</b>	
	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>
At home	4	1.1	9	2.6	337	96.3
At friends' homes	106	30.3	175	50.0	69	19.7
At a party or social gathering	146	41.7	139	39.7	65	18.6
Public places outside	169	48.3	139	39.7	42	12.0
In bed	214	61.1	82	23.4	54	15.4
At a Dutch coffee shop	189	54.0	120	34.3	41	11.7
At family's homes	216	61.7	117	33.4	17	4.9
At a pub, bar or nightclub	219	62.6	109	31.1	22	6.3
In a car	272	77.7	62	17.7	16	4.6
At work	290	82.9	47	13.4	13	3.7
Medical settings	284	81.1	55	15.7	11	3.1

<b>Accompanied by (n=352)**</b>						
Alone	16	4.5	57	16.2	279	79.3
Friends	79	22.4	182	51.7	91	25.9
Acquaintances	151	42.9	166	47.2	35	9.9
Family	183	52.0	137	38.9	32	9.1
Strangers	215	61.1	121	34.4	16	4.5
Medical professionals	277	78.7	59	16.8	16	4.5

\*N=350, because 31 participants did not answer this question because they did not complete the survey entirely.

\*\*N=352, because 39 participants did not answer this question because they did not complete the survey entirely.

Current recreational cannabis users consume cannabis less often at home compared to both other subgroups. They are more likely to use it at social events, Dutch coffee shops, and friends' homes than previous recreational users. Exclusively medicinal cannabis users are the least likely to use cannabis at those locations. Current recreational cannabis users are also more likely to consume cannabis at a pub, in a car, in public places and at a relative's home than both other subgroups. They are more likely to use cannabis together with friends, acquaintances, family and strangers (see appendix 1, **table 55a**).

## 2. Results from the face-to-face interviews

### 2.1 Culturally-induced expectation of rejection

Multiple interviewees expressed culturally-induced expectations of rejection (Link et al., 1997) with regards to their cannabis use and reacted upon this in daily life by developing behavioural and cognitive coping strategies.

Culturally-induced expectations of rejection were noticeable among interviewees who realised that cannabis was condemned by powerful groups and that cannabis users were negatively perceived in general. Multiple participants were convinced that when particular others would find out about their use, “they would be perceived differently and would get a label”. In their narratives they used pejorative terms such as ‘junkie’, ‘drug user’, ‘drug addict’, ‘criminal’ and ‘I’m on drugs’ to describe how they presumed to be perceived by our society. As one respondent noted: “Other people think of it solely as an addictive drug. Not a patient, no I’m a drug user.” **Leo (54)**, suffering from bowel and back problems, called himself a ‘drug user’ fifteen times during the interviews to illustrate its negative connotation and his unfortunate social position. In these contexts, many times the word ‘drugs’ was emphasised, indicating that drugs are taboo. **Frank (47)**, living with chronic pain and ADHD, actively resisted the stigma and justified his use throughout the entire interview multiple times. He narrates frustratedly:

*“I don’t care about people who want to stigmatise me for using cannabis. And despite the law, if they want to demonise or criminalise me because I found a plant that cures me, takes my pain away and makes me a little bit happy. Then I think ‘Fuck you’ [laughs]. Sorry. I don’t care [emphasis]. My friends and family are not going to treat me differently, absolutely not.” [Frank/M/47]*

Seven interviewees stated spontaneously that they were not ashamed nor felt guilty about their use. These denial claims are at the same time masked stigma-related feelings, which were noticeable throughout many conversations with the interviewees. Only three participants said they felt ashamed and/or guilty about their cannabis use. **Bruno (55)**, suffering from cancer, felt guilty from time to time because he was indoctrinated with the fact that cannabis is a “drug”, and because he was involved in ‘criminal’ activities (i.e. cultivating cannabis). He never used cannabis in the presence of his son because he felt too embarrassed.

### 2.2 Convincing oneself to use cannabis

Fifteen participants had pronounced negative views on cannabis when they were younger and prior to their first initiation to the substance. Initially, cannabis was viewed as a ‘drug’ and drugs are “dangerous for one’s health” and “taboo”. Therefore, some of them experienced barriers and felt uncomfortable or

anxious when initiating the use of cannabis and with the thought of being a ‘cannabis’ or ‘drug user’. The illegal status of cannabis caused doubts and hesitation to initiate the use of the substance. This original negative image was mainly constructed by how participants were raised and/or their social interactions in their youth of which cannabis was not a part. **Anny (58)** who had no experience with using cannabis prior to her medicinal use, described her negative attitudes in the following way:

*“It took a long time before I dared to try marijuana, and in that way my impression about cannabis changed a lot. Because for me, cannabis was a dangerous devil, it was a ‘drug’. Anyway, this is the way I’ve been raised, I’ve learned it this way.”* [Anny/F/58]

Because of these hurdles several interviewees decided to try cannabis for the first time only months or years after being introduced to it. Most of the time, their anti-cannabis attitudes changed only after gaining a lot of information about the subject or based on their own positive experiences. Cannabis’ status transformed from a malicious drug to an indispensable medicine. Still, for some cannabis was not entirely positive. **Caroline (39)**, who had only used cannabis paste a few times for chronic pain, still did not want other people to smoke cannabis near her or in her house:

*“At my wits end I approached someone who could help, and said “Look, I’m completely against cannabis. Because I saw that my brother suffered heavily from it, lost his work, got addicted, etc., but the pain is becoming unbearable.” I have always been radically opposed to it. People should stay away from me if they smoke it. I also don’t like the smell. I think it is horrible. So, I was like I’m against it, but now I am going to use it myself. It was actually against my principles.”* [Caroline/F/39]

Other participants were never opposed to cannabis and were open to trying it. Some of them were already experienced recreational users. Also novice users were not always held back by the stigma, because they believed it was no different from trying other medicines.

### 2.3 Cognitive coping strategies for stigma

*“People need to abandon this image of people who smoke as layabouts. Of course there are people who do this, but this is much more common among people who like to drink than people who like to smoke a joint. There are of course people who like to smoke and who do nothing, but those are already lazy people in general. This has nothing to do with the fact that this person consumes cannabis.”* [Jeroen/M/34]

This quote shows that Jeroen believes that cannabis users are despised, and he tries to disprove this negative image, by stigmatizing other user groups. This section presents many of the arguments participants used to justify medicinal cannabis use.

Respondents argued that they “were not doing anything wrong by using cannabis and that it did not harm anyone”, putting forward the victimless crime argument (Klein & Potter, 2018; Sykes & Matza, 1957). One respondent called upon the right to self-medicate. Participants took the stance that they have the right to have access to treatments and they felt discriminated against because of the difficulty in

accessing cannabis. As one man recounted “*Why should someone be severely punished when he or she only is trying to get rid of pain?*” Two respondents called it “*criminal*” to deny patients access to cannabis, because these patients were suffering unnecessarily.

*“Take cannabis away from me and you will take away my health, you can’t do that, isn’t it? That is just criminal, such practices. I don’t harm anyone, I wouldn’t hurt a fly. Who am I bothering when I have plants in my garden? For God’s sake, I’m an adult. I don’t think I look like a junkie. Leave us alone, for heaven’s sake.”* [Vivian/F/53]

Participants were convinced that they would not get criminally charged for the ‘minor’ offences they committed. **Jolien (25)**, living with MS, noted “*I stand my ground, they will not put me in jail just like that, only because I want to get rid of pain, no*”. Jolien justifies her use by emphasizing the medical need, which is more accepted by society than using a psychoactive substance as a means to experience pleasure. Interviewees *appealed to higher loyalties*, one of the five neutralisation techniques outlined by Sykes and Matza (1957). By suggesting that using cannabis is for the greater good (health), with positive long term consequences that justify their use. The interviewees resisted a stigmatised and criminal identity. For instance, four respondents stressed that they were not “*criminals*” for using cannabis.

When discussing the social acceptance of cannabis, respondents referred more often to their (human) rights. Participants argued that they have the right to “*a life that others have, a human life*”. They believed it was their right to take care of their health and that others do not have the right to interfere with it. **Kim (31)**, who suffered from a progressive neuromuscular disorder and who was in a wheelchair observed “*Eventually no one can ever know to what extent someone else is suffering. If it helps me, it is no one else’s business. They should have my disease for a week, they will change their tune.*”

Seven respondents argued that people who (ab)use alcohol or pharmaceutical pills do not have the right to condemn cannabis use(rs), and that they are hypocrites since they use more harmful substances themselves. **Willy (70)**, suffering from chronic pain, describe it as follows:

*“I have every right, and each human has every right, to make sure that he or she has, in the best possible way, a healthy and liveable life. Nobody is obliged to take chemical rubbish. They can come and say it to my face. I will say straight-forwardly “I have the right to live like you do, don’t I?” Or otherwise I would just ask them “Can I have a look in your medicine cabinet?””* [Willy/M/70]

Multiple respondents thought it was unjust that they were ‘*criminalised*’ and ‘*marginalised*’ because of their medicinal cannabis use. **Carine (46)** commented that the police should not bother individual users and focus on criminal organisations responsible for trafficking cannabis on a large scale. In this way, she passes the responsibility and stigma onto individuals who are driven by financial motives. Three participants noted that cannabis users should not be bothered, since there are more serious criminal offences. **Jolien (25)**, an MS patient, thought that it was unfortunate that medical cannabis patients are being chased:

*“We stand our ground, we use medication from nature. Why would they forbid a plant? Which they don’t even know. We have the feeling we’ve been pushed in the margins of society, because we have to fight constantly to justify our way of life.” [Jolien/F/25]*

### 2.3.1 Dissociation from recreational cannabis and other drug use: “relaxed but not stoned”

A commonly utilised strategy among drug users to cope with stigma is dissociating oneself from other groups of drug users that are more stigmatised, also known as ‘scapegoating’ (Peretti-Watel, 2003; Sandberg, 2012; Pedersen, 2015). In this study self-identified medicinal cannabis users resisted stigma by creating symbolic borders between themselves and recreational cannabis users, similarly as described in the study of Pedersen (2015). This strategy was more common than distancing oneself from other types of (hard) drug use(rs) (e.g. cocaine or heroin use). When the stigmatised group (i.e. recreational cannabis users) is close to the other group of substance users (i.e. medicinal cannabis users) it is important for users to draw social borders (Copes, 2016). Since medicinal cannabis use is a new phenomenon, and the boundaries between recreational and medicinal use are still blurred, interviewees emphasised the differences between the two types of use to gain social acceptance.

A subset of respondents I interviewed tried to detach themselves from the negative label associated with drug use overall, by illustrating and emphasizing that they were not equal to a “*typical drug user*”, “*addict*” or “*junkie*”. Participants’ narratives about other drug users show that they label ‘other’ users with stigmatizing stereotypical terms, such as ‘addicts’ or ‘junkies’. These ‘other’ users were many times a fictitious group of recreational drug users, instead of real individuals whom the participants personally knew. The negative representations illustrate that interviewees did not identify themselves with certain groups of drug users and looked down on these groups. Because of stigmatisation, they considered their own use less morally inferior than other drug use(rs).

**Bruno**, a 55-year-old man suffering from cancer, distanced himself from other drug users by emphasizing presumed differences in physical appearance: “*As you can see it is clean in here. It is not like at drug addicts’ homes. We are moving at the moment, but normally it has to be clean here. We are not low class. People view it as criminal, but what you see here, no.*” He refers to his ‘clean’ living conditions to illustrate that he does not correspond with the stereotype of a deviant drug user. Finally, he emphasised that he fulfilled all his obligations: “*We keep our grandchild four times per week. So, I take care of her, we have to move soon, we take care of my parents, we have to do grocery shopping,... We have a lot of work to do.*” Similar to Bruno’s attitudes, more often, morally inferior drug users were thought of people who have a low socio-economic status. As **Frank (47)** argued “*I don’t have a diploma, but I’m not from the lowest class. I’m not occupied with watching reality TV. But I want to enrich my mind, I have informed myself extensively about medicinal cannabis*”.

In the interviews respondents tried to demonstrate that their identities and behaviour were distinct from the negative stereotypical image that people have of drug use(rs) in general. A more implicit example of this are respondents who stressed the fact that they were not addicted to cannabis, since addiction is

a highly stigmatised condition. Respondents who argued that they were able to live without cannabis for a longer period and did not crave it, may allude to the fact they are not addicted to the substance as a response to internalised stigma. As described by **Bernard (56)**:

*“There were moments that we had a bad harvest and we did not have the opportunity to drive to a Dutch coffee shop. Then it happened that we didn’t have cannabis for a day or two, but at those moments we are not shaking or we are not like “I must have, I must have,...”, like a junkie, so to speak. I’m not addicted to weed. So no panic, craving or physical symptoms. The funny thing is if we don’t have weed, we don’t have it and that’s it. But I do notice it when I don’t have cannabis, then I don’t sleep at all.”* [Bernard/M/56]

Previous studies show that people who use drugs disassociate themselves from other drug users by focussing on differences regarding physical appearance, the type of drug consumed, use patterns, purposes of use, etc. For instance, users of ‘soft drugs’ (e.g. cannabis) disassociate themselves from ‘hard drug’ users (e.g. heroin), because the latter are more stigmatised (Copes, 2016; Järvinen & Demant, 2011). In the study of Järvinen & Demant (2011), young participants used symbolic boundaries and neutralisation techniques to differentiate appropriate from non-appropriate cannabis use on several dimensions, including the setting, effects of cannabis and frequency of use. In chapter four I discussed the self-reported differences between recreational and medicinal cannabis use. In the present study, medicinal cannabis use was mainly disassociated from recreational cannabis use with regards to purpose of use (health versus recreational purposes), followed by experienced effects and use patterns.

Almost half of the interviewees claimed that they had no experience with recreational cannabis use (n=27) and others stated they were no longer using recreationally at the time of the interviews (n=7). It is certainly plausible these were truthful claims. However, the explicit denial of using cannabis for non-medical purposes might also be a strategy to avoid external stigma. For instance, one of my participants **Armand (50)**, living with ADHD and Tourette syndrome stated about his cannabis use *“I don’t see it any longer as recreational use”*. However, after this statement he said the following: *“When we went to Amsterdam recently, we sat there in a coffee shop and I ordered a coke and I rolled a big fat joint and I enjoyed it. Then I get high of course. It happens that I start laughing.”* This narrative appears to be contradictory to his earlier statement, as the description of the purpose of his use leans more towards non-medical use or what is commonly thought of as recreational cannabis use.

**Chris (37)**, living with multiple physical chronic conditions, argued: *“I’m like, my physician is informed, I mean [sighs]. It is really clear that it is not just to smoke pot. Because I don’t do that at all. I think that the police or judge should make a difference there.”* The argument that medical motives are morally superior to recreational motives for justification, was used by most of my participants. Chris continues the justification of his use by emphasizing self-control: *“I don’t care what other people think of me. I’m not ashamed of it, but I don’t have a drug problem.”* Finally, he distances himself explicitly from recreational drug users and the stigmatised higher intoxication levels: *“I use for medicinal purposes. I don’t want to be identified or associated with recreational use. I’m very black and white in this. It’s as if I am a druggie, while I’m not at all. I’m very aware what I’m doing, so I wouldn’t be*

*happy if people would think I use it for recreational purposes. Because I don't like using cannabis, I think it tastes bad, I don't like the feeling of being high. Not at all. And I prefer to have a clear mind."*

A common way of disassociating medical from recreational cannabis use is the argument that one is not 'lying on the couch the entire time', brought up spontaneously by nine of my interviewees. In this way, respondents referred implicitly to their ability to be productive, to function and have a clear mind. It indicates that they assume that cannabis users are perceived as the stereotypical languid user, also known as the 'amotivational syndrome' of cannabis (Chapkis, 2007). **Paul (59)**, and other respondents, acknowledged that there might be cannabis users who match this stereotype, but they argued that this is only true for a particular group of users, with whom they do not identify:

*"A misunderstanding that most people have, is that pot smokers want to lay and hang around all day. That is true for these really youthful boys, they want to get stoned. I don't want to get stoned. I want to be high and to be aware. I still want to be motivated to do stuff, like the dishes. I cannot afford to lay down here all day like a zombie."* [Paul/M/59]

When constructing symbolic boundaries, drug users contrast their own experiences with presumed experiences of other users (Copes, 2016), as illustrated in the next quote from **Roger (53)**, who suffered from cluster headaches:

*"For every cigarette that I smoke, I add a little bit of cannabis. Not a lot. Most people who smoke that I know add quite an amount of cannabis. They make a fat joint of a gram or something. But that is not the case for me. For me it is just enough, so to speak. I don't have to have a high. I don't have to have what most people look for in drugs, this overwhelming experience of disappearing in yourself. I must be able to continue to function, I need to order my thoughts, I have to lead meetings, etc."* [Roger/M/53]

With regards to motives for cannabis use, interviewees appeared to believe that most recreational cannabis users desire to "become (very) high or stoned every occasion". However, this is merely a presumption as these stereotypical representations are oversimplified. Previous research suggests that there is an overlap with regards to recreational and medicinal motives for use (Athey et al., 2017). For instance, relaxation is an important recreational as well as medical motive. Furthermore, the concepts 'high' and 'stoned' are vague and fuzzy, which is typical for constructing symbolic boundaries, in which the characteristics of other groups are vague, while one's own behaviour is nuanced and specific (Copes, 2016). One interviewee stated that recreational users "probably experience other sensations when using cannabis", however she was unable to explain why. Novice cannabis users, in particular, more often had difficulties when explaining the psychoactive effects they experienced themselves and what they presume recreational cannabis users experience. This psychedelic experience, i.e. feeling 'high' or 'stoned', is a typical characteristic of recreational cannabis use in public discourse. Using cannabis for medical purposes is considered a morally legitimate purpose and culturally accepted, while using cannabis for intoxication purposes is not (Pedersen, 2015; Copes, 2016). A part of my sample disassociated themselves from these psychoactive effects and commented that they did not experience



nor pursued these effects, as a justification of their medical use and to illustrate that their use was not recreational.

Self-identified medicinal cannabis users reported experiencing morally accepted effects when using cannabis for medicinal purposes, mainly physical therapeutic effects, such as pain relief. Four respondents made the remark that they might be medicinal users, but that this does not imply that they “*are stoned all day*”. Several participants explained that there were different stages of intoxication. **Jeroen (34)** argued that medicinal cannabis users were not looking to be completely intoxicated, but only to be at ease and relaxed. He acknowledged that medicinal cannabis users might experience psychoactive effects, but that these were less intense compared to the experiences of recreational users. Twelve respondents declared that they felt lightheaded, mellow or more relaxed after consuming certain cannabis products (e.g. low THC levels), but they did not consider these experiences as being ‘high’. These lower levels of intoxication appear to be less stigmatised than feeling ‘high’ or ‘stoned’. It is possible that medicinal cannabis users tend to avoid these latter terms because they are typically associated with recreational cannabis use (Chapkis, 2007). It is certainly plausible that these participants never experienced intense states of intoxication or did not identify these sensations as a ‘high’. However, denying psychoactive experiences and overestimating other users’ psychoactive experiences, might be a way to disassociate oneself from recreational use, as being intoxicated is a stigmatised condition in itself.

Self-identified medicinal cannabis users did not always create symbolic boundaries between themselves and recreational cannabis use(rs), but distanced themselves from the stereotypical representations of recreational cannabis use(rs) prevailing in public discourses. Most respondents in this sample were not opposed to recreational cannabis use and almost half of the sample indicated using cannabis recreationally themselves. **Lode (39)**, suffering from MS, did not feel the need to use a medical argument to justify his cannabis use. However, he kept his use concealed from everyone except his partner. Lode had no experience with recreational cannabis use prior to his medical problems:

*“I could say that I’m using cannabis medicinally because I’m a MS patient, but I don’t think there is a causal link between those two. Once, I started using cannabis because I had problems as a MS patient, but it’s not that I’m still using cannabis because of those problems at this moment. I think it is simply, yeah... to relax for a while, from time to time. To feel a little bit more cheerful, recreationally.”* [Lode/M/39]

The examples of disassociation discussed above are all cognitive coping strategies for resisting stigma. I identified one specific example in my interviews of a respondent who disassociated himself from drug use(rs) in his daily behaviour. **Jonas (25)** who used cannabis for mental health problems, disassociated himself on purpose from the stereotype of recreational users in his daily life, to avoid social disapproval and suspicion from law enforcement. He noted that he had abused cannabis in his past. During this period he had typical dreadlocks and did not take care of his personal hygiene and physical health. In the meantime, he had changed his look and lifestyle on purpose. Physical appearance and health are important dimensions on the basis of which people construct boundaries between types of drug users

(Copes, 2016), since the lack of self-care and hygiene is a typical consequence when dealing with severe drug problems.

*“I used to look like a typical stoned hippy with dreadlocks. Because of this everyone thought instantly, “this guy is using drugs”. If I could choose, I’d still have this look. But how I look now, is just profiling myself on purpose to make sure that people view me as a sophisticated guy. Firstly, this is good for my self-confidence and secondly they will not associate me with drugs. That’s really funny. I can enter a place as high as a kite, they won’t think this because I look like this [laughs].” [Jonas/M/25]*

### 2.3.2 Normalisation

Self-identified medicinal cannabis users who detach themselves from the stigma associated with recreational drug use, underscore at the same time their ‘normality’ by associating themselves with ‘conventional’ individuals. ‘Normalisation’ was another strategy used by my participants to cope with stigmatised feelings and experiences.

Some of my interviewees used a normalisation discourse in daily life in their attempts to convince others that using cannabis was unproblematic. Three respondents asked others if their personality had changed since the start of their cannabis use. They explained to others that they were “*still normal*”, “*not acting strange*” and that they were “*able to function normally*”. Towards the interviewer they also used this normalisation discourse. **Marie (43)**, who lived together with her partner and young son in a terraced house in a quiet middle-class neighbourhood, provides a representative example:

I: “*Your physician, did he support you?*”

R: “*Yes, I’m a normal functioning person. It is not the case that because of cannabis I cannot go to work. Also, if you pass by our house, you will never know it [that she uses cannabis].” [Marie/F/43]*

Five respondents stressed the fact that they were unable to live a normal life without cannabis because of their disabilities. **Anny (58)** and one other respondent noted they could live “*a much more normal life*” now than before when their physical health problems prevented them from living a normal life. Anny, who used cannabis for arthritis pain, negates the harmful impact of cannabis on the cognitive functions of her brain:

*“I know who I am, I have lived a normal life since I use cannabis. A lot more normal than before, because back then I could barely function due to the pain and now I can function normally. I have learned Romanian in a few years, so this means that my mind is still functioning pretty well.” [Anny/F/58]*

A normalisation discourse can be less direct and more implicit. Respondents described themselves as fulfilling their social roles and norms. This was described by Copes (2016) as drug users who emphasise their ability to maintain obligations. Interviewees made the argument more often that they had a job or

have always worked hard before getting disabled, that they took care of their family, were intelligent and functioned normally. **Sandra (42)**, a single mother living with ADHD, said that others supported her use, because she was living a good life and her daughter was a good student. **Carine (46)**, also a single mother, used the argument of being a responsible mother to cope with stigma as well. Other studies show that being a good parent is one of the key boundaries that is used to separate functional from dysfunctional female drug users (Copes, 2016).

*“It’s not because you smoke a joint that you are a gangster, a low lifer, or on the dole. That is something typical: “it will be a dole scrounger”, because someone smokes. I have always worked very hard, never had any debts, I have a house... I’m a very social person, people can ask me anything. My employees have seen my daughter. When she was little and she was sick I brought her to work. So they saw that I’m good with my daughter. Everyone sees that I’m a serious person, but if they would know that I smoke then you’re classified. Then they can even know that you are a good person and that you have your life together, but that will not be taken into account. Because the annoying thing is that soft drugs are automatically linked to hard drugs.” [Carine/F/46]*

Respondents’ narratives about their cannabis consumption patterns encompass a normalisation discourse as well. Several participants explained that their cannabis use was no different from other individuals who take regular medicines. **Jonas (25)** stated that he smoked cannabis to calm down, similar to other people who take tranquilisers or antidepressants. Like other patients, participants used a ‘medicine’ to treat certain conditions, which was considered legitimate medical use. Participants referred multiple times to their cannabis products by using the word ‘medicine’:

*“Every month we have to count our money to be able to buy weed, just to have enough medication. Because that’s what it is, just a medicine. If it works, then it’s a medicine. All the pharma rubbish I tested did not work. Why would those be medicines?” [Jolien/F/25]*

This way, participants might suggest that they were no different from other patients who take conventional medicines. These examples of normalisation are at the same time narratives that contain symbolic boundary work, this time the association with desired groups (Copes, 2016), i.e. ‘conventional’ patients using ‘conventional’ medicines. Interviewees categorised cannabis as a medicine by stressing similarities with other medicines, and distanced it from (illicit) ‘drugs’ by emphasizing their dissimilarities. However, this is where the ambiguity lies, as many participants also dissociate cannabis from conventional medications based on efficacy, safety and side effects. In chapter 5 I focused in on participants’ critical attitudes regarding conventional medicines.

When interviewees described other medicinal cannabis users, some of them argued that they were not “strange” but “normal functioning”, “intelligent” people who “never did anything wrong” and suffered from diagnosable conditions. This is an illustration of emphasizing the positive characteristics of the stigmatised group where one is considered to be a part of (Edland-Gryt et al., 2017). Seven respondents mentioned that cannabis use is common among the general population. This might be a way to cope with stigma by using the ‘everyone does it’ argument. **Sandra (42)**, who was on welfare herself, argued

that almost every student at universities used cannabis, and that she knew lawyers and engineers personally who were cannabis users. Alongside Sandra, two other respondents indicated that “*also*” people from higher social classes used cannabis, to cope with the double stigma associated with the presumed relationship between a lower socioeconomic status and illicit substance use. Other than these arguments, interviewees spoke rarely about other medicinal cannabis users when defending medicinal cannabis use, which might be an indication that medicinal cannabis users do not constitute a ‘drug subculture’.

Similar to the work of Edland-Gryt et al. from 2017 on MDMA users, self-identified medicinal cannabis users did not construct a subculture, but negated differences with other patients so as to be perceived as normal and not marginalised. This way, ‘medicinal cannabis use’ itself is probably not a part of self-identified medicinal cannabis users’ social identity (Hammersley et al., 2001). Since there are currently no clear boundaries between recreational and medicinal cannabis use, people might resist being associated with the deviant sub-group of recreational cannabis users by resisting the medicinal cannabis user identity as well. The term (self-identified) “medicinal cannabis user” might be stigmatizing as such, and as the term does not cover a coherent group it is not a meaningful self-identified social group (Hammersley et al., 2001). Medicinal cannabis users’ identity entails more than their cannabis use. When a particular kind of behaviour is common, normalised and meaningless to the person who exhibits it, it is of little importance for their (self-) perceived identity. Whereas ‘cannabis’ or ‘drug user’ might sound normal, intuitively we sense that this is different for an ‘antidepressant’ or ‘medicine user’ for example. Using prescription drugs is not central to someone’s identity and a ‘medicine user’ is not a socially recognizable identity, as it does not form a relevant nor coherent social group. This might be different in jurisdictions where patients have to register as a medical cannabis patient, by which their cannabis user identity becomes formalised (Newhart, 2013). The perception of medicinal cannabis use was previously limited to a few diseases, including stigmatised health conditions such as HIV/AIDS, and to younger men who have experience with recreational cannabis use. However, cannabis is now used for a wide range of diseases and conditions, by patients with heterogeneous profiles.

### 2.3.3 Claiming self-control

A third way to cope with stigma associated with drug use is by claiming self-control or self-confidence (Peretti-Watel, 2003, Sandberg, 2012). Drug users delineate boundaries between responsible users who have self-control and irresponsible or problematic users, or ‘functional’ and ‘dysfunctional’ users (Copes, 2016). Emphasizing having an unaltered consciousness or a clear mind, can be a neutralisation technique to counteract stigma, as rationality, moderation and self-control are highly valued features in Western societies (Dwyer, 2008). The denial of experiencing certain psychoactive effects was already discussed in one of the sections above. The lack of an altered state of mind was part of the proof of having self-control. Interviewees argued that their use was controlled and did not interfere with their

normal functioning. Several respondents explicitly stated that they use controlled dosages and think they can manage their use well and wisely.

A subset of respondents in this study believed that cannabis was not appropriate for everyone. According to the interviewees, some would not be able to cope with the risk of addiction associated with cannabis use. It appeared that one should have a certain degree of discipline and be a responsible user, as cannabis could be used as an escape from reality. Interviewees noted that people who become easily dependent on psychoactive substances should stay off cannabis. However, among my interview sample multiple interviewees indicated having had alcohol or other drug problems in the past. A number of interviewees (n=5) believed that people who are depressed or vulnerable to depression should stay away from cannabis, since it can provoke or aggravate depressed feelings. However, two respondents, who had episodes of major depression, expressly disagreed with this view, since cannabis helped them to cope with depressed and stressful feelings by its calming effects. Moreover, several participants in this study indicated using cannabis to self-medicate for depressed and sad feelings (n=16).

Four respondents who used cannabis primarily for mental health purposes, identified and labelled their former cannabis use, from when they were younger and before using for self-defined medicinal purposes, as problematic. **Nick (24)** noted that he was a “*junkie*” for three years, when he smoked daily for recreational purposes and for sleep problems. **Jonas (25)** said that for several years he smoked 15 to 20 joints per day as a form of self-medication for mental health problems. He ended up in drug treatment where he learned to use cannabis for medicinal purposes responsibly. **Armand (50)**, living with Tourette Syndrome and ADHD, explained that he misused cannabis in the past because he was constantly high. The periods of which respondents thought their cannabis use was problematic were also characterised by difficulties in other aspects of life (e.g. neglecting responsibilities). Since they started “using cannabis medicinally” they thought that their health as well as other problems improved. They reframed their cannabis use in a medical framework and adapted their cannabis use patterns, by using lower dosages of cannabis. None of them thought that their current medical use was problematic. In these descriptions the participants disassociated themselves from their own previous lifestyle (Pedersen, 2015) and non-medical cannabis use from the past, which was considered bad and hazardous. Similar to the work of Järvinen & Demant (2011), these retrospective expressions help to understand their own behaviour and to demonstrate the genuineness and legitimacy of their current medical use.

#### 2.3.4 Comparison of risks

Finally, comparing the risks of different types of drugs are commonly used cognitive strategies to deny the risks and gain acceptance for the use of a particular drug (Peretti-Watel, 2003; Pedersen, 2015). In the interviews, the health risks of cannabis were mostly compared to those of conventional medicines to illustrate its (relative) safety.

Multiple respondents argued that nobody has ever died from using cannabis and they believed that a fatal overdose resulting from using cannabis was impossible (n=14). At the same time, participants emphasised that this was not true for other (therapeutic) psychoactive substances (e.g. opioids). While, six respondents believed in the impossibility of overdosing with cannabis, others argued that a cannabis overdose only induced minor consequences (e.g. headache, drowsiness, falling asleep, etc.).

Many respondents were convinced that cannabis is not addictive, or less so than other illicit and licit drugs. A few respondents stated that they were addicted to their cigarettes (tobacco) and not to cannabis. According to my participants, the use patterns of smoking cannabis were different from and less harmful than smoking regular cigarettes with tobacco. They declared that smoking cannabis involves taking a puff once in a while and putting it away, whereas a cigarette is smoked in one go and much faster, one after the other. Multiple interviewees appeared to think that the most unhealthy part of smoking cannabis was the tobacco added to it. They argued that tobacco was the substance damaging the lungs and causing individuals to crave smoking cannabis.

Many respondents believed that cannabis is a safe product that cannot cause major problems (e.g. “*as innocent as sage or mint tea*”). Experiencing certain side effects due to cannabis was attributed to using cannabis the wrong way or for the wrong purposes. Some participants thought that cannabis could not be harmful, because of the human endocannabinoid system. Cannabis was described as a substance of mother nature that has been around for many years. As several respondents noted “*A plant mother earth gave us for a reason so why not use it?*” and “*How is it possible to forbid an innocent plant?*”. Sandberg (2012) wrote that many of their participants used the phrase “*It’s just a plant*” to downplay the possible risks. Many of my interviewees used this same sentence. In the previous chapter we saw how this ‘green argument’ was contrasted with the ‘chemical’ attribute of conventional medications, to illustrate cannabis’ safety and efficacy. Medicinal plants are assumed to be safe and superior to synthetics by their consumers, because they are ‘natural’ and they have a close connection with our roots. However, this assumption is not based on scientific evidence (Karimi et al. 2015). The narrative of **Niels**, whose mother was addicted to prescription drugs and suffered from severe mental health problems, is a good example of interviewees’ responses:

*“All the things that I have seen caused by medicines..., you can give me all the plants in the world to smoke, those things will never happen to me, so to speak. I’m done with medicines. Even for tooth ache I won’t touch them. I’m totally pill free, I’m happy with it. I don’t know what they throw in those pills, but in my eyes it is filth. Everything synthetic, you can’t say that this is still healthy for humans. Something that is not biological or not coming from nature can be harmful for human beings.”* [Niels/M/28]

Multiple respondents brought up that other psychoactive substances (e.g. alcohol, coffee, sugar, tobacco, etc.) are not less harmless or risky than cannabis. First of all, cannabis was considered safer and healthier than conventional medications (e.g. hypnotics, analgesics, etc.). Interviewees noted that other people took medicines “*as if they are candy*” without serious thought. Next, cannabis was considered distinct

from other psychoactive “hard” drugs (e.g. heroin, speed, etc.).<sup>43</sup> In this respect, six respondents mentioned spontaneously that the gateway theory was nonsense.

In the majority of the interviews respondents compared cannabis spontaneously with alcohol, related to the risks associated with both substances. Many respondents claimed that alcohol is equally or more harmful than cannabis (cf. Peretti-Watel, 2003). Respondents had witnessed themselves the damage that can be caused by the consumption of alcohol (e.g. alcohol-related death). Interviewees argued that while alcohol consumption triggers aggression and leads to fights, cannabis does the opposite and serves as a “peace pipe” since people become more relaxed. Next, interviewees explained that the intoxication experiences caused by alcohol and cannabis were incomparable. Respondents spoke of cannabis enriching the mind while alcohol caused impoverishment.

Based on the arguments listed above the interviewees could not grasp and expressed outrage why cannabis was an illegal condemned ‘drug’, and substances equally or more harmful were socially accepted, normalised and unquestioned only because of their legal status. Interviewees referred to the false socially constructed dichotomy between illicit and licit psychoactive substances. As multiple participants noted “*being hammered all the time is no problem*”.

*“They hear cannabis, and immediately the word ‘drugs’ comes up. While, if people would think for once, alcohol is a hard drug... If I buy a bottle of vodka and I drink it bottoms up. I will be lying down dead here on the floor within fifteen minutes. There is nothing illegal about that, and it’s totally allowed.” [Philip/M/41]*

When defending their cannabis use, the interviewees argued that alcohol, tobacco and medicines in particular were also ‘drugs’ or even ‘hard drugs’. Respondents referred to the hypocrisy of the Belgian drug policy and emphasised the need for consistent approaches and regulations.

*“I gave cannabis to a cancer patient, in the form of oil, against being sick from chemotherapy. It helped incredibly well. First, she absolutely did not want to use it, because “it is a drug”. Then I responded “Do you really think that all the other things that are pushed inside you, that those aren’t drugs?!” [Anny/F/58]*

In the previous chapters we saw that many participants perceived cannabis as highly efficacious, and thought it was beneficial for multiple aspects of their lives. Positive experiences are perfectly possible. However, people may exaggerate the positive impact of cannabis to justify their use. They also referred to scientific studies which provide promising results for cannabis use in treating severe conditions. Participants might trivialise cannabis or downplay its risks while boasting about its therapeutic potential at the same time, to counteract stigma (Sandberg, 2012; Sznitman & Taubman, 2016).

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<sup>43</sup> See also PART IV Empirical results: Chapter 4 section 2.6.1 Cannabis versus other illicit drugs

## 2.4 Disclosure versus staying anonymous

The stigma associated with cannabis affects self-identified medicinal cannabis users' decision on disclosing their medicinal use. When interviewees were asked if they were open about their cannabis use, a frequently recurring answer was that they were open and honest but “*did not trumpet about their use*” (n=17). Several participants regretted the fact that they could not talk freely about medicinal cannabis use and were forced to secrecy and self-censorship due to professional, social and legal reasons.

Most respondents chose to reveal their medicinal cannabis use to their relatives and friends. When disclosing their cannabis use it gave them the opportunity to explain and justify their use. Participants decided to disclose their use based on the expected reactions of others. Some believed it was important to carefully select the individuals with whom medicinal cannabis use is discussed. A few noted that in particular older generations were not open to medicinal cannabis use, because they were raised in a culture of prohibition. More often, when participants were employed they kept their use hidden from clients, and did not disclose it at their jobs or told it only to certain colleagues. **Katrien (45)** who was self-employed, concealed her cannabis use in work-related contexts in order to keep her chronic conditions a secret. She believed that the view of being chronically ill could be detrimental to her job, while she was still perfectly able to work.

Some participants noted that they preferred not to talk about their use because of the taboo and possible stereotypical reactions. Few participants kept their cannabis use completely concealed from their own social circles (e.g. parents or partner), because of fear of disapproval. **Liesbeth (56)** concealed the fact that she used CBD oil for neuropathic pain from her husband by only taking it when he was not around. She believed he would never understand nor accept it, because of the many problems their son went through due to his cannabis use. **Lode (39)**, an MS patient, did not tell his parents about his use, because his brother had problems with other drugs and he did not want to worry his parents. It happened more often that interviewees kept their use hidden from their parents, because of their negative attitudes.

Self-identified medicinal cannabis users were discrete about their use and decided not to trust everyone in order to stay under the radar of the police. Two participants mentioned that opening up could destroy their lives when people had bad intentions. Interviewees who cultivated cannabis at home were in particular mindful to avoid criminal charges. Measures were installed to prevent outsiders from detecting their cannabis plants (e.g. ventilation systems, sound dampers, air fresheners, carbon filters, etc.).

Many participants avoided using cannabis in public spaces and had to adjust their cannabis treatments correspondingly. For instance, when **Anny (58)** went on holidays she no longer brought cannabis with her, because strangers had criticised her in the past. Participants had to take measures to hide their use from the public, for instance by hanging air fresheners in apartments to cover the smell. In this context, multiple interviewees found it also important not to bother others with their use. Most of the participants who consumed cannabis publicly turned to discrete administration methods (e.g. cannabis oil), which is



an example of norms and etiquette employed by drug users to avoid drawing attention to their use (Bottorf et al., 2013).

Most interviewees used cannabis when they were at home. Since cannabis products for medicinal purposes are not allowed in Belgium, it is obviously not permitted to use them at work. This means that employed participants had to switch to other medicines or stay abstinent during work. While two employed interviewees used cannabis during work, the majority never did so when they had to go to or were at work. One of them was **Tom (37)**, who had worked in a government agency. At this job, he relied on analgesics to alleviate pain during work time. However, due to the adverse effects of these medications, he was forced to quit his job.

#### 2.4.1 Participants' openness towards their children

Whether self-identified medicinal cannabis users disclosed their use to their children depended on their age (Page & Verhoef, 2006). Most interviewees with older children were open towards them about their use. Young children were most of the time not aware of their mother's or father's cannabis use, because they were too young to understand. Respondents stated that their children were aware of the fact that they were taking medicines. However, those medicines were not labelled 'cannabis', but they received less specific descriptions, such as "*(magical) drops*", "*herbs for pain*" and "*cigarettes for pain*". **Sophie**, a mother of two young children and who vaporized cannabis for pain, said:

*"We are very open about it towards the kids. We don't pronounce the word cannabis, but the kids call it the magic flute [vaporizer] that can't whistle, but makes mommy better. The plants in the garden, about those they say "flowers that make mommy better"."*  
[Sophie/F/37]

In all other cases respondents kept their use totally secret from their young children. Two respondents thought it was important in the interests of their younger children to be discrete about their cannabis use. They wanted to avoid their children becoming victims of their parents' deviant behaviour, as illustrated in the following quote:

*I: "Do you keep it a secret from your children?"*

*R: "That's the annoying part. When a teacher at school knows that I use it at home, and you are unlucky that this person thinks this is a big deal, then it is as if my son lives at home with a drug dealer. Some people draw conclusions immediately, they label you. While in his class, of the twenty of the dads, maybe three are alcoholics who drink themselves to death every evening. But yeah, that's alcohol and that's accepted. While this [cannabis oil], my children don't notice anything of it. If I were to take drops from a legal bottle they wouldn't notice a difference. I hope when they will get older, there will be a breakthrough. That it will come out of marginalisation and that I can be honest about it. I now call it 'medicines' or 'drops'."* [Thomas/M/35]

### 2.4.2 Medical cannabis activism

A subset of interviewees participated actively in discussions on medicinal cannabis use on social media and other online fora (e.g. sharing their experiences and expertise). Other participants decided to remain anonymous or low profile on social media and other websites for social and legal reasons. **Thomas (35)**, a middle class father of young children and who worked as a consultant, did not ‘like’ or ‘follow’ certain pages on Facebook because he wanted to avoid other people from his digital network seeing this. **Sandra (42)** in turn used a nickname on social media to stay under the radar of the police. Her online profiles were filled with information on medicinal cannabis and calls to legalise it.

A number of participants appeared not to be concerned about divulging their cannabis use. In multiple interviews, respondents said that we could disclose their names in the context of the study. As **Maarten (37)** cites: *“In the end I don’t care. For all I care you can proclaim to whoever you want that “the man in the wheelchair uses cannabis.”*” For them it was unnecessary to keep their identities anonymous and some even wanted to be publicly known for their medical cannabis use in their fight for the legalisation of medical cannabis. Respondents thought that it was important to share their stories in daily life to break the taboo and to increase the awareness of medicinal cannabis use. A couple of the interviewees (n=9) had spoken in public about their use through different (national) media channels, including YouTube, magazines, newspapers, TV, radio, online blogs and websites. Bone and colleagues (2018) argue that in most countries the call for change in medical cannabis regulations comes from below, by civil protests. In Belgium, citizens also push the (medical) cannabis movement. Some of the interviewees can be called ‘medical cannabis activists’ and were well-known within the Belgian ‘medical cannabis community’. They fight for the access to medicinal cannabis by giving public testimonials, signing petitions, and by taking part in demonstrations, charity events and peer gatherings of medicinal cannabis users. Two interviewees wanted to be activists, but did not act because of possible legal, social and professional ramifications.

### 2.4.3 Recommending cannabis to others

Many respondents have advised or recommended cannabis to friends and family who were confronted with health problems, and for whom interviewees believed cannabis could be beneficial. Overall, this advice was well-received. However, it happened that others were too afraid or resistant to try cannabis. **Helena (60)**, living with cancer, argued that her father, who had cancer as well, always refused to try cannabis:

*“My father died two years ago because of cancer. Back then, I said he also had to start with cannabis, but he never wanted to. Only at the very last moment, just before he passed away and when the general practitioner was present. In his presence I asked my father “so, are you planning to use the cannabis?”. The practitioner said, “yes, why not?”. But yeah, if someone is almost dead, then they think, what does it matter anyway? I think it’s ridiculous, morphine is allowed, why should cannabis not be allowed?” [Helena/F/60]*

Several interviewees knew people close to them who might benefit from cannabis, but to whom my participants did not recommend cannabis because they were opposed to it. **Louise (29)** did not discuss the option of using cannabis with her boss who was going through chemotherapy, because of her negative attitudes. She believed physicians were better placed to give this kind of advice. Also several other participants believed that they were not in the right position to give advice on medicinal cannabis use, and believed physicians should take this upon themselves. Interviewees never compelled others to use cannabis, but mainly shared their own positive experiences and knowledge.

Many respondents can be seen as ‘lay carers’, since they bought or shared their own cannabis products (e.g. own harvests and self-made oil) with friends and family who used them for therapeutic purposes as well (e.g. cancer patients) (n=23).

## 2.5 Social support and stigmatised experiences

Generally, interviewees’ own social circles had positive attitudes towards their cannabis use. Interviewees stated that their relatives and friends accepted their cannabis use, because they noticed a difference between prior and after the initiation with cannabis. Loved ones were glad that their partner or family member found a solution for his or her condition and were no longer suffering. Several respondents stated that their partners encouraged them to take cannabis when they noticed they were suffering. The fact that cannabis use was mostly accepted and integrated in participants’ inner circles, is clear from the fact that many respondents (n=25) had someone among their loved ones who used cannabis (for medical purposes) as well, mostly partners, children and parents.

Although most respondents received social support overall, several interviewees stated that others “*did not applaud their use*” and mostly tolerated it. Some respondents were confronted with teasing comments or stereotypical reactions, but not severely.

*“My son-in-law bullied me a little bit. He drove by my house and said “boy, it smells like weed out here” or “granny is constantly high.””* [Rosa/F/63]

Some respondents I interviewed experienced difficulties with some of their intimates due to their cannabis use. More often, parents were not pleased with the fact that their child used cannabis (n=11). A few participants had to deal with social disapproval, which led to serious consequences for some. Other people reacted negatively because the participant was using ‘drugs’, consequently interviewees received labels such as “*a druggie*”, “*trashy people*”, “*drug user*”, “*junkie*” and “*hippie*”. Three interviewees noted that if the word cannabis comes up, it is directly linked to ‘drugs’ and ‘drug abuse’. Four respondents’ partners were opposed to cannabis, which led to serious conflicts (e.g. break-ups). One of them, **Niels (28)**, who used cannabis for mental health problems and worked as a construction worker, had problems with his partner because of his cannabis use, but also at his job. He recounted that from the moment his boss knew about his use, he received the label of a ‘junkie’ and he had to do all

the dirty chores. **Jonas (25)**, who has had psychological and social-economic problems since he was a child, was confronted with social stigma:

*“I have heard many rumours about me. I was dead, a hobo, on heroin, etc. I had to hear it from my sister, mom, people from my hometown... Only because I looked like this [i.e. dreadlocks, alternative style of clothing (‘hippie’)]. But the only thing that I did was smoking joints. I have experimented with it [illegal drugs], but I never had any problems with any of those.” [Jonas/M/25]*

**Jolien (25)**, suffering from MS, received negative responses from her neighbours. She defended her use by referring to the formal support she received from her general practitioner:

*“In the hallway of our apartment building, the upstairs neighbours had put up a paper with: “Please don’t use weed and other drugs, and please limit the cannabis odour, because otherwise we will take action.” Other neighbours put a note under our door that said that they didn’t want junkies next to them. So, next to the paper in the hallway I put up a prescription from my doctor and wrote next to it “Please, I get cannabis prescribed, you’ve got nothing on me.”” [Jolien/F/25]*

Similar to respondents who first had negative attitudes about cannabis themselves, some of those relatives turned around after a while.

Four respondents said that other people had questioned the medical need for their use and the genuineness of their diseases. **Nadine’s (61)** son did not believe that she was ill and thought it was an excuse for her to use medicines, including cannabis. Nadine used cannabis to relieve the symptoms of fibromyalgia and spasmophilia. In other cases, people were sceptical or did not believe in the therapeutic efficacy of cannabis. Participants thought that the reason why this widespread disapproval existed was the fact that the majority of the general population were ill-informed. The wrong image and prejudices about cannabis would be the result of fake stories and fearmongering propaganda. Participants regretted the fact they had to defend and justify their use.

*“My parents believe that it takes the pain away a bit, but they can’t believe that it does this much. When I want to explain it, they call me a filthy hippy. Someone who is way too naive and believes myths on the internet, while they are just narrow-minded and too naive to believe everything they learned in their schoolbooks back in the days.” [Ine/F/30]*

When asked what participants thought of others’ attitudes towards their use, many self-identified medicinal cannabis users responded that they did not take others’ opinions to heart or said this was none of their business. **Danny (55)** developed this “*je m’en fous*” (‘I don’t care’) attitude from the moment he was diagnosed with cancer. Four respondents stated that individuals who condemned medicinal cannabis use “*should take a look in their own medicine cabinet*”. They believed it was absurd that using strong medicines daily (e.g. tramadol) would be perceived as normal whereas using cannabis would not.

## 2.6 Legal concerns and ramifications

The regulations on cannabis in Belgium can be unclear because of the coexistence of different types of legislative documents and ministerial guidelines. Several respondents had misconceptions about the current Belgian cannabis policy. Some respondents were convinced that it was legal to possess and cultivate one cannabis plant, while this is only tolerated by law enforcement, and thus it remains illegal by law. Other participants were aware of the Belgian ‘tolerance policy’ and of the risks when possessing or cultivating cannabis. Therefore, multiple participants called for clear and less restrictive regulations.

The majority of participants in this study have never been in touch with the police because of violations related to cannabis. Eleven interviewees got in trouble with the police because of cannabis-related offences, nine of them for cultivating cannabis. They were prosecuted and their plants were confiscated. Three of them were sent to prison for short sentences. Reasons for how they got caught varied, including detection of cannabis seeds in the post office, others informed the police, in the context of a criminal investigation to a grow shop, etc. A couple of participants (n=5) were arrested for reasons other than cultivating cannabis, including dealing, the possession and the import of cannabis. Three respondents claimed that their trials were dismissed because of the medical purpose of their use. Another interviewee said cannabis abstinence was not one of the preconditions imposed by the judge because of his medicinal use.

Results regarding participants’ concerns with regard to the illegal status of cannabis were mixed. While some respondents expressed few concerns regarding law enforcement, others felt uncomfortable about their illegal activities. Multiple respondents were uncertain about the question if they were afraid of law enforcement and possible criminal charges, and provided inconclusive and ambivalent answers. Some respondents argued that if they were to get caught by the police they would stand their ground and were willing to fight in public to defend their case (n=8). Other respondents went even further by claiming that they were willing to be confronted with the police or judiciary to facilitate discussion on the legalisation of medicinal cannabis. Interviewees argued that a confrontation with the police would not stop them from using cannabis. **Lode (39)** expected understanding from law enforcement because of his health problems:

*I: “Are you ever afraid of the police?”*

*R: “Yes and no ... I would definitely not like it if they would bother me with it. But then again, I’m an MS patient. I hope they also have a bit of understanding that I have been trying out those things to see if it helps. I will certainly not be the only MS patient who uses cannabis.” [Lode/M/39]*

Three participants had tried to open the debate about medicinal cannabis use by informing the police about their (home-grown) cannabis. **David (39)** approached the local police on his own initiative to explain that he was going to cultivate two cannabis plants and that he was a medical patient. He told the police officer at the front desk that they could come and check that he did not have a cannabis plantation at his home, and that he needed cannabis for medicinal purposes and not to make profit. The police officer almost fell from his chair after hearing his story and David was advised to walk outside. The

officer said he was going to pretend he had not heard David's story, since cultivating cannabis is a criminal offence in Belgium. He explained that if the police drug unit were to find out about the cannabis plants, David would face serious consequences.

Respondents who were afraid of law enforcement, were mainly worried about legal, professional, financial and social ramifications for themselves and their families. Participants who cultivated cannabis were in particular more concerned. Concerns regarding law enforcement affected participants' daily lives. **David (39)** who struggled financially due to his health problems was most concerned:

*"I have nightmares about it. It's constantly on my mind, "what if they catch me?" Because I have already that much misery physically, and the invalidity. Plus all the costs, and I don't have a lot of money. You won't get heavily punished, but it is going to cost a lot of money, because they take it all from you, your tent, lamps, etc. And your neighbours they are going to think "what's going on?" Because, before you can explain it, they already see a police car being loaded with all your stuff. Then you are a 'drug grower' and you don't have the opportunity to explain it right away. So that is something that stays in the back of my mind all the time."* [David/M/39]

A number of participants in this study possessed a 'doctor's certificate' which said that their cannabis products were needed for medical purposes. These certificates were most of the time unofficial documents downloaded from the internet. The document provided space for the patient's personal details, medical conditions, use patterns and the signature of a physician. Several participants considered this certificate or a doctor's official prescription as a (legal) protection if they were to be confronted with law enforcement. They felt less or unworried about criminal charges because of the formal support from physicians. **Philip (41)**, suffering from tinnitus, visited a psychiatrist from another province once per year to obtain a prescription for cannabis. However, he never used it since he cultivated cannabis himself. He wanted the prescriptions in order to have proof of his medicinal use. Having a prescription and buying cannabis in a Dutch pharmacy also felt more 'legal' than buying it from other sources (e.g. a dealer). However, one respondent noted that the certificate that he received from his physician was "*a certificate and at the same time not a certificate*", because this document did not allow him to drive.

### *3. Discussion*

The findings on social acceptance and social and internalised stigma among medicinal cannabis users are similar to results from previous studies (see Bottorf et al. 2013; Satterlund et al., 2015).

The survey results show that most self-identified medicinal cannabis users disclose their use to important people in their lives. However, there is still a subpopulation of self-identified medicinal cannabis users who conceal their use from at least some people. Cannabis is more often not disclosed at work and to strangers. Multiple participants concealed their use because they were afraid to lose their job. This explains why people hide their use from colleagues and employers. Hiding cannabis was mainly driven by motives related to stigma, i.e. to avoid judgements, fear that people will disapprove of their use, and the belief that it is a private matter. Self-identified medicinal cannabis users also hide their use to prevent criminal charges, a consequence of the current illegal status of medicinal cannabis use in Belgium. However, law enforcement did not seem to affect my interviewees' decision about whether or not to use cannabis. All of the interviewees who got in trouble with law enforcement because of cannabis-related offences were not deterred by it and did not stop their use. Individuals who were arrested for cultivating cannabis, only quit cultivation and sought other access modes. When medicinal cannabis is properly regulated it can reduce stigma and users' concerns regarding criminal charges.

The survey results show that perceived social support was relatively high and that the minority of self-identified medicinal cannabis users receive solely negative responses from their inner social circles regarding their cannabis use. However, a significant part of the survey sample received negative as well as positive feedback from their family and friends (cf. Leos-Toro et al., 2018). The interview data reflected the survey findings. Most interviewees' cannabis use was accepted by important people in their lives. A few interviewees recounted anecdotes of negative attitudes from others. However, for some the stigma associated with cannabis had far-reaching consequences. Survey participants who used cannabis only for medical purposes rated the reactions from family as more positive than did people who have a history of non-medical cannabis use. One possible explanation might be that recreational purposes for use are more stigmatised than medical motives.

Self-identified medicinal cannabis users' narratives reveal the stigma associated with medicinal cannabis use in Belgium. I detected internalised stigma among self-described medicinal cannabis users through participants' behavioural and cognitive strategies to cope with stigma (cf. Pedersen & Sandberg, 2013). Cognitive strategies included: neutralisation techniques, normalisation discourse, downplaying the risks and emphasizing the benefits of cannabis, claiming self-control, and symbolic boundary work by scapegoating recreational cannabis users. Behavioural responses to stigma included: secrecy, discriminative disclosure and using discrete administration methods. Previous studies reveal similar coping responses among (medical) cannabis users (Peretti-Watel, 2003; Bottorf et al., 2013; Pedersen & Sandberg, 2013).

When medicinal users explained medicinal cannabis use by discussing its differences from recreational use, they drew a line between them and the stereotype of recreational cannabis use(rs). Medicinal cannabis users in this study described their identity and behaviour as appropriate, while the abstract and vague out-group of recreational cannabis users and other drug users, was described as inappropriate (Copes, 2016). A number of participants portrayed this out-group with familiar cultural narrative identities (Copes, 2016) such as ‘junkies’, ‘addicts’ and ‘stoners’. We saw that interviewees brought forward a stereotype and caricature of other (recreational) cannabis users. They described them mostly as “*people who want to get high*”. Interviewees referred to this stereotypical profile when they were talking about recreational cannabis users in general and not about a specific person who they personally knew. At the same time, many of my interviewees had a nuanced understanding of recreational cannabis use. They do not condemn all other types of cannabis use and can even understand why people use cannabis for non-medical purposes, as some of them do it themselves, but they distance themselves from the current stereotype of cannabis use prevailing in public discourse.

Not all interviewees identified themselves explicitly as a ‘medicinal cannabis user’. Sandberg wrote in 2012 that cannabis users described their user identity simultaneously as normalised but also belonging to a subculture. They used risk denial techniques to justify their use. In my interviews, participants used a normalisation discourse as well as neutralisation techniques as a response to stigmatisation (Sandberg, 2012). The subculture discourse was less prominent in the context of defending medicinal cannabis use. Based on my findings I assume it is less likely that medicinal cannabis users belong to a drug subculture, since it is a heterogeneous population who emphasise the similarity of their identities, norms and values with those of conventional patients.

The meaning of medical cannabis use is constructed through the interaction of dominant cultural narratives and personal narratives. Through symbolic boundary work the concepts ‘medical’ and ‘recreational’ can be defined in particular ways by users to avoid stigmatisation (Sandberg, 2012). In this respect, it is important to prevent medicalisation of cannabis use because of coping mechanisms for stigma. People who use cannabis for ‘non-medical’ purposes and who label their own cannabis use as ‘medicinal’, might do this as a strategy to cope with stigma. However, most interviewees in this study were suffering from severe diagnosed health problems. It would be incorrect to question the genuineness of these medical conditions and to minimise the medical necessity. This does not mean that particular behaviours have to fit in one of the dichotomous categories. A more accurate representation of self-identified medicinal cannabis users’ motives for use would be an interwoven spectrum of motives or a continuum from recreational to medicinal cannabis use as suggested by Reinerman et al. (2011).

This chapter and previous ones illustrate the ambivalent position of cannabis in a medical context. Interviewees differentiated cannabis from conventional medicines, by giving the latter the ‘chemical’ label and attributing to them adverse effects. At the same time, interviewees associated cannabis with conventional medicines and they rejected being perceived differently from patients who take conventional medications or undergo conventional treatments. In addition, while many were only interested in consuming whole plant cannabis products, other medicinal cannabis users prefer to



consume pharmaceutical cannabis-based medicines. These ambivalent attitudes towards cannabis arise probably from its unique and versatile position as a medicine, nutrient, wellness- and recreational drug.

Our interviewees used multiple techniques as a coping mechanism for stigma, one of them was the comparison of risks between different types of drugs (Peretti-Watel, 2003; Sandberg, 2012). Although participants might emphasise the safety of cannabis out of coping motives for stigma, this does not necessarily mean that their claims were unfounded. Firstly, participants were right when claiming a fatal overdose of cannabis is unlikely, because until now there is no scientific evidence that cannabis has ever led directly to lethal consequences. Secondly, psychoactive substances are currently divided into two categories based on their legal status. These classifications of illegal and legal drugs are socially constructed and more or less arbitrary, as they are not based on their safety or health risks, but instead moral beliefs and historical developments form their basis (Coomber et al., 2013). For instance, research suggests that cannabinoid treatments could become safe substitutes for opioids (Lucas et al., 2019). Taking a critical stance towards the risks of legal and illegal psychoactive substances is needed. As Coomber et al. (2013) wrote, people are more likely to perceive medicines as safe only because they are legal.

When a drug is used medically, i.e. in accordance with the prescribed dosage and purpose of use, it is less stigmatised than using the same substance non-medically (Copes, 2016). Rudski (2014) found that medicinal cannabis use was more stigmatised when administration methods resembled recreational use (e.g. joints) and less stigmatised when resembling conventional medication (e.g. pills) and when treating more severe illnesses. Among my interviewees the administration method of smoking appeared to be associated more with recreational cannabis use. Self-identified medicinal cannabis users' own narratives contribute to the acceptance of cannabis since most of them use a medical terminology that is free from concepts typical to the recreational cannabis culture, which increases the conceptual distance between the two types of use (Rudski, 2014). The study of Lewis & Sznitman (2017) shows that personal testimonials of medicinal cannabis users with non-stigmatised illnesses in particular can promote public support.

It is noteworthy that the substance itself does not determine if it is normalised or not, but the context does; this includes how, when and where it is used (Hammersley et al., 2001). For instance, drinking alcohol at work or while driving, is not accepted and stigmatised. In the case of cannabis we are currently facing a transition, as cannabis is commercialised in medical as well as non-medical contexts in different parts of the world. It remains the same substance, but mainly attitudes and the contexts have altered. As Mary Douglas (1978) noted '*a drug is a chemical which is in the wrong place at the wrong time*' (Coomber et al., 2013). Since the start of the re-medicalisation (Taylor, 2010) and commercialisation of cannabis, cannabis appears to be in the right place at the right time. Whereas the drug cannabis previously was stigmatised as such and consequently also all its users, we see now a shift towards the acceptance of the substance in certain contexts. The acceptance of medicinal cannabis use continues to grow, but also recreational use is more accepted, as countries are moving towards less strict regulations on recreational cannabis use.

In addition to the importance of scientific support, the removal of stigma around cannabis is essential for it to become a fully-fledged treatment. Currently, people are obstructed by the stigma associated with cannabis use. We saw that novice medicinal cannabis users experienced hurdles when using cannabis for the first time. Multiple inexperienced participants encountered personal, legal and social barriers to initiating cannabis use. If cannabis treatments remain stigmatised, it can discourage people who might benefit from cannabis from using the substance therapeutically. Some people might decide not to use it, and other people will only start using it unnecessarily late, which might be a loss with regards to quality of life improvement.

## PART V

### General conclusions

#### Introduction

This is -to our knowledge- the first study on medicinal cannabis use in Flanders (Belgium). There is no literature available on the sociodemographic characteristics and patterns of cannabis use of Belgian medicinal cannabis users. Few user studies examining individuals using cannabis for self-identified medicinal purposes have been conducted in the European context. Although cannabis use for therapeutic reasons can be traced back to the times before Christ, it is now becoming more popular and widespread among the general population (de Hoop et al., 2018; Lucas, 2012). This means that medical professionals and policy makers need a thorough understanding of medicinal cannabis users' (clinical and demographic) profiles, experiences, motives for use and cannabis use patterns. This study provides in-depth descriptive information on these topics, collected with complementary methods, including qualitative (in-depth interviews) and quantitative methods (an online survey). This thesis attempts to present a comprehensive picture of self-identified medicinal cannabis use, an emerging and complex phenomenon. The main objectives that guided this study are: (1) *“explore the meaning of medicinal cannabis use and its conceptual boundaries with recreational cannabis use”*, (2) *“describe the profiles, opinions and experiences of self-defined medicinal cannabis users”* and (3) *“identify internal and external stigma among self-identified medicinal cannabis users”*. The findings on self-labelled medicinal cannabis users' experiences with and attitudes towards recreational and medicinal cannabis use contribute to the currently limited literature available on the overlap between the two types of use (Newhart, 2013; Lankenau et al., 2018; Athey et al., 2018; Reinerman et al., 2011; Dahl & Frank, 2011; Bakalar & Grinspoon, 1997; Chapkis & Web, 2008). Despite the study's methodological limitations, my findings are consistent with previous studies regarding medicinal cannabis user profiles, motives for use, perceived efficacy, patterns of use, social acceptance and stigma, thereby supporting the validity of this study. This suggests that the present findings might be generalizable to self-identified medicinal cannabis users outside of the current study sample.

This final chapter elaborates on the key findings drawn from the data analysis. It discusses and summarises the conclusions in detail, in relation to the study's objectives. This concluding chapter focusses on the study's contributions to the extant literature. The presentation of the main findings is structured as follows: first, self-identified medicinal cannabis users' profiles are discussed. Second, I reflect on the meaning of medicinal cannabis use, by focussing on the symbolic boundaries constructed between recreational and medicinal cannabis use by self-described medicinal cannabis users themselves.

## PART V General conclusions

Delineating symbolic boundaries is functional for medicinal cannabis users who seek to avoid stigma. Next, recreational cannabis use and medicinal cannabis use are compared regarding use motives and patterns. Finally, the 'high' is discussed, since it appears to play an important role in the constructed distinction between recreational and medicinal cannabis use. This chapter then continues by identifying some of the limitations of the present study and indicating how these could be tackled in further research. I then offer recommendations for practice and policy with regards to regulating cannabis for medicinal purposes. To conclude, this chapter ends with final remarks which include the most important take-away messages.

## 1. Medicinal cannabis users' profiles

My findings suggest that self-identified medicinal cannabis users are a highly heterogeneous population that differs from the general population regarding their higher rates of illicit drug use, lower rates of employment and lower incomes. These last two disparities can be partly explained by the higher levels of disease and disability. Self-described medicinal cannabis users report higher rates of lifetime illicit drug use, however most of them had ended the use of illicit drugs apart from cannabis.

Self-described medicinal cannabis users suffer from diverse chronic comorbid conditions and symptoms which they treat with cannabis. This study was one of the few studies in which participants were able to select symptoms and conditions from very extensive lists. As a result 55 different conditions and 61 different symptoms were reported. The therapeutic use of cannabis for multiple symptoms and conditions by one individual is the norm (cf. Swift et al., 2005; Lucas, 2012). Many self-labelled medicinal cannabis users use the substance for a mix of physical and psychological health purposes. The most commonly reported health problem among the study sample is chronic pain, followed by sleep problems and depression, echoing previous research findings (Swift et al., 2005; Hazekamp et al., 2013; Lintzeris et al., 2018). Since chronic pain is a complex phenomenon and difficult to treat (Chen & Michalsen, 2017), patients seek alternative treatments such as cannabis. The immune-mediated disease multiple sclerosis is reported by almost six percent of the total sample. This is currently the only condition for which the use of a cannabis-based pharmaceutical medicine is approved in Belgium (FAGG, 2017). Spasms and neuropathic pain in MS are one of the few indications for which there is conclusive scientific evidence on effectiveness and safety (Whiting et al., 2015; Allan et al., 2018; Kowal et al., 2016; Patti et al., 2016). The use of cannabis and cannabinoid medicines as a treatment for the vast majority of the most frequently cited medical conditions by this sample is, so far, not supported by scientific proof (Whiting et al., 2015; Allan et al., 2018) and not medically approved in Belgium.

Consistent with other studies (Lucas et al., 2016; Lucas et al., 2013; Lucas & Walsh, 2017; Lucas et al., 2019; Grella et al., 2014; Piper et al., 2017), I found that recreational as well as medical substances are substituted with cannabis. Self-identified medicinal cannabis users indicate reducing their conventional medicines because of the use of cannabis (cf. Zaller et al., 2015). In line with other studies (Swift et al., 2005; Zaller et al., 2015; Walsh et al., 2013; Boehnke et al., 2019; Boehnke et al., 2016), cannabis is perceived to be highly effective and more effective than conventional medicines, while causing fewer adverse effects. However, cannabis is not described as a panacea by medicinal users, and more often they undergo conventional treatments concurrently with medicinal cannabis use. The fact that self-identified medicinal cannabis users report a reduction in alcohol consumption, might mean that the substances are used for similar purposes and/or induce similar intoxication experiences desired in everyday life, i.e. relaxation. Previous research suggests that cannabis might be a safer alternative for more harmful prescription drugs (e.g. opioids) (Bachhuber et al. 2014; Lucas et al., 2019) and other psychoactive drugs used for recreational purposes (e.g. alcohol) (Subbaraman, 2014), however more research is needed to draw definitive conclusions.

## PART V General conclusions

Most self-identified medicinal cannabis users are daily users (cf. Troutt & DiDonato, 2015; Walsh et al., 2013; Swift et al., 2005; Sznitman, 2017; Zaller et al., 2015; Lin et al., 2016), consuming an average amount of 5 grams of herbal cannabis per week. This corresponds to a relatively low daily dose, and can be regarded as a protective factor for problematic consumption of cannabis. The majority indicates that this dose has not increased over time. However, the cannabinoid content of participants' cannabis products was unknown, which limits the informative value of these findings. Other scholars argue that standard cannabis units (dose of THC) should be implemented, applicable across different cannabis products and methods of administration. These units can also promote safer patterns of use (see Freeman & Lorenzetti, 2019).

Most participants' cannabis products are illicitly sourced. This puts the user at risk, because of the lack of quality control and the contaminants that have been detected in cannabis products obtained from unregulated sources (e.g. Dutch coffee shops) (Hazekamp, 2018, Hazekamp, 2006; Vanhove et al., 2018). In addition, most of these products are probably unstandardised and labelled inaccurately, which means that users are confronted with cannabis products with varying chemical compositions (Vandrey et al., 2015; Barrus et al., 2016; Bonn-Miller et al., 2017; Hazekamp, 2018), and which likely vary in produced effects as well (Bidwell et al., 2018). This means that medicinal cannabis users have to experiment with cannabis use patterns, which makes it more difficult for them to qualify the risks of their cannabis consumption.

The most frequently reported administration method among self-identified medicinal cannabis users in the present study is smoking cannabis (cf. Zaller et al., 2015; Walsh et al., 2013; Sznitman, 2017) with tobacco (in joints), and the most used cannabis product is herbal cannabis. Other modes of consumption regularly used by self-identified medicinal cannabis users are oral ingestion of cannabis liquids and vaporisation of herbal cannabis. Similar to studies conducted abroad (Hazekamp et al., 2013), very few participants report using an authorised pharmaceutical cannabinoid medicine. This was expected, since only one cannabis-based medicine is legally available in Belgium and solely reimbursed for MS patients (FAGG, 2017).

Methods of ingestion distinctly influence health outcomes from cannabis use. For instance, smoking cannabis is proven to be associated with increased adverse respiratory risks (Russell et al., 2018). Further research is necessary to document the health risks of the many emerging ingestion methods and forms of cannabis. For example, extremely high-potency cannabis concentrates are associated with mental health problems and have stronger negative effects than herbal cannabis (Chan et al., 2017). Oral ingestible cannabis products are safer with regards to respiratory problems, however the delayed psychoactive effects puts consumers at greater risk of an overdose (Russell et al., 2018).

The majority in this study use multiple administration methods and cannabis products concurrently. Using many different modes of consumption is proven to be associated with problematic cannabis use (Baggio et al., 2014). However, this association was found among a population using cannabis for non-medical purposes. My findings suggest that one of the reasons why multiple administration methods are used by self-proclaimed medicinal cannabis users is to optimise their treatments. Due to the current legal

prohibitions and the absence of physician involvement, medicinal cannabis users have to rely on self-experimentation with regards to their cannabis use patterns. The findings of this study illustrate that medicinal cannabis use patterns are very complex, flexible and dependent on the context, which makes it impossible to draw simplified conclusions. More in-depth research into medicinal cannabis use patterns is needed in order to be able to implement comprehensive and adaptive medicinal cannabis regulations. Based on the findings of the present study I can conclude that cannabis products are used differently than participants' conventional medicines. When regulating cannabis products it will be challenging to integrate them in exactly the same way as conventional pharmaceuticals in modern medicine. It is essential that regulations are open towards and take into account the different ways cannabis products are consumed and the unique use patterns of medical cannabis users. Therefore, studies surveying medicinal cannabis users are essential alongside clinical trials to inform future regulations.

Medicinal cannabis use is currently not integrated in conventional healthcare in Belgium (Nolf, 2004; FAGG, 2019). Nonetheless, it appears that patients are willing to disclose their medicinal cannabis use towards their physicians (cf. Piper et al., 2017; Belle-Isle et al., 2014; Lintzeris et al., 2018), despite the illegal status of cannabis. Most of them do not face disapproval when informing their physicians. This is an important first step for the integration of medicinal cannabis use in their health care and for harm reduction. However, there is no point in informing physicians when they appear to be uninterested, uninformed and do nothing with this information. Self-medicating with cannabis is currently the rule, while physicians supervising and giving guidance with regards to medicinal cannabis use is the exception. Information on medicinal cannabis use is mainly obtained from informal sources of health care information and almost never from formal sources, a finding in accordance with the results of other studies (Athey et al., 2017, Lankenau et al., 2018a). The internet, including social media, appears to be the most important informal source of information on medicinal cannabis use. There is an urgent need for physician supervision of medicinal cannabis use to prevent drug interactions, monitor unwanted side effects and to ensure safety and effectiveness. Making this possible in practice will require much more medical education and training on medicinal cannabis use than is currently available to Belgian healthcare professionals (Nolf, 2004; Ziemianski, et al., 2015; Ebert et al., 2015).

### *1.1 Comparing the profiles of (medicinal) cannabis users*

Cannabis' illegal status in Belgium results in the fact that all cannabis users are considered 'deviant' and are approached the same. No distinction can be made between 'legitimate' or authorised medical cannabis users and 'illegitimate' or unauthorised cannabis users. The participants in this study are individuals who label themselves medicinal cannabis users. There is an overlap between medicinal and recreational cannabis use, since most of them have a history of non-medical cannabis use, and a significant number use cannabis recreationally concurrently with their medical use. Their first experience with cannabis was in their adolescence, and many of them discovered and identified the

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therapeutic potential of cannabis when using it for non-medical purposes. These findings corroborate previous research (Swift et al., 2005; Ogborne et al., 2000; Lankenau et al., 2018a; Pacula et al., 2016; Schauer et al., 2016).

Since the number of self-identified medicinal cannabis users with a recreational history is high among the survey sample (73.5%), it is certainly possible that they reinterpreted their ‘deviant recreational cannabis use’ and translated it into ‘legitimate medical cannabis use’, a more socially accepted and less stigmatised form of cannabis use (Pedersen, 2015). In addition, the most cited symptom and condition among the study sample is chronic pain, which is difficult to assess objectively (Dansie & Turk, 2013). Other frequently reported indications are mental health problems, which are often over-treated and over-medicalised, mainly due to the interests of the pharmaceutical industry (Plos Medicine Editors, 2013). However, most survey participants’ conditions are diagnosed by physicians which suggests that their conditions are not self-defined, but formally recognised by the medical community (Hakkarainen et al., 2015). Only a few of the interviewees may have been using the label ‘medical’ as a justification for their recreational cannabis use and as a protection against social disapproval. Nearly all interviewees suffer from severe and diagnosed chronic conditions and turned in despair to cannabis as a last resort, because conventional healthcare was unable to help them overcome their suffering. Although scientific evidence for some of their conditions is still inconclusive or even non-existent, they indicate being helped with cannabis and some of them even being saved. In addition, the interviews show that several self-proclaimed medicinal cannabis users have broad interpretations of the concept ‘medicinal’ and think their motives for use are justified health purposes to use cannabis. It is important to note that there are differences between the two study samples regarding sociodemographic characteristics and experience with recreational cannabis use. The participants in the interviews are more likely to be female, older and to have no experience with recreational cannabis use in comparison with the survey participants.

Despite self-identified medicinal cannabis users’ considerable experience with recreational use, my findings suggest that their profiles might still differ from those of recreational users. Self-identified medicinal cannabis users in this study appear to be older, are more likely to be female and report a higher frequency of use compared to cannabis users sampled from the general Belgian population (Gisle, 2014). It does not come as a surprise that my data suggest that self-identified medicinal cannabis users who use cannabis for recreational purposes alongside their medical use, have more similarities with recreational cannabis users than self-described medicinal cannabis users who use cannabis exclusively for medical purposes.

My analyses compared exclusively medicinal cannabis users with medicinal cannabis users with a recreational history and medicinal cannabis users reporting concurrent recreational use. Unlike the study findings of Walsh et al. (2013) and consistent with the results of Boehnke et al., (2019), I found that medicinal cannabis users who have used cannabis recreationally differ significantly from those who have no history of recreational cannabis use. Walsh and colleagues (2013) compared therapeutic cannabis use across medical conditions and across authorised and unauthorised users living in Canada. They found that individuals with and without a non-therapeutic history did not differ regarding



sociodemographic characteristics, conditions and symptoms. The study of Boehnke et al. (2019), conducted in the United States, suggests that medical cannabis users who reported concomitant recreational use were significantly younger, were more likely to be male, reported higher rates of alcohol use and used cannabis for a longer period than medical cannabis users not using cannabis for recreational purposes. These results were corroborated by the findings of the present study. Bivariate analyses of the survey data suggest that there are significant differences between the three subpopulations with regards to sociodemographic characteristics, illicit drug use, ingestion methods, cannabis products, first use of cannabis, medical conditions and symptoms, motives for cannabis use, setting of use, and attitudes and experiences regarding recreational cannabis use and the psychoactive effects of cannabis.

Self-identified medicinal cannabis users using cannabis solely for medical purposes are older, more likely to be female, and less likely to have used other illicit drugs and to use cannabis for mental health problems. They start using cannabis at an older age, were using cannabis for a shorter period at the time of the study and are less likely to inhale cannabis. Non-medical motives for using cannabis are significantly more frequently cited by medicinal cannabis users reporting concomitant recreational cannabis use. They are more likely to experience a ‘high’ (cf. Sznitman, 2017) and to think of it as therapeutically valuable. The fact that self-proclaimed medicinal cannabis users who have a recreational history are more likely to use cannabis for mental health problems deserves special attention. Regular cannabis use can be a contributory cause of these mental health problems, and thus using cannabis to cope with mental health problems is not without risks (Lazareck et al., 2012).

Participants who only have experience with medical cannabis use report more often that their cannabis dose has been stable since they started using cannabis, while people with a recreational background are more likely to report variance in their use patterns. It is possible that the dose when using recreationally is less consistent compared to medicinal cannabis use. In addition, the dose used for recreational purposes might differ from the dose when using medicinally. Finally, medicinal cannabis users reporting concomitant recreational use, use cannabis more often in a social context (e.g. at a party and at friends’ homes) and in the presence of others (e.g. friends).

The findings of the survey analysis in which the subgroups are compared, show that it is meaningful to divide them into the three user groups. Most notable differences were identified between medicinal cannabis users reporting concurrent recreational use and exclusively medicinal cannabis users. Self-described medicinal cannabis users who used cannabis recreationally in the past appear to form a middle-group. It seems that exclusively medicinal cannabis users form a distinct group and are distinguishable from self-identified medicinal cannabis users who have a non-medical cannabis history. However, these differences are merely suggestive results which should be interpreted carefully because of methodological limitations. The results are based on bivariate analyses and were not controlled for confounders in multivariate models due to time constraints.

The qualitative findings show that there are some similar trends noticeable with regards to user profiles. For instance, there were some notable differences between self-described medicinal cannabis users who never used cannabis recreationally and obtained cannabis on prescription versus self-proclaimed

medicinal cannabis users who are experienced in using cannabis recreationally and who obtained it from unofficial supply sources. Some interviewees can be considered to be part of or influenced by the recreational cannabis culture; i.e. they are more likely to use a recreational cannabis argot (e.g. names of popular cannabis strains), use ‘recreational’ cannabis administration methods (e.g. joints), their houses are decorated with symbols that are typical for the recreational cannabis culture, spend their time with other recreational cannabis users and/or report more non-medical cannabis use motives. Meanwhile, other participants are less familiar with the traditions within the recreational cannabis culture. This illustrates that medicinal cannabis use is currently influenced by the recreational cannabis culture in Belgium. However, using qualitative research methods also allows us to illustrate that creating user profiles would be overly simplistic and not covering the reality. Although the interviews show certain profiles I found many exceptions of individuals who do not fit into certain profiles. Furthermore, the quantitative results show -together with other studies (e.g. Athey, 2018; Lankeau et al., 2018)- that the (medicinal) cannabis using population is very heterogeneous.

Other scholars have examined the differences and similarities between authorised and unauthorised medicinal cannabis users in countries where medicinal cannabis use is legalised (e.g. Sznitman, 2017; Walsh et al., 2013; Roy-Byrne et al., 2015). Sznitman (2017) found that licensed medical cannabis users in Israel were more likely to report cannabis use patterns consistent to medication use patterns compared to unlicensed users. The present study echoes these results for exclusively medicinal cannabis users. This subpopulation does not correspond to the stereotype of a recreational cannabis user (e.g. a young man smoking cannabis with joints) and appears to have more in common with authorised medicinal cannabis patients (de Hoop et al., 2018; Sznitman, 2017).

The profiles and cannabis use patterns of medicinal cannabis users are shaped and influenced by external factors, including the legal and sociohistorical context. Since the cannabis landscape and regulations are transforming quickly worldwide, this means that it is likely that the profiles of medical cannabis users and their use patterns are changing rapidly as well. Over the past years, medicinal cannabis users had a typical profile of younger men who had experience with recreational cannabis use and were suffering from particular diagnosed conditions (e.g. HIV) or reported self-defined health purposes for using cannabis (e.g. depression). More recently, we see that this profile is becoming highly diversified. For instance, in countries where cannabis is regulated there is increasingly more interest and higher prevalence rates of women and elderly people using cannabis for health purposes (de Hoop et al., 2018; Boehnke et al., 2019; Bobitt et al., 2019).

## **2. What is medicinal cannabis use?**

The aim of this study was to gain in-depth understanding of the concept ‘medicinal cannabis use’ from the insider’s perspective. It turned out to be challenging to construct conceptualisations of ‘medical cannabis use’. Whereas cannabis was previously defined and treated within a criminal framework, there

is now a shift to conceptualizing and treating cannabis use within a medical as well as recreational framework. These frameworks are fluid and show overlap. In line with other authors' statements (Athey et al., 2017; Bostwick, 2012; Newhart, 2013; Pedersen & Sandberg, 2013; Reinerman et al., 2011; Pedersen, 2015; Grinspoon & Bakalar, 1997; Grinspoon, 2010), the current study findings suggest that the boundaries between recreational and medicinal cannabis use are blurred and that these vague dividing lines are frequently crossed. The reality regarding medicinal versus recreational cannabis use is too often reduced and its complexity is oversimplified in discourses of the public, policy and the medical community. Whereas portraying recreational and medicinal cannabis use as two opposites is at the very least misleading, it would be equally incorrect to proclaim that they are identical. This study aimed to preserve nuance by illustrating that cannabis use is very personal and context-dependent. It tried to debunk the most prevalent misconceptions about recreational and medicinal cannabis use.

This study provides valuable insights about the meaning of medicinal cannabis use from an insider perspective. The results from the qualitative interviews indicate that self-identified medicinal cannabis users' own attitudes regarding the meaning of the concepts of 'recreational' and 'medicinal' cannabis use are mixed. While a proportion of the self-proclaimed medicinal cannabis users have a clear understanding of the two concepts, and think there is an obvious distinction, others experience difficulties when defining the two types of use.

### *2.1 Symbolic boundary work*

Due to the current unacceptance of medicinal cannabis use legally and medically, interviewees felt a strong need to define, to conceptualise and to make distinctions between medicinal and recreational cannabis use. Cannabis was redefined by novice as well as experienced cannabis users. Cannabis' status changed from a recreational and/or illicit drug into a legitimate medical treatment.

Symbolic boundaries (Lamont & Molnár, 2002) are used by self-proclaimed medicinal cannabis users in the present study to make sense of the concept medicinal cannabis use. They are equally used to make a distinction between recreational and medicinal cannabis use, in order to avoid stigma and to gain social acceptance for the latter. Firstly, symbolic boundaries are drawn between cannabis and illicit recreational drugs on the one hand, and cannabis and pharmaceutical medicines on the other hand. Illicit drugs and pharmaceutical medicines have in common that both categories of substances are labelled as 'chemical' and therefore considered more harmful than cannabis (cf. Pedersen & Sandberg, 2013). The interviewees use different strategies of risk denial in order to avoid stigma associated with cannabis use by comparing the risks of cannabis with those of other substances (Perreti-Watel, 2003).

Secondly, self-identified medicinal cannabis users speak of 'recreational cannabis' and 'medical cannabis', as if they are two different products or objects. These symbolic boundaries are also discernible in research and policy, where a distinction is made between herbal cannabis products and medically tested pharmaceutical cannabinoid drugs (Committee on the Environment, Public Health and

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Food Safety, 2019), similar to the social construction of illicit drugs and licit medicines (Cohen et al., 2001; Järvinen & Demant, 2011; Walker, 2017).

Thirdly, the purposes of cannabis use are symbolically separated into (the indulgence in) intoxication on the one hand and the relief of pain -every type of suffering- on the other hand. Self-identified medicinal cannabis users think of (other) recreational cannabis users mostly as people who want to get 'high'. However, the meaning of the concept 'high' is far from clear. This stereotyping and scapegoating of recreational cannabis use(rs) might be a way for self-identified medicinal cannabis users to disassociate themselves from other types of users who are more stigmatised (Pedersen & Sandberg, 2013; Peretti-Watel, 2003) in order to gain acceptance for medicinal cannabis use. The image that they portray of recreational cannabis users matches with adolescents recreational users' profiles, while their own profiles and attitudes correspond with adult recreational users, as we can see in the recent study of Rossi (2019). Self-identified medicinal cannabis users categorise and stigmatise recreational cannabis users by differentiating their identities from their own (Peretti-Watel, 2003; Lamont & Molnár, 2002). It is likely that self-proclaimed medicinal cannabis users' own perceptions of recreational cannabis use are influenced by the dominant prevailing discourses on recreational cannabis use. While participants' discourses on recreational cannabis use(rs) were loaded with stereotypes, their attitudes were ambivalent at the same time. Their narratives illustrate that the concepts of 'medicinal' and 'recreational' cannabis use are subjective and not easily defined.

The dual status of cannabis, commonly used and portrayed as an illicit recreational drug versus the increased recognition of legitimate medical cannabis use, shapes the complex and ambivalent attitudes among medicinal cannabis users towards cannabis. The last chapter of the empirical results illustrated how self-identified medicinal cannabis users employ many strategies to gain social acceptance for and to justify their cannabis use. This study was conducted in Belgium where there is no legal framework for medicinal cannabis use, except for the pharmaceutical medicine Sativex®. This means that there might be a stronger connection between recreational and medicinal cannabis use than in countries where (semi) legal supply sources have been around for years (e.g. Canada). This might mean that medicinal cannabis users living in Belgium experience more internal stigma and feel a stronger need to justify their medicinal use and distinguish it from the recreational cannabis culture. When a medical framework is implemented and cannabis is integrated into conventional medicine, for instance by the general acceptance of pharmaceutical cannabis-based medicines and medical methods of ingestion, the distinction between recreational and medicinal cannabis use might become more obvious.

The present study suggests that the stigma associated with cannabis also has behavioural consequences for self-identified medicinal cannabis users, including disclosure decision-making. Disclosure of medicinal cannabis use is the highest to close family members and friends. Nondisclosure is mainly motivated by the fear of stigma. Although positive social support is much more common than negative social support, a large number of the self-identified medicinal cannabis users report receiving a mixture of negative and positive reactions.

If Belgium were to follow other countries in the trend of regulating medical cannabis and improving its accessibility, this might have a positive influence on the social acceptance of medicinal cannabis use and the empowerment of medicinal cannabis users. However, fifteen years after the legalisation of medical cannabis in Canada and Colorado (US), medical cannabis users still experience stigma and barriers regarding accessing medical cannabis (Leos-Toro et al., 2018; Bobitt et al., 2019). When the substance cannabis remains criminalised for other purposes it might reflect negatively on medicinal cannabis use as well (Bottorf et al., 2013). In addition, only when cannabis is accepted by medical professionals and the healthcare industry will it be considered as a true ‘medicine’ in public perception.

## *2.2 Medicinal versus recreational cannabis use*

Whilst one of the previous sections elaborated on differences in cannabis user profiles, this section discusses the conclusions regarding the intersections and dissimilarities between medicinal and recreational use patterns and motives for use. Self-identified medicinal cannabis users’ narratives and self-reports suggest that ‘medical’ and ‘recreational’ use differ with regards to use patterns, motives for use, setting and perceived effects.

Motives for use were the most important determinants for cannabis use to be defined as ‘medicinal’ by medicinal cannabis users themselves. By focusing on self-described medicinal cannabis use in this thesis I attempted to unravel the wide range of cannabis use motives. This study suggests that cannabis is used for physical as well as emotional discomforts and that cannabis use has a wider impact than ameliorating physical health problems as it also can improve patients’ well-being. Self-described medicinal cannabis users’ self-reports show how cannabis influences other life areas and patients’ quality of life (cf. Dahl & Frank, 2011; Chapkis & Webb, 2008).

Self-described medicinal cannabis users in this study report non-medical motives for using cannabis, including ‘therapeutic’ and ‘instrumental’ motives. Self-medication for self-diagnosed health purposes can be considered close to recreational use when using the substance for relaxation and tension reduction. While, medical and recreational cannabis use motives can be considered to be intertwined, this study also identified meaningful differences between the two types of use. Although a significant number of interviewees report non-medical motives, the number of the ‘typical’ recreational cannabis use motives, such as relaxing, experimenting, partying and socializing with friends are much less frequently reported than medical motives for use. Medical motives are far more important to self-proclaimed medicinal cannabis users than using cannabis for recreational purposes.

Alternative treatments, including herbal therapies, are more viewed as holistic by incorporating emotional, mental, spiritual and physical aspects (Karimi et al. 2015; Barrett et al., 2003). Medicinal plants, such as cannabis, have coexistent religious, spiritual, emotional, therapeutic and medicinal roles (Winkelman, 2007). Whether cannabis is used as a holistic treatment differs considerably from one participant to the next. For some, cannabis is a multipurpose medicine, as they use cannabis intentionally

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for multiple therapeutic purposes. Others use cannabis similarly to taking other medicines. There are very few participants who use a consistent dose of cannabis with a consistent dose frequency for one particular health problem. Nonetheless, this might also be due to the current lack of medical guidance, by which participants are forced to self-experiment with cannabis use patterns.

Besides differences in motives for using cannabis, the findings of this study suggest that there are differences between the use patterns of medical and recreational cannabis use. Self-identified medicinal cannabis users' frequency of cannabis use for health purposes is higher than for recreational purposes. This finding is consistent with previous studies (Bostwick, 2012; Lin et al., 2016; Walsh et al., 2013; Sznitman, 2017; Pacula et al., 2016; Roy-Byrne et al., 2015; Goulet-Stock et al., 2017). While it is often necessary to use cannabis daily for symptom relief, cannabis is irregularly used for recreational purposes. Unlike using cannabis medicinally, recreational cannabis use is not a necessity and more often restricted to the leisure sphere.

Another distinction that self-identified medicinal cannabis users make between recreational and medicinal cannabis use is the difference in experienced effects. They believe that recreational users experience more intense psychoactive effects, while medical use is mainly characterised by therapeutic (physical) effects. It is plausible that medicinal cannabis users experience less psychoactive effects due to administration methods, dose, frequency of use and the levels of psychoactive cannabinoids of their cannabis products. Since cannabis is the same substance when used for recreational and medicinal purposes, effects and experiences are also likely shaped by the beliefs and expectations of the users as well as the setting (Chapkis, 2007; Zinberg, 1984; Dahl & Frank, 2011). This becomes clear in the cases of self-identified medicinal cannabis users who had used cannabis recreationally in the past and reported different experiences since they became disabled. They re-constructed their recreational cannabis use as medicinal cannabis use. Simultaneously, a change in use patterns, experiences and/or the setting of use was discernible.

Self-identified medicinal cannabis users' purposes of cannabis use and desired effects of cannabis appear to depend on the context. One individual can use cannabis for diverging purposes which can be grouped under 'recreational' or 'medicinal', or both – one does not preclude the other. For instance, the interviews illustrate that one individual can use cannabis alone at home to reduce painful spasms and at other times to relax when watching a movie. Consistent with the qualitative studies of Newhart (2013) and Chapkis (2007) conducted among medicinal cannabis users in the US, interviewees timed their use "to maximise productivity".

More in-depth research is needed with adult populations using cannabis to document all intentions and types of cannabis use. Studies of adult populations are necessary as other scholars have shown that cannabis users are aging (Rossi, 2019; Bobitt et al., 2019). When looking at previous studies into recreational and medicinal cannabis use, a difference between the two types of use seems to be that recreational cannabis use is a social and group phenomenon, especially among youth (Järvinen & Demant, 2011) and medicinal cannabis use is not (Roy-Byrne et al., 2015; Sznitman, 2017; Lankenau et al., 2018a). However, this image of recreational cannabis users, that was also portrayed by the

interviewees in this study, matches better with adolescent recreational users' profiles, while medicinal cannabis users' own profiles and attitudes appear to correspond more with adult recreational users (Rossi, 2019). The function of cannabis appears to diverge depending on the user's stage of life (Järvinen & Demant, 2011; Athey, 2018; Newhart, 2013; Ellickson et al., 2004; Bobitt et al., 2019; Rossi, 2019). For older self-identified medicinal cannabis users the social aspect of cannabis use and getting 'high' is less important than to young users (cf. Athey, 2018; Newhart, 2013). The present study suggests that social cannabis use belonged mostly to medicinal cannabis users' past, when they were younger.

It is important to acknowledge that psychoactive substances, including cannabis, are used for various purposes in different contexts, including what are called 'instrumental', 'therapeutic', 'recreational', 'medicinal', 'spiritual' and 'religious' motives. It is noteworthy to recognise that these categories of use motives are highly personal and might show conceptual overlap. Since cannabis use motives are context-dependent and can be interwoven, it is important to conduct further research into cannabis use starting from a blank page without predefined concepts. This will teach us more about the needs and preferences of people using cannabis, which move beyond the dichotomy 'medical' versus 'recreational'. Only if this theoretical knowledge exists, will it be possible to define and implement adequate policy appropriate for this complex phenomenon. As Lankenau et al. (2018, p. 243) wrote "patients who use for both medical and non-medical purposes, however, may present challenges to broader definition and conceptions of what constitutes legitimate or appropriate use of marijuana." The fact that individuals switch from the identity of a recreational to that of a medicinal cannabis user, back and forth (Roy-Byrne et al., 2015; Lankenau et al., 2018a), may pose additional challenges for policy makers and health care professionals. The way medicinal and recreational cannabis use is conceptualised by users themselves is important to inform policy making.

Studies suggest and practice shows that recreational and medicinal cannabis use(rs) are not always easily separated (Lankenau et al., 2018; Newhart, 2013). If we look at other psychoactive substances that are used recreationally as well as medically, important distinctions between the two arise from the well-delineated medical framework of the latter and the illegal status of the other. For instance, opioids used for medical purposes cover pharmaceutical preparations dispensed in a strictly regulated market and prescribed by physicians. This is currently very different for cannabis products.

Firstly, people have reported using cannabis for medicinal purposes in multiple jurisdictions, without being necessarily supervised by a physician, having a physician's recommendation or prescription, being registered as an official medical cannabis user or even having an official medical diagnosis (Pedersen, 2015; Pacula et al., 2016; Shauer et al., 2016; Metrik et al., 2018; Lankenau et al., 2018; Ware et al., 2005). In addition, medicinal cannabis users report using cannabis "off-label", i.e. for different indications than the approved medical conditions (Newhart, 2013).

Secondly, research conducted in countries where cannabis use is illegal and where no medical cannabis programs were installed at the time of study, shows that individuals report medical purposes for their cannabis use without having any official approval (Ware et al., 2005).

Thirdly, cannabis products used for medicinal purposes are obtained on prescription from pharmacies, but also through home cultivation, cannabis dispensaries, social supply, cannabis social clubs and the internet (Pardal & Bawin, 2018; Grella et al., 2014; Belle-Isle & Hathaway, 2007; Swift et al., 2005, Ogborne et al., 2000; Walsh et al., 2013; Lucas, 2012; Hazekamp et al., 2013). This means that the lines between self-medication with cannabis and supervised medical cannabis use are currently unclear. When cannabis is properly integrated as a medicine and when a well-functioning and well-integrated medical access framework has been set out, it will be easier to distinguish between supervised medical cannabis use and self-medicating practices with cannabis.

Medical cannabis use is currently poorly integrated in Belgium because of the lack of regulations and a therapeutic framework. As a result, the influence of the recreational cannabis culture is inevitable. Since neither medical cannabis products, medical supervision nor medical information are accessible in Belgium, respondents are forced to rely, for the most part, on cannabis products, supply sources and information that originated in recreational cannabis circles. The future will have to show if these two cultures will continue to be mixed or if they will be completely separated from each other. Scientific research is one of the factors, amongst others, that currently influences medical cannabis debates and will continue to shape future (medical) cannabis regulations and how these will be implemented in practice. One example of this, is the body of research that concludes that the classifications of cannabis ‘Indica’ and ‘Sativa’ –terms commonly used among recreational cannabis users- are no longer accurate for cannabis strains currently available, and that there is need for a scientific taxonomy of cannabis species (Elzinga et al., 2015; McPartland, 2017). Policy makers (e.g. Committee on the Environment, Public Health and Food Safety, 2019) and researchers (McPartland, 2017; Hazekamp & Fisdick, 2012) advocate for more detailed terms and more accurate nomenclature for cannabinoid products and more differentiation of how to approach these different products. Other evolutions are the emerging advanced medical ingestion methods and the development of pharmaceutical cannabinoid products only intended for medical use. All these current developments and policy decisions will shape the future of the medical cannabis landscape and discourses on medicinal cannabis use.

### *2.3 Is the cannabis ‘high’ therapeutically valuable?*

Humans have an innate drive towards consciousness alteration (Siegel, 2005). In a Western medical context drugs’ psychoactive effects form a controversial and delicate issue. Substances with psychoactive properties are mainly discussed with regards to their risks of dependence and abuse. The therapeutic value of psychoactive effects such as an altered state of consciousness or the ‘high’ is rarely discussed in conventional medical research. When exploring the existing literature on drug use with the search terms ‘medical drug use’ or ‘medicines’ and ‘psychoactive effects’ or ‘euphoria’, the results that are generated cover mainly topics which comprise ‘non-medical use’, ‘abuse’, ‘dependence’, ‘addiction’ and ‘medical cannabis use’. Altered states of consciousness that fall outside the scope of Western medicine, are important in particular treatments in alternative or pseudo medicine (Wadley, 2016).



Research has paid attention to the therapeutic role of consciousness alteration in, for instance, the use of medicinal plants by indigenous peoples (Shepard, 1998) and in shamanism (Krippner, 2000). The therapeutic value of altered states of consciousness can also be found in psychotherapy (Shalit, 2012), meditation (Ivanovski & Malhi, 2007) and hypnosis for pain management (Madden et al., 2016). However, the use of psychoactive medicines to alter consciousness for therapeutic purposes is virtually non-existent in modern medicine, especially with regards to physical health problems.

Cannabis' mind-altering effects are a complex dimension of cannabis use. In addition, feeling 'high' or 'stoned'- and enjoying these sensations- is understood as a crucial component of what makes cannabis a recreational substance and what distinguishes it from medical cannabis use. This thesis shows that the psychoactive effects of cannabis are experienced, interpreted and valued differently. For a number of self-described medicinal cannabis users, I found that the mental effects of cannabis have added therapeutic value. Firstly, participants' narratives suggest that cannabis enhances introspection and awareness of the body and the self, which helps them to cope more effectively with mental and physical discomforts. Secondly, according to the respondents in the present study, cannabis induces mental distraction and disassociation which acts as a form of mental and physical symptom relief, in particular with regards to pain reduction. Thirdly, participants suggest that the mental relaxation yielded by cannabis lessens emotional and physical stress. My data illustrate that the value of the mental effects of cannabis depends on their intensity. High levels of intoxication (i.e. "feeling high") are most of the time considered no longer to be therapeutic, but undesired and not the purpose of using cannabis medicinally. Although the psychoactive effects of cannabis might be therapeutically valuable, they are most of the time less important to medicinal cannabis users than the 'actual' therapeutic effects (e.g. relief of pain). However, these two type of effects are not always easily separated (see Dertadian, 2018; van de Donk et al., 2019). For similar findings on therapeutic value of the psychoactive effects of cannabis see for example Pedersen and Sandberg (2013).

On the other hand, other self-described medicinal cannabis users did not experience any psychoactive effects or regarded them as undesirable side effects. This finding is consistent with previous research findings (Pedersen & Sandberg, 2013). For them, psychoactive effects had no therapeutic value. The fact that multiple participants did not enjoy using cannabis, is an indication that people take the risks of choosing an illegal, contested and stigmatised treatment for their health, and that they are not masqueraded recreational users who use the medical label as a justification for their use. Generally, cannabis was not chosen because of its pleasuring effects but for its beneficial impact on health. Examining the therapeutic value of psychoactive effects and the role of pleasure in medical cannabis use, illustrates that whether effects are desired or undesired is context dependent (Dwyer, 2008) and socially constructed (Becker, 1973).

Closely linked to the 'high' is the pleasure or enjoyment of using cannabis. Pleasure-seeking is often a criterion for defining the use of psychoactive medicines as 'non-medical' (Dertadian, 2018). Self-described medicinal users might downplay the psychoactive effects of cannabis since these are associated with recreational cannabis use. It is very possible that they delineate the therapeutic effects

from the psychoactive effects of cannabis, because intoxication is considered irrational and stigmatised whereas rationality is highly valued (Holt & Treloar, 2008; Ryan & Sharts-Hopko, 2017). In Western cultures, pleasure is often constructed as the indirect opposite of rationality, and people are expected to be risk-averse (Dwyer, 2008). Claiming self-confidence and self-control are strategies employed by medicinal cannabis users in the present study to deny the risks of cannabis use in order to avoid stigma (Peretti-Watel, 2003).

Political discourses on drugs that are silent about drug pleasures shape the conception of drugs (Lancaster et al., 2017; Dwyer, 2008). However, paying attention to pleasure and the enjoyment of psychoactive effects is important for a critical approach in future policy making. As Duff (2008) notes, drugs produce performative pleasures alongside physiological pleasures. It is plausible that medicinal cannabis users experience some kind of pleasure when complaints are relieved and a normal bodily and mental status is achieved, without necessarily achieving an enhanced mood through the use of cannabis. The pleasurable experiences of cannabis go beyond the psychoactive experience of the ‘high’. Pleasure is more than the euphoria of a ‘high’, as it involves a range of feelings (Dertadian, 2018; Bundy & Quintero, 2017). Pleasure is not only a physiological sensation, but shaped by the social context (Keane, 2008; Dwyer, 2008). The current study shows that pleasure caused by intoxication is not inherent to the use of cannabis. Instead, higher stages of intoxication and the associated pleasurable sensations are dependent on the context, the interpretations and expectations of the user and the purposes for which cannabis is consumed (Holt & Treloar, 2008; Becker, 1953; Zinberg, 1984; Dwyer, 2008). Therefore, when studying the role of psychoactive effects when cannabis is used for medicinal purposes, it is important to consider the social context and setting of the use and how this might differ from the (social) context of cannabis used for other motives.

If we wish to evaluate whether the ‘high’ is therapeutically valuable or not, it will be necessary to change our current terminology. The concept ‘high’ is an abstract and fuzzy concept and is a collective name for different experiences and sensations (Tart, 2001). The present study and other research (Chapkis, 2007; Grinspoon & Bakalar, 1997) show that medicinal cannabis users experience diverse effects. More specific and concrete terms are needed to describe sensations and experiences that are easier to identify for the user. This is in particular important for novice users, since the ‘high’ is learned (Becker, 1953). This study suggests that novice users were not sure how to interpret the psychoactive effects of cannabis and how to define these effects as a ‘high’. At the same time it is important to acknowledge that people are likely to give different interpretations and meanings to these experiences when using cannabis, as suggested in this study and other research (Coomber et al., 2003). Another reason to abandon the term ‘high’ is because of the stigma associated with the term due to its recreational origin (Chapkis, 2007).

### 3. Limitations of the present study and suggestions for further research

Conclusions drawn from this study should be considered in light of the study's limitations, some of which offer potential avenues for future research.

By using a mixed-methods design, I was able to gain a breadth and depth of understanding of self-defined medicinal cannabis use. Triangulating data collection methods allowed me to identify different aspects of this complex phenomenon more accurately by approaching it from different angles (Creswell, 2009). However, the composition of the survey and interview samples slightly differed from each other, with respect to particular sociodemographic characteristics and experience with recreational cannabis use. In spite of these differences, there were no major inconsistencies between the findings collected with both methods.

A limitation of the current study is that it relies on self-reports, thus more objective data on the use patterns and experiences of cannabis users is necessary. Alongside studies in which questionnaires are utilised, more clinical research is needed, because of the discrepancy between the limited scientific evidence for the therapeutic potential of cannabis and the vast array of self-reported conditions for which cannabis is used in practice. Large-scale double blinded clinical research is essential to build evidence on the benefits and risks of cannabis and to detect drug interactions. The efficacy and harmfulness of cannabis products have to be compared to these of existing medicines in medical research.

Drawing conclusions regarding efficacy and safety based on self-reports is not recommended overall. One of the most important limitations of this study is recruitment bias (Etikan et al., 2016). This study likely attracted people who have positive experiences with and attitudes towards medicinal cannabis use (cf. Webb & Webb, 2014; Ware et al., 2005; Coomber et al., 2003; Bortorf et al., 2013). Conversely, those with negative attitudes and experiences are likely underreported in this study. The self-selection bias in the present study constitutes an additional limitation as self-reported effectiveness is likely to be overrated and riskfulness underrated by highly motivated participants. It is commonly known that illicit drug use is a sensitive research topic, and this means that there is always the risk of a social desirability bias. Stigma associated with cannabis use might result in the fact that the positive aspects of cannabis are overemphasised. These positive responses may also be motivated by the thought that the study might contribute to legalisation of medicinal cannabis use. Through their participation, some of my participants were seeking to increase the accessibility of cannabis (cf. Decorte et al., 2019). This limitation illustrates the need for larger representative samples. The sample of this study was not randomised and relatively small. It will be only possible to select representative samples in countries where medicinal cannabis is regulated and where patient data regarding medicinal cannabis use are documented systematically.

This study focusses on the profiles of self-described medicinal cannabis users. My findings suggest that people who have experience with recreational cannabis use differ significantly in multiple respects from exclusively medical cannabis users. This finding is of importance for future studies that are population-based. It was clear that people who never used cannabis recreationally were characterised by different

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profiles, medical conditions and cannabis use patterns. It is important to identify the preferences and experiences of novice medicinal cannabis users, as their profiles differ from people who have a non-medical cannabis history. However, novice users were a smaller subpopulation of the sample in the current study. Further research among larger sample sizes is required to improve our understanding of the experiences and attitudes of these ‘novice’ medicinal cannabis users, and to identify possible differences between them and ‘seasoned’ users. In addition, another limitation is that the findings of the current study are based on bivariate analysis. The variables were not analysed with multivariate analysis to test for possible confounders.

The research population of this study are ‘self-identified medicinal cannabis users’. Quantitative research has been performed that looked into the differences between recreational and medicinal cannabis users (e.g. Goulet-Stock et al., 2017). Most of these quantitative studies have focussed on user profiles and use patterns, and less on use motives. There should be a focus on the similarities and differences in use motives instead of focussing mainly on the profiles of cannabis users. There is currently a too strong emphasis on the distinction between medical and recreational cannabis use. More often, severe diseases are the focus when medical cannabis use is discussed in the media and the subject of earlier research. Therefore, my suggestion is to conduct more studies with recreational and medicinal cannabis users to compare their experiences and motives for use. Since most cannabis user studies are still performed with adolescents and young adults, more research is needed among older user populations. There is a gap of knowledge regarding adult (recreational) cannabis user populations’ profiles, patterns of use, motives for use and self-reported experiences and attitudes. Qualitative in-depth studies comparing adult medicinal and recreational cannabis users are essential as previous research suggests that cannabis users are aging and adults have report different use motives and social settings of use than adolescents (Rossi, 2019; Lankenau, 2018a; Athey, 2018; Bobitt et al., 2019). This might show that ‘recreational’ cannabis use diverges from the stereotype that we previously portrayed of recreational use in dominant discourses.

Repeating this type of population-based medicinal cannabis studies in the future and in other jurisdictions will already produce original results as medicinal cannabis regulations are constantly shifting all over the world. In this way, comparisons between different jurisdictions and medicinal cannabis policies can be made. Longitudinal studies are needed to assess the impact of changes in cannabis policies and markets on user experiences, profiles, attitudes and use patterns. For instance, the medicinal cannabis sector is rapidly evolving, as we observe an emerging market of non-psychoactive CBD products (Freeman et al., 2019). This means that studies on medical cannabis use motives and patterns remain of great interest.

Finally, more studies testing the quality and composition of cannabinoid products used by medicinal cannabis users living in Europe are necessary. To date very little research has been conducted to assess the quality of cannabis products used for medicinal purposes (e.g. Hazekamp, 2018; Pavlovic et al., 2018). The standardisation and consistency of the chemical composition of medicines is in the interests of patients’ health. Medical cannabis products therefore should be produced in a way that it is possible

to achieve standardisation. However, currently evidence is lacking on the specific cannabinoid proportions necessary to treat particular conditions. More studies are needed studying cannabis products with different cannabinoid ratios and their therapeutic effects (e.g. López-Valero et al., 2018).

### *3.1 The need for observational studies and real world evidence*

It is necessary that current (medical) research paradigms are further developed with regards to medical cannabis research. It is unlikely that clinical trials will be able to cover the wide variety of cannabis products that are used to treat diverse medical conditions and symptoms through different administration methods. Therefore, gathering ‘real world data’ (RWD) on medicinal cannabis use, which means gaining knowledge from patients already using cannabinoid products in real-world settings, can produce valuable ‘real world evidence’ (RWE) complementary to clinical trials. Sherman et al. (2016, p. 2293) have defined RWE as “information on health care that is derived from multiple sources outside typical clinical research settings, including electronic health records (EHRs), claims and billing data, product and disease registries, and data gathered through personal devices and health applications.” Population-based studies gathering RWD should not be undervalued in the context of medicinal cannabis use. Patient-inspired research in which self-reports and patient data are collected, is an important source of knowledge alongside clinical evidence. Expanding RWE on patients’ personal experiences and use patterns is essential to inform regulations on medicinal cannabis use.

As mentioned previously, there are numerous cannabis products with varying chemical compositions available, that are consumed by patients using diverse administration methods. It would be highly expensive and time-consuming to test all these possible combinations in high-quality clinical trials. RWD can give more information on the cannabinoid levels of the cannabis products and on modes of consumption used by patients and their perceived effectiveness and side effects. This is only possible in jurisdictions where patients have access to and use cannabinoid products of which the chemical concentrations are known. Observations of patient populations who use cannabis products obtained in unregulated circuits are useless for this purpose, given the fact that the actual chemical composition of unregulated products can deviate from what is claimed on the labels of those products (Hazekamp, 2018; Barrus et al., 2016; Vandrey et al., 2015; Bonn-Miller et al., 2017).

Surveys among medicinal cannabis users can tell us more about the reasons why certain cannabis products and ingestion methods are preferred, alongside motives related to efficacy and safety. My findings suggest there are other important aspects such as the expense, practicability and the context in which cannabis is used. Knowledge on cannabis use patterns is an important precondition for physicians to be able to supervise medical cannabis use properly. Physicians play a key role in the access to treatments, and this should not be different for cannabis as they are also responsible for other treatments their patients are undergoing.

Previous research shows that in jurisdictions where medicinal cannabis programs are installed, cannabis is found beneficial for conditions not listed in the program (Troutt & DiDonato, 2015; Nunberg et al., 2011; Walsh et al., 2013). This underlines the need for studies gathering RWD regarding the harms and benefits of cannabis, which can be a starting point for clinical trials. Self-reports are necessary to unravel the complete spectrum of cannabis' therapeutic potential. Observational studies tell us more about the substitution of prescription drugs and the reduction of other –possibly more harmful- medicines among medicinal cannabis users. This type of knowledge goes beyond the research goals in clinical trials. Observational studies can provide valuable knowledge on long term and short term adverse effects, and on tolerance to these side effects. The safety of cannabinoid products will have to be proven by following-up patient populations in cohort studies. The implementation of a medical cannabis program and follow-up studies are the best way of monitoring patients and obtaining continuous sets of comprehensive data of sufficient quality on a systematic basis. Especially in the landscape of medicinal cannabis use, patients themselves can play an important role as the landscape and regulations are still developing and knowledge is still growing, and still many aspects remain hidden and unstudied.

### **4. Recommendations for practice and policy**

The cannabis landscape continues to change quickly and radically worldwide. It is more precise to say that we are at the infancy of a new complex phenomenon that is becoming integrated, structured and rooted in our current society. Since medicinal cannabis programs have been operational in countries abroad already for many years (e.g. Canada, the Netherlands and Israel), there might be a lot to learn from both their successes and failures. We must remain critical towards policy decisions that are currently made and learn from mistakes made in the past with regards to regulating psychoactive substances, in a medical as well as in a non-medical context. Commercial interests in cannabis continue to grow among profit-oriented pharmaceutical as well as non-pharmaceutical companies. The health of patients, but also of other users, should be the priority of cannabis policies. Current anti-drug prohibitive drug policies aim to protect human health, but they fail to fulfil this purpose. However, commercialisation without any restrictions also does not serve the health of users.

When psychoactive substances are illegal, criminals have free rein and structure the market. When psychoactive substances are improperly regulated, profit-oriented companies have free rein as well. It is important for governments to strictly regulate the marketing of cannabis products offered in (web)stores, especially with regards to the current CBD hype. Many of these non-psychoactive CBD products are claimed to have therapeutic effects and are sold as being beneficial for specific conditions, while sound scientific evidence is lacking (Hazekamp, 2018; Hilderbrand, 2018). Descriptions of the cannabis products sold in online stores are almost personalised advertisements. In addition, previous studies show how cannabis extracts and cannabis-infused products sold in unregulated markets are labelled inaccurately and some may even contain harmful contaminants (Hazekamp, 2018; Barrus et al., 2016; Vandrey et al., 2015; Bonn-Miller et al., 2017). It is very likely that these misleading

advertisements will attract people and will influence their attitudes and buying behaviour regarding cannabis products. This may be particularly true for vulnerable populations who suffer from severe disabilities and who may see cannabis as their last hope. In the current unregulated market desperate patients can become easily the victim of fraudulent web stores.

Therefore, governments should cooperate to regulate the cannabis market and shut down stores and websites that are violating regulations regarding selling cannabis products as medicines and promising therapeutic benefits. It is vital to have an international approach, since consumers cross borders to purchase cannabis. For instance, Belgian patients obtain cannabis products in Dutch pharmacies and coffee shops, and order products online from countries abroad. In addition, the production and distribution of cannabis products also cross borders. For instance, the supply chain of CBD products is trans-national. The different supply chain stages are located in different countries to circumvent national legislations (Hazekamp, 2018). An international policy framework on medicinal cannabis is urgent to control exorbitantly high priced cannabinoid products and to ensure safety and quality to protect this vulnerable population.

It is the responsibility of policymakers and health authorities to disseminate accurate information to counterbalance false information and unevidenced claims about cannabis' therapeutic potential (e.g. panacea-like curative properties), that are currently inundating the internet (Shi et al., 2019). This implies that users as well as medical professionals have to be well-informed about the safety and efficacy of cannabis products. Information on dose, dose frequency, dose ranges, modes of administration, adverse effects, contraindications, drug interactions, etc. should be available to physicians and patients. In this way, users can make informed decisions. Education and training of physicians is currently lacking in Belgium. It is likely that regulating medical cannabis properly will improve education and social acceptance and will reduce stigma, as physicians will be more open to discuss it. The unregulated cannabis market also leads to medicalisation of cannabis, because of the many purported medical benefits of the substance. Since cannabis is currently in an illegal or legal grey zone, there is no counterweight to debunk the portrayal of cannabis as a utopian panacea. This study showed that cannabis is used for a wide range of different purposes. When recreational purposes of cannabis use remain viewed as improper and continue to have an illegal status, people might translate non-medical problems or sensations in medical ones to get legal access and to gain social acceptance.

Given the global trend towards less strict cannabis regimes, it is less likely that cannabis products will only be allowed for medical use in the future. This means that the legal position of cannabis can become different from other psychoactive substances regulated as medicines, such as opioids. The future will tell how these two concepts -medical and recreational cannabis use- will take shape, and how these two will relate. However, it is likely that there will be more nuance and diversity than this socially constructed dichotomy of 'recreational' versus 'medical'. Policy makers argue that it is important to consider recreational and approved medicinal cannabis use as two separate categories when regulating cannabis products. A recent draft motion for a resolution from one of the committees in the European parliament reads: "Calls on the Commission and national authorities [...] to draw a clear distinction

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between cannabis-based medicines approved by the EMA or other regulatory agencies, medical cannabis not supported by clinical trials, and other applications of cannabis (e.g. recreational or industrial)” (Committee on the Environment, Public Health and Food Safety, 2019, p. 4). Other researchers claim that without a clear distinction between recreational and therapeutic use it is impossible to develop two distinct strategies to approach the two distinct phenomena (Growing et al., 1998; Cairns & Kelly, 2017). In practice it is possible to make a clear distinction between recreational and medicinal cannabis use regarding approved cannabis products. For instance, by only considering tested cannabis derived or synthetic cannabinoid pharmaceuticals prescribed by physicians legitimate for medical use. However, the interview findings illustrate that self-identified medicinal cannabis users value the “natural” and “holistic” aspect of cannabis in contrast to “chemical” conventional medicines (cf. Pedersen & Sandberg, 2013). In addition, people growing their own plants and taking care of their own health might be empowering. Throughout this thesis it has become clear that it will require adaptive approaches to tackle these complex policy challenges.

Worldwide, many legal and policy constructions are set up to regulate herbal cannabis products for medical use, because of international law constrictions (e.g. Single Convention on Narcotic Drugs) and because cannabis does not fit the regular medical model. For instance, in many countries (e.g. Canada) physicians need to write recommendations instead of regular prescriptions for their patients in order for them to be able to obtain cannabis, particular products (e.g. herbal cannabis) cannot be delivered in regular pharmacies, a national agency has to be installed responsible for controlling and coordinating the supply of cannabis products, etc. We must await in which directions Belgian medicinal cannabis policies will develop. This includes the type of regulations and their implementation in practice. The persistent discrepancy between the wide range of self-reported medical purposes among the general population and the limited scientific evidence-base for efficacy and safety of cannabis, shapes current debates on future medicinal cannabis policies in Belgium. Recently, the establishment of a national governmental agency, coordinating the production and distribution of herbal cannabis, was approved by the Belgian government (FAGG, 2019). This is an important first step in cannabinoid research and the production of pharmaceutical grade cannabis products. However, in the short-term nothing changes for Belgian patients. They are still not allowed to purchase and consume herbal cannabis.

It is important that national and international medicinal cannabis policies are well-designed, evidence-based and that they are patient-centred. Regulatory authorities need to make a distinction between authorised cannabinoid medicines that have been tested for safety, efficacy and side effects in RCTs and cannabinoid products that have not (EMCDDA, 2018b). Patients should have access to safe and standardised cannabis products with a reproducible chemical profile. This requires tight quality control procedures and stringently monitored standardised production processes. For instance, within the EU, companies producing cannabinoid products for medical use could be required to comply with the European Medicines Agency's (EMA) good manufacturing practice (GMP) standards. This will result in high quality products free from adulterants and contaminants. Next, it is recommended that



cannabinoid products are consumable through accurate and replicable doses. The ingestion methods to administer cannabinoid products should be medically safe and precise.

Like conventional medicines, it is important that medical cannabinoid products are strictly regulated. These products should require a medical prescription to be dispensed, and this only through registered pharmacies. Other scholars suggest that policy makers appear to be concerned about the risks of deception by non-medical cannabis patients and the diversion of cannabis to non-medical contexts when medicinal cannabis would be legalised (Sznitman et al., 2016). However, the risk of drug diversion and deception is no different between cannabis and prescription drugs, such as painkillers and antidepressants (Dertadian, 2018; Reinerman, 2011). Still, diversion of medical cannabinoid products to non-medical circuits should be prevented at all times (Salomonsen-Sautel et al., 2012). The risk of diversion can be reduced by implementing good prescribing practices and prescription drug monitoring systems (Wood, 2015; Freeman et al., 2019a).

When medicinal cannabis regulations are implemented they will have to meet many criteria in order to succeed. High costs of cannabis, the absence of reimbursement, cumbersome administration processes, the lack of physicians' support, stigmatisation of cannabis use, uncertain availability, legal concerns, legal risks, low-quality cannabis products, a limited variety of cannabis products and ingestion methods, etc., are all risk factors of policy failures (Belle-Isle et al., 2014). If a medical cannabis program has too many barriers and is therefore insufficient, medicinal cannabis users will still access cannabis through other illicit or unregulated ways. In order to avoid that patients continue to purchase cannabis products from the black market it is key that the regulated products are affordable. In countries where medical grade cannabis preparations are legally available there is often a lack of reimbursement by (national) health insurance companies (EMCDDA, 2018b). It is important that expensive cannabinoid medicines are reimbursable. In addition, health care professionals' involvement in the implementation of medicinal cannabis policies in practice is essential in order for them to succeed.

#### *4.1 Conceptualisations of cannabis*

'Drugs' are not objective entities, instead their meaning is constructed through social, cultural and historical contexts (Cohen et al., 2001). It is valid to say that cannabinoid treatments differ from most conventional medicines, due their different historical, cultural and medical backgrounds. Cannabis has an ambiguous position in our society. Depending on the context, cannabis can be a recreational drug, wellness drug, therapeutic drug, spiritual drug, religious drug, nutrient, medicine, herb, food, fibre, etc. Today, cannabis does not seem to fit in one specific socially constructed category which presents theoretical and practical challenges (see Duff, 2016). Even on the micro level, people ascribe different meanings to cannabis.

In a medical context herbal cannabis has quite a unique position. While most pharmaceutical medicines have one active ingredient and are single target, cannabis contains multiple important cannabinoids,

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including THC and CBD, and many other compounds, such as the terpenes, that seem to affect the therapeutic potential of cannabis overall (Russo, 2011). The entourage or synergy effect between these compounds distinguishes the cannabis plant from many conventional medicines. Furthermore, the levels and proportions of these ingredients appear to be crucial for the therapeutic effects produced. The discovery of the importance of the chemical composition of cannabis has led to the production of a diversity of cannabinoid products. Alongside cannabis products' diverging cannabinoid composition, their forms and ingestion methods vary as well. No other therapeutic product has this many administration methods, going from inhalation, to sublingual, topical, oral and rectal administration. The findings of the present study show that different cannabis products and modes of consumption are used by one user, depending on the medical condition or symptom that has to be treated, and the context in which cannabis is used.

The term 'medical cannabis (use)' is generic and covers many products, with different chemical constellations ingested differently, supported by varying amounts of evidence on safety and efficacy. There is urgent need for a better suited terminology in the context of medical cannabis use. Specification is necessary in regulations, practice, research, but also in our communication and discourse. First of all, the term 'cannabis' can no longer be used as if it is one clear concept or product, since it covers many realities. The term is too broad because it covers a diversity of heterogeneous cannabis products (Duff, 2016). Cannabis comes in different shapes and forms, going from herbal varieties and derivatives to pharmaceutical cannabinoid drugs.

One important distinction is that between cannabinoid products that do not contain THC and products that do. It is important to distinguish pure CBD products from other cannabis products regarding their psychoactivity. Scientists, cannabis users, and in the meantime also politicians, are aware that CBD is a non-psychoactive cannabinoid. Participants in the present study were well aware of the functioning of the two cannabinoids THC and CBD. In future research into medicinal cannabis use it is important to make a differentiation between the psychoactive and non-psychoactive characteristics of medicinal cannabis users' products. At the same time, we should be careful not to overrate and overestimate the therapeutic value of CBD because it lacks psychoactivity and therefore is less stigmatised. Interviewees who used CBD exclusive products or products with high CBD levels referred to the fact that "*you cannot get high on these products*". Since CBD is a non-psychoactive component of cannabis, this statement is certainly plausible. However, the underlying motive for stating that their cannabis products do not induce a 'high' might also be because of the stigma associated with psychedelic effects. Emphasizing the fact that their cannabis products contain CBD might be because these products are less stigmatised than THC products. There is currently no solid scientific evidence for the wide-ranging uses of CBD (Hazekamp, 2018).

Next, for a long period terms such as 'medical cannabis', 'cannabinoid medicines', 'cannabis-based medicines', 'medicinal cannabis', 'medical cannabinoids', 'cannabis-based pharmaceutical drugs', etc. were used without a clear definition and many times interchangeably. Recently, policymakers started to realise that there is need for clear definitions of particular cannabis products in order to be able to

regulate them. A recent Draft motion for a resolution from one of the committees in the European parliament noted: “whereas products derived from cannabis that are used for medicinal purposes are broadly referred to as ‘medical cannabis’; whereas this term is largely undefined from a legal point of view and it remains ambiguous and open to interpretation; whereas the term ‘medical cannabis’ should be distinguished from cannabis-based medicines which have undergone clinical trials and have received regulatory approval” (Committee on the Environment, Public Health and Food Safety, 2019, p.4). However, this way, there is a risk of the monopolisation of the pharmaceutical industry and pharmaceuticalisation of medicinal cannabis, when only pharmaceutical drugs will be considered medicines and non-pharmaceutical drugs will be left out. This does not mean that there is no need for clear definitions and a more specific taxonomy and nomenclature. The differentiation of cannabis products, e.g. CBD products vs cannabis products with THC, herbal cannabis vs cannabis-based medicines, and medical vs recreational cannabis products, will likely change our view and discourse tremendously, and therefore it is likely that another reality regarding ‘cannabis’ will be constructed compared to a time not long ago.

## 5. Final remarks

The study findings of this thesis add to current knowledge regarding self-defined medicinal cannabis use. The present findings may contribute to a better understanding of cannabis use altogether. Despite the study’s limitations, it has important theoretical and practical implications. Several important conclusions can be drawn from the results.

First, my findings show that medical cannabis users are a highly heterogeneous population whose main aim was to achieve symptom relief through the use of cannabis. They also illustrate that there is a substantial overlap between recreational and medicinal cannabis use. Medicinal users who have experience with recreational cannabis use differ from people who have no such experience. My findings indicate that motives for recreational and medicinal cannabis use are intertwined and not mutually exclusive, but context dependent. As noted by Lancaster et al. (2017), I found overlaps between the types of pleasurable effects experienced by medicinal cannabis users. (Medical) cannabis research and policy debates should acknowledge pleasurable and desirable effects, by which we might look differently at the concepts of ‘medical’ and other types of drug use (Lancaster et al., 2017). While the relief of symptoms was the main self-reported reason to use cannabis, self-claimed medicinal cannabis users reported experiences of and motives for using cannabis moving beyond strictly medical purposes, and this was also true for individuals who claimed having never used cannabis recreationally or only have done so in the past.

Participants’ narratives show that the concept of medicinal cannabis use is subjective, personal and not easily defined. The terms ‘recreational’ and ‘medical’ cannabis use are fuzzy and complex concepts. This thesis does not necessarily give us the tools to define medicinal and recreational cannabis use, but

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it shows that using this multifaceted psychoactive substance for health purposes goes beyond the strict medical definition. The recognition of pleasure and holistic approaches are less common in Western medicine, whereas fragmentation, reductionism and dualism is often standard. Medicinal cannabis use moves beyond targeting one specific symptom as it affects patients' lives in various aspects. The study results show that cannabis can be used differently and adjusted depending on the context. This implies that the effects and experiences are also context dependent. It teaches us that not only is the substance itself determinative for the successfulness of a treatment, but also the user's personal characteristics and external factors such as the social context, are important to incorporate. This thesis shows that using cannabis for health purposes is complex and for every situation unique. Applying Zinberg's theory (1984) on substance, set and setting on medical drug use might be useful to learn more about medical drug use in general. The meaning of a psychoactive substance, such as cannabis, is not fixed and changes depending on the context in which and by whom it is used. Since, medicinal cannabis use is a complex phenomenon it poses challenges for policy and it requires complex and adaptive policy interventions.

By contrasting the concepts 'recreational' and 'medicinal' cannabis use, we might create an artificial and false dichotomy, a simplistic dichotomy of socially constructed categories that has real life consequences. Copes (2016, pp.194-195) argues that "by creating dichotomies such as "man" versus "woman," "powerful" versus "weak," and "functional" versus "dysfunctional," people can identify with one group, distance themselves from the other, and claim a position in a particular moral space". The dichotomy 'recreational' versus 'medicinal' might lead to the moral acceptability of medicinal cannabis use and the immoral unacceptability of recreational use, or the moral superiority of medicinal cannabis use. Language, categorisations and simplifications make everyday life and society easier to organise and to structure. Concepts are constructed through social experience and power relations, and have real-life consequences. Therefore, it is important to look critically at existing concepts and to allow nuance to break through these long-established categorisations. Concepts such as 'recreational' and 'problematic' cannabis use are neither objective nor neutral, but socially constructed and constantly being negotiated (Sandberg, 2012), and medicinal cannabis use is equally interpretative. As a result of the illegal status of cannabis, we are now confronted with an overly simplistic discourse in public and in policy. Pulling the medicinal side away as much as possible from the recreational side because of stigma, in medicine as well as in policy, might be unbeneficial for both types, as we would be ignoring certain realities.

The findings of my study provide new insights into the existing knowledge on medicinal cannabis use and valuable insights for future policy-making in (medicinal) cannabis regulations. Given the fact that national regulations are continuously shifting and being revised, it is important that the current blurred boundaries between medicinal and recreational use are acknowledged when implementing an international framework.

## References

- AbbVie Inc. (2015). Marinol, dronabinol capsules. Retrieved online on Januari, 19, 2016, from <http://www.marinol.com/>
- Ablin, J., Ste-Marie, P. A., Schäfer, M., Häuser, P. D. W., & Fitzcharles, M. A. (2016). Medical use of cannabis products. *Der Schmerz*, 1-10.
- Abraham, J. (2010). Pharmaceuticalization of society in context: theoretical, empirical and health dimensions. *Sociology*, 44(4), 603-622.
- Abrams, D. I., Vizoso, H. P., Shade, S. B., Jay, C., Kelly, M. E., & Benowitz, N. L. (2007). Vaporization as a smokeless cannabis delivery system: a pilot study. *Clinical Pharmacology & Therapeutics*, 82(5), 572-578.
- Abrams, D. I., Couey, P., Shade, S. B., Kelly, M. E., & Benowitz, N. L. (2011). Cannabinoid–opioid interaction in chronic pain. *Clinical Pharmacology & Therapeutics*, 90(6), 844-851.
- Abrams, D. I. (2018). The therapeutic effects of Cannabis and cannabinoids: An update from the National Academies of Sciences, Engineering and Medicine report. *European journal of internal medicine*, 49, 7-11.
- Abuhasira, R., Shbiro, L., & Landschaft, Y. (2018). Medical use of cannabis and cannabinoids containing products—Regulations in Europe and North America. *European journal of internal medicine*, 49, 2-6.
- Adler, J. N., & Colbert, J. A. (2013). Medicinal use of marijuana—polling results. *New England Journal of Medicine*, 368(22), 866-868.
- Aggarwal, S. K., Carter, G. T., Sullivan, M. D., ZumBrunnen, C., Morrill, R., & Mayer, J. D. (2009). Characteristics of patients with chronic pain accessing treatment with medical cannabis in Washington State. *Journal of opioid management*, 5(5), 257-286.
- Aggarwal, S. K., Carter, G. T., Sullivan, M. D., Zumbrunnen, C., Morrill, R., & Mayer, J. D. (2013). Prospectively surveying health-related quality of life and symptom relief in a lot-based sample of medical cannabis-using patients in urban Washington State reveals managed chronic illness and debility. *American Journal of Hospice and Palliative Medicine*, 30(6), 523-531.
- Allegretti, J. R., Courtwright, A., Lucci, M., Korzenik, J. R., & Levine, J. (2013). Marijuana use patterns among patients with inflammatory bowel disease. *Inflammatory bowel diseases*, 19(13), 2809-2814.
- Allan, G. M., Finley, C. R., Ton, J., Perry, D., Ramji, J., Crawford, K., Lindblad, A. J., Korownyk, C., & Kolber, M. R. (2018). Systematic review of systematic reviews for medical cannabinoids: Pain, nausea and vomiting, spasticity, and harms. *Canadian Family Physician*, 64(2), e78-e94.
- Anderson, L. (2017). *Deviance: Social Constructions and Blurred Boundaries*. Oakland, California: University of California Press.
- Andre, C. M., Hausman, J. F., & Guerriero, G. (2016). Cannabis sativa: the plant of the thousand and one molecules. *Frontiers in plant science*, 7(19), 1-17.
- Anney, V. N. (2014). Ensuring the quality of the findings of qualitative research: Looking at trustworthiness criteria. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS)*, 5(2), 272-281.
- Arendt, M., Rosenberg, R., Fjordback, L., Brandholdt, J., Foldager, L., Sher, L., & Munk-Jørgensen, P. (2007). Testing the self-medication hypothesis of depression and aggression in cannabis-dependent subjects. *Psychological medicine*, 37(7), 935-945.
- Athey, N., Boyd, N., & Cohen, E. (2017). Becoming a Medical Marijuana User: Reflections on Becker’s Trilogy—Learning Techniques, Experiencing Effects, and Perceiving Those Effects as Enjoyable. *Contemporary Drug Problems*, 44(3), 212-231.

## References

- Athey, N. C. (2018). *A profile of medical cannabis users residing in Canada and the United Kingdom: Accounting for policy and experience* (Doctoral dissertation, Arts & Social Sciences: School of Criminology).
- Babson, K. A., Boden, M. T., & Bonn-Miller, M. O. (2013). Sleep quality moderates the relation between depression symptoms and problematic cannabis use among medical cannabis users. *The American journal of drug and alcohol abuse*, *39*(3), 211-216.
- Bachhuber, M. A., Saloner, B., Cunningham, C. O., & Barry, C. L. (2014). Medical cannabis laws and opioid analgesic overdose mortality in the United States, 1999-2010. *JAMA internal medicine*, *174*(10), 1668-1673.
- Baggio, S., Deline, S., Studer, J., Mohler-Kuo, M., Daepfen, J. B., & Gmel, G. (2014). Routes of administration of cannabis used for nonmedical purposes and associations with patterns of drug use. *Journal of Adolescent Health*, *54*(2), 235-240.
- Bahn, S., & Weatherill, P. (2013). Qualitative social research: a risky business when it comes to collecting 'sensitive' data. *Qualitative Research*, *13*(1), 19-35.
- Bakalar, J. B., & Grinspoon, L. (1997). *Marihuana, the forbidden medicine*. New Haven: Yale University Press.
- Bardhi, F., Sifaneck, S. J., Johnson, B. D., & Dunlap, E. (2007). Pills, thrills and bellyaches: Case studies of prescription pill use and misuse among marijuana/blunt smoking middle class young women. *Contemporary drug problems*, *34*(1), 53-101.
- Barnes, R. E. (2000). Reefer madness: Legal & moral issues surrounding the medical prescription of marijuana. *Bioethics*, *14*(1), 16-41.
- Barrett, B., Marchand, L., Scheder, J., Plane, M. B., Maberry, R., Appelbaum, D., Rakel, D., & Rabago, D. (2003). Themes of holism, empowerment, access, and legitimacy define complementary, alternative, and integrative medicine in relation to conventional biomedicine. *The Journal of Alternative & Complementary Medicine*, *9*(6), 937-947.
- Barrus, D. G., Capogrossi, K. L., Cates, S. C., Gourdet, C. K., Peiper, N. C., Novak, S. P., Lefever, T. W., & Wiley, J. L. (2016). Tasty THC: promises and challenges of cannabis edibles. *Methods report* (RTI Press), 2016.
- Bar-Sela, G., Vorobeichik, M., Drawsheh, S., Omer, A., Goldberg, V., & Muller, E. (2013). The medical necessity for medicinal cannabis: prospective, observational study evaluating the treatment in cancer patients on supportive or palliative care. *Evidence-Based Complementary and Alternative Medicine*, *2013*, 1-8.
- Bayingana, K., Demarest, S., Gisle, L., Hesse, E., Miermans, P., Tafforeau, J. & Van der Heyden, J. (2004). *Gezondheidsenquête België 2004. Boek II Gezondheidstoestand*. WIV-ISP, Brussel, 2004.
- Bawin, F. (2019). Medicinal cannabis use: a fuzzy concept? In Kaló, Z. and Tieberghien, J. (Eds.) *Why? explanations for drug use and drug dealing in social drug research*. (pp. 155-170). Pabst Science Publishers
- Becker, H. S. (1953). Becoming a marihuana user. *American journal of Sociology*, *59*(3), 235-242.
- Becker, H. S. (1973). Consciousness, power and drug effects. *Society*, *10*(4), 26-31.
- Bell, S. E., & Figert, A. E. (2012). Medicalization and pharmaceuticalization at the intersections: Looking backward, sideways and forward. *Social Science & Medicine*, *75*(5), 775-783.
- Belle-Isle, L., & Hathaway, A. (2007). Barriers to access to medical cannabis for Canadians living with HIV/AIDS. *AIDS care*, *19*(4), 500-506.
- Belle-Isle, L., Walsh, Z., Callaway, R., Lucas, P., Capler, R., Kay, R., & Holtzman, S. (2014). Barriers to access for Canadians who use cannabis for therapeutic purposes. *International Journal of Drug Policy*, *25*(4), 691-699.
- Benyamin, R., Trescot, A. M., Datta, S., Buenaventura, R. M., Adlaka, R., Sehgal, N., Glaser, S. E., & Vallejo, R. (2008). Opioid complications and side effects. *Pain physician*, *11*, S105-S120.

## References

- Bergamaschi, M. M., Queiroz, R. H. C., Chagas, M. H. N., De Oliveira, D. C. G., De Martinis, B. S., Kapczinski, F., Quevedo, J., Roesler, R., Schröder, N., Nardi, A. E., Martín-Santos, R., Hallak, J. E. C., Zuardi, A. W. & Crippa, J. A. (2011). Cannabidiol reduces the anxiety induced by simulated public speaking in treatment-naïve social phobia patients. *Neuropsychopharmacology*, *36*(6), 1219-1226.
- Berger, N. P. (2015). The creative use of the ADHD diagnosis in probationers' self-narratives. *Journal of Scandinavian Studies in Criminology and Crime Prevention*, *16*(1), 122-139.
- Beyens, K., Christiaens, J., Claes, B., De Ridder, S., Tournel, H., & Tubex, H. (2013). *The pains of doing criminological research*. Brussel: VUBpress.
- Beyens, K., Kennes, P., Tournel, H. (2016). Mijnwerkers of ontdekkingsreizigers ? Het kwalitatief interview. In Decorte, T. & Zaitch, D. (Eds.) *Kwalitatieve methoden en technieken in de criminologie* (pp.188-222). Leuven: Acco.
- Bidwell, L. C., Mueller, R., YorkWilliams, S. L., Hagerty, S., Bryan, A. D., & Hutchison, K. E. (2018). A novel observational method for assessing acute responses to cannabis: preliminary validation using legal market strains. *Cannabis and cannabinoid research*, *3*(1), 35-44.
- Blenkinsopp, A., & Bradley, C. (1996). Over the Counter Drugs: Patients, society, and the increase in self medication. *Bmj*, *312*(7031), 629-632.
- Bloor, M., Fincham, B., & Sampson, H. (2010). Unprepared for the worst: Risks of harm for qualitative researchers. *Methodological Innovations Online*, *5*(1), 45-55.
- BMC (2018). *Medicinale Cannabis. Informatiebrochure voor artsen en apothekers*. Instituut Verantwoord Medicijngebruik en het Bureau voor Medicinale Cannabis (BMC) van het CIBG, ministerie van Volksgezondheid, Welzijn en Sport (VWS). Den Haag.
- Bobitt, J., Qualls, S. H., Schuchman, M., Wickersham, R., Lum, H. D., Arora, K., Milavetz, G., & Kaskie, B. (2019). Qualitative Analysis of Cannabis Use Among Older Adults in Colorado. *Drugs & aging*, *36*(7), 655-666.
- Bohnert, K. M., Bonar, E. E., Arnedt, J. T., Conroy, D. A., Walton, M. A., & Ilgen, M. A. (2018). Utility of the comprehensive marijuana motives questionnaire among medical cannabis patients. *Addictive behaviors*, *76*, 139-144.
- Boehnke, K. F., Litinas, E., & Clauw, D. J. (2016). Medical cannabis use is associated with decreased opiate medication use in a retrospective cross-sectional survey of patients with chronic pain. *The Journal of Pain*, *17*(6), 739-744.
- Boehnke, K. F., Scott, J. R., Litinas, E., Sisley, S., Williams, D. A., & Clauw, D. J. (2019). Pills to Pot: Observational Analyses of Cannabis Substitution Among Medical Cannabis Users With Chronic Pain. *The Journal of Pain*, *20*(7), 830-841.
- Bone, M., Potter, G., & Klein, A. (2018). Introduction: cultivation, medication, activism and cannabis policy. *Drugs and Alcohol Today*, *18*(2), 73-79.
- Bonn-Miller, M. O., Boden, M. T., Bucossi, M. M., & Babson, K. A. (2014). Self-reported cannabis use characteristics, patterns and helpfulness among medical cannabis users. *The American journal of drug and alcohol abuse*, *40*(1), 23-30.
- Bonn-Miller, M. O., Loflin, M. J., Thomas, B. F., Marcu, J. P., Hyke, T., & Vandrey, R. (2017). Labeling accuracy of cannabidiol extracts sold online. *Jama*, *318*(17), 1708-1709.
- Bonn-Miller, M. O., ElSohly, M. A., Loflin, M. J., Chandra, S., & Vandrey, R. (2018). Cannabis and cannabinoid drug development: evaluating botanical versus single molecule approaches. *International Review of Psychiatry*, *30*(3), 277-284.
- Booth, T., & Booth, W. (1994) The use of depth interviewing with vulnerable subjects: lessons from a research study of parents with learning difficulties. *Social Science & Medicine* *39*, 415-424.

## References

- Bostwick, J. M. (2012). Blurred boundaries: The therapeutics and politics of medical marijuana. *Mayo Clinic Proceedings*, 87(2), 172–186.
- Bostwick, J. M., Reisfield, G. M., & DuPont, R. L. (2013). Medicinal use of marijuana. *N Engl J Med*, 368(9), 866-8.
- Bottorff, J. L., Johnson, J. L., Moffat, B. M., & Mulvogue, T. (2009). Relief-oriented use of marijuana by teens. *Substance Abuse Treatment, Prevention, and Policy*, 4(7), 10.
- Bottorff, J. L., Bissell, L. J., Balneaves, L. G., Oliffe, J. L., Capler, N. R., & Buxton, J. (2013). Perceptions of cannabis as a stigmatized medicine: a qualitative descriptive study. *Harm reduction journal*, 10(2), 10.
- Bowles, D. W. (2012). Persons registered for medical marijuana in the United States. *Journal of Palliative Medicine*, 15(1), 9-11.
- Bradford, A. C., & Bradford, W. D. (2016). Medical marijuana laws reduce prescription medication use in Medicare Part D. *Health Affairs*, 35(7), 1230-1236.
- Braun, I. M., Wright, A., Peteet, J., Meyer, F. L., Yuppa, D. P., Bolcic-Jankovic, D., Le Blanc, J., Chang, Y., Yu, L., Nayak, M., M., Tulskey, J. A., Suzuki, J., Nabati, L., & Campbell, E., G. (2018). Medical oncologists' beliefs, practices, and knowledge regarding marijuana used therapeutically: a nationally representative survey study. *Journal of Clinical Oncology*, 36(19), 1957-1962.
- Bruenig, E. (2015). The Wonder Drug. Inside the medical marijuana industry's wild new frontier. September 27, 2015. New Republic. [http://www.newrepublic.com/article/122918/wonder-drug?utm\\_medium=email&utm\\_source=dig](http://www.newrepublic.com/article/122918/wonder-drug?utm_medium=email&utm_source=dig)
- Brunt, T. M., van Genugten, M., Höner-Snoeken, K., van de Velde, M. J., & Niesink, R. J. (2014). Therapeutic satisfaction and subjective effects of different strains of pharmaceutical-grade cannabis. *Journal of clinical psychopharmacology*, 34(3), 344-349.
- Buadze, A., Stohler, R., Schulze, B., Schaub, M., & Liebrez, M. (2010). Do patients think cannabis causes schizophrenia?-A qualitative study on the causal beliefs of cannabis using patients with schizophrenia. *Harm reduction journal*, 7(1), 22.
- Buckley, P. F. (2006). Prevalence and consequences of the dual diagnosis of substance abuse and severe mental illness. *The Journal of clinical psychiatry*, 67, 5-9.
- Buckner, J. D., Heimberg, R. G., Matthews, R. A., & Silgado, J. (2012). Marijuana-related problems and social anxiety: The role of marijuana behaviors in social situations. *Psychology of Addictive Behaviors*, 26(1), 151.
- Bundy, H., & Quintero, G. (2017). From mundane medicines to euphorogenic drugs: How pharmaceutical pleasures are initiated, foregrounded, and made durable. *International Journal of Drug Policy*, 49, 109-116.
- Cairns, E. A., & Kelly, M. E. (2017). Why support a separate medical access framework for cannabis?. *CMAJ*, 189(28), E927-E928.
- Capler, R., Walsh, Z., Crosby, K., Belle-Isle, L., Holtzman, S., Lucas, P., & Callaway, R. (2017). Are dispensaries indispensable? Patient experiences of access to cannabis from medical cannabis dispensaries in Canada. *International Journal of Drug Policy*, 47, 1-8.
- Carel, H. (2011). Phenomenology and its application in medicine. *Theoretical medicine and bioethics*, 32(1), 33-46.
- Cerdá, M., Sarvet, A. L., Wall, M., Feng, T., Keyes, K. M., Galea, S., & Hasin, D. S. (2018). Medical marijuana laws and adolescent use of marijuana and other substances: Alcohol, cigarettes, prescription drugs, and other illicit drugs. *Drug and alcohol dependence*, 183, 62-68.
- Chadwick, B., Miller, M. L., & Hurd, Y. L. (2013). Cannabis use during adolescent development: susceptibility to psychiatric illness. *Frontiers in psychiatry*, 4(129), 10.



## References

- Chan, G. C., Hall, W., Freeman, T. P., Ferris, J., Kelly, A. B., & Winstock, A. (2017). User characteristics and effect profile of Butane Hash Oil: An extremely high-potency cannabis concentrate. *Drug and alcohol dependence, 178*, 32-38.
- Chandra, S., Radwan, M. M., Majumdar, C. G., Church, J. C., Freeman, T. P., & ElSohly, M. A. (2019). New trends in cannabis potency in USA and Europe during the last decade (2008–2017). *European archives of psychiatry and clinical neuroscience, 269*(1), 5-15.
- Chapkis, W. (2007). Cannabis, consciousness, and healing. *Contemporary Justice Review, 10*(4), 443-460.
- Chapkis, W., & Webb, R. J. (2008). *Dying to get high: Marijuana as medicine*. New York: NYU Press.
- Charuvastra, A., Friedmann, P. D., & Stein, M. D. (2005). Physician attitudes regarding the prescription of medical marijuana. *Journal of addictive diseases, 24*(3), 87-93.
- Chen, L., & Michalsen, A. (2017). Management of chronic pain using complementary and integrative medicine. *Bmj, 357*, j1284.
- Chohan, H., Greenfield, A. L., Yadav, V., & Graves, J. (2016). Use of cannabinoids for spasticity and pain management in MS. *Current treatment options in neurology, 18*(1), 14.
- Cichewicz, D. L. (2004). Synergistic interactions between cannabinoid and opioid analgesics. *Life sciences, 74*(11), 1317-1324.
- Clark, A. J., Ware, M. A., Yazer, E., Murray, T. J., & Lynch, M. E. (2004). Patterns of cannabis use among patients with multiple sclerosis. *Neurology, 62*(11), 2098-2100.
- Clark, P. A., Capuzzi, K., & Fick, C. (2011). Medical marijuana: medical necessity versus political agenda. *Medical science monitor: international medical journal of experimental and clinical research, 17*(12), RA249.
- Clement, Y. N., Williams, A. F., Khan, K., Bernard, T., Bhola, S., Fortuné, M., Medupe, O., Nagee, K., & Seaforth, C. E. (2005). A gap between acceptance and knowledge of herbal remedies by physicians: the need for educational intervention. *BMC complementary and alternative medicine, 5*(1), 20.
- Clement, S., Schauman, O., Graham, T., Maggioni, F., Evans-Lacko, S., Bezborodovs, N., Morgan, C., Rüsch, N., Brown, J. S. L., & Thornicroft, G. (2014). What is the impact of mental health-related stigma on help-seeking? A systematic review of quantitative and qualitative studies. *Psychological medicine, 45*(1), 11-27.
- Cohen, D., McCubbin, M., Collin, J., & Pérodeau, G. (2001). Medications as social phenomena. *Health, 5*(4), 441-469.
- Cohen, P. J. (2010). Medical marijuana 2010: it's time to fix the regulatory vacuum. *The Journal of Law, Medicine & Ethics, 38*(3), 654-666.
- Coles, J., & Mudaly, N. (2010). Staying safe: Strategies for qualitative child abuse researchers. *Child Abuse Review: Journal of the British Association for the Study and Prevention of Child Abuse and Neglect, 19*(1), 56-69.
- Collen, M. (2012). Prescribing cannabis for harm reduction. *Harm reduction journal, 9*(1), 5.
- Conrad, P. (2007). *The Medicalization of Society: On the Transformation of Human Conditions into Treatable Disorders*. Baltimore, MD: The Johns Hopkins University Press.
- Conrad, P., & Barker, K. K. (2010). The social construction of illness: Key insights and policy implications. *Journal of health and social behavior, 51*(1\_suppl), S67-S79.
- Consroe, P., Musty, R., Rein, J., Tillery, W., & Pertwee, R. (1997). The perceived effects of smoked cannabis on patients with multiple sclerosis. *European neurology, 38*(1), 44-48.

## References

- Cook, J., Lloyd-Jones, D. M., Ogden, E., & Bonomo, Y. (2015). Medical use of cannabis: an addiction medicine perspective. *Internal medicine journal*, 45(6), 677-680.
- Coomber, R., Oliver, M., & Morris, C. (2003). Using cannabis therapeutically in the UK: A qualitative analysis. *Journal of Drug issues*, 33 (2), 325-356.
- Coomber, R., McElrath, K., Measham, F., & Moore, K. (2013). *Key concepts in drugs and society*. London: Sage.
- Copes, H. (2016). A narrative approach to studying symbolic boundaries among drug users: A qualitative meta-synthesis. *Crime, Media, Culture*, 12(2), 193-213.
- Corbin, J., & Morse, J. M. (2003). The unstructured interactive interview: Issues of reciprocity and risks when dealing with sensitive topics. *Qualitative inquiry*, 9(3), 335-354.
- Costa, B. (2007). On the Pharmacological Properties of  $\Delta^9$ -Tetrahydrocannabinol (THC). *Chemistry & biodiversity*, 4(8), 1664-1677.
- Cougle, J. R., Bonn-Miller, M. O., Vujanovic, A. A., Zvolensky, M. J., & Hawkins, K. A. (2011). Posttraumatic stress disorder and cannabis use in a nationally representative sample. *Psychology of Addictive Behaviors*, 25(3), 554-558.
- Coulter, I. D., & Willis, E. M. (2004). The rise and rise of complementary and alternative medicine: a sociological perspective. *Medical Journal of Australia*, 180(11), 587-589.
- Cranford, J. A., Bohnert, K. M., Perron, B. E., Bourque, C., & Ilgen, M. (2016). Prevalence and correlates of “Vaping” as a route of cannabis administration in medical cannabis patients. *Drug and alcohol dependence*, 169, 41-47.
- Crawford, P., Brown, B. & Majomi, P. (2008). Education as an Exit Strategy for Community Mental Health Nurses: A Thematic Analysis of Narratives. *Mental Health Review Journal*, 13(3), 8-15.
- Creswell, J. W., Plano Clark, V. L., Gutmann, M. L., & Hanson, W. E. (2003). Advanced mixed methods research designs. In Teddlie C. & Tashakkori A. (Eds.) *Handbook of mixed methods in social & behavioral research* (pp. 209-240). Thousand Oaks: Sage publications.
- Creswell, J. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks: Sage Publications, Incorporated.
- Creswell, J. W., & Clark, V. L. P. (2011). *Designing and conducting mixed methods research*. Los Angeles: Sage publications, Incorporated.
- Crippa, J. A. S., Zuardi, A. W., & Hallak, J. E. (2010). Therapeutical use of the cannabinoids in psychiatry. *Brazilian Journal of Psychiatry*, 32, 556-566.
- Crowther, S. M., Reynolds, L. A., & Tansey, E. M. (2010). *The medicalization of cannabis*. London: Wellcome Trust Centre for the History of Medicine.
- Dahl, H., & Frank, V. A. (2011). Medical marijuana – exploring the concept in relation to small scale cannabis growers in Denmark. In Decorte, T., Potter, G., & Bouchard, M. (Eds.), *World wide weed. Global trends in cannabis cultivation and its control* (pp. 116–141). Farnham: Ashgate.
- Dansie, E. J., & Turk, D. C. (2013). Assessment of patients with chronic pain. *British journal of anaesthesia*, 111(1), 19-25.
- Debas, H. T., Laxminarayan, R., & Straus, S. E. (2006). Complementary and alternative medicine. In Jamison D. T., Breman J.G., Measham A.R., et al. (Eds.) *Disease control priorities in developing countries*, 2<sup>nd</sup> ed (pp.1281-1291). Washington, DC: World Bank.
- Decorte, T. (2016). Kwalitatieve data-analyse. In Decorte, T. & Zaitch, D. (Eds.) *Kwalitatieve methoden en technieken in de criminologie* (pp.463-512). Leuven: Acco.

## References

- Decorte, T., Muys, M., & Slock, S. (2003). *Cannabis in vlaanderen. Patronen van cannabisgebruik bij ervaren gebruikers*. Leuven: Acco.
- Decorte, T., Malm, A., Sznitman, S. R., Hakkarainen, P., Barratt, M. J., Potter, G. R., Wersé, B., Kamphausen, G., Lenton, S. & Asmussen Frank, V. (2019). The challenges and benefits of analyzing feedback comments in surveys: Lessons from a cross-national online survey of small-scale cannabis growers. *Methodological Innovations*, 12(1), 1-16.
- De Donder, E. (2013). *Factsheet cannabis*. Brussel: VAD.
- Degenhardt, L., Lintzeris, N., Campbell, G., Bruno, R., Cohen, M., Farrell, M., & Hall, W. D. (2015). Experience of adjunctive cannabis use for chronic non-cancer pain: findings from the Pain and Opioids IN Treatment (POINT) study. *Drug and alcohol dependence*, 147, 144-150.
- de Hoop, B., Heerdink, E. R., & Hazekamp, A. (2018). Medicinal cannabis on prescription in the Netherlands: statistics for 2003–2016. *Cannabis and cannabinoid research*, 3(1), 54-55.
- Dertadian, G. C. (2018). *A Fine Line: painkillers and pleasure in the age of anxiety*. Singapore: Springer.
- DeSantis, A. D., & Hane, A. C. (2010). “Adderall is definitely not a drug”: justifications for the illegal use of ADHD stimulants. *Substance use & misuse*, 45(1-2), 31-46.
- Deshpande, A., Mailis-Gagnon, A., Zoheiry, N., & Lakha, S. F. (2015). Efficacy and adverse effects of medical marijuana for chronic noncancer pain. Systematic review of randomized controlled trials. *Canadian Family Physician*, 61(8), e372-e381.
- Dickson-Swift, V., James, E. L., Kippen, S., & Liamputtong, P. (2007). Doing sensitive research: what challenges do qualitative researchers face?. *Qualitative research*, 7(3), 327-353.
- Di Forti, M., Sallis, H., Allegrì, F., Trotta, A., Ferraro, L., Stilo, S. A., ... & Murray, R. M. (2013). Daily use, especially of high-potency cannabis, drives the earlier onset of psychosis in cannabis users. *Schizophrenia bulletin*, 40(6), 1509-1517.
- Doblin, R. E., & Kleiman, M. A. (1991). Marijuana as antiemetic medicine: a survey of oncologists' experiences and attitudes. *Journal of Clinical Oncology*, 9(7), 1314-1319.
- Drieskens S., Charafeddine R., Demarest S., Gisle L., Tafforeau J. & Van der Heyden J. (2014). Health Interview Survey, Belgium, 1997 - 2001 - 2004 - 2008 - 2013: *Health Interview Survey Interactive Analysis*. Brussels: WIV-ISP. <https://hisia.wiv-isp.be/4>
- Dryburgh, L. M., Bolan, N. S., Grof, C. P., Galettis, P., Schneider, J., Lucas, C. J., & Martin, J. H. (2018). Cannabis contaminants: sources, distribution, human toxicity and pharmacologic effects. *British journal of clinical pharmacology*, 84(11), 2468-2476.
- Duff, C. (2008). The pleasure in context. *International journal of drug policy*, 19(5), 384-392.
- Duff, C. (2016). Natures, cultures and bodies of cannabis. In Kolind, T., Thom, B., & Hunt, G. (Eds.). *The SAGE Handbook of Drug & Alcohol Studies: Social Science Approaches*. (pp. 679- 693). Los Angeles: Sage.
- Dwyer, R. (2008). Privileging pleasure: Temazepam injection in a heroin marketplace. *International Journal of Drug Policy*, 19(5), 367-374.
- Ebert, T., Zolotov, Y., Eliav, S., Ginzburg, O., Shapira, I., & Magnezi, R. (2015). Assessment of Israeli Physicians' Knowledge, Experience and Attitudes towards Medical Cannabis: A Pilot Study. *The Israel Medical Association journal: IMAJ*, 17(7), 437-441.
- Edland-Gryt, M., Sandberg, S., & Pedersen, W. (2017). From ecstasy to MDMA: Recreational drug use, symbolic boundaries, and drug trends. *International Journal of Drug Policy*, 50, 1-8.

## References

- Eisenberg, E., Ogintz, M., & Almog, S. (2014). The pharmacokinetics, efficacy, safety, and ease of use of a novel portable metered-dose cannabis inhaler in patients with chronic neuropathic pain: a phase 1a study. *Journal of pain & palliative care pharmacotherapy*, 28(3), 216-225.
- Ellickson, P. L., Martino, S. C., & Collins, R. L. (2004). Marijuana use from adolescence to young adulthood: Multiple developmental trajectories and their associated outcomes. *Health Psychology*, 23(3), 299-307.
- Elliott, C. (2004). *Better than well: American medicine meets the American dream*. New York: WW Norton & Company.
- Elliott, J., DeJean, D., Clifford, T., Coyle, D., Potter, B. K., Skidmore, B., Alexander, C., Repetski, A. E., Shukla, V., McCoy, B., & Wells, G. A. (2019). Cannabis-based products for pediatric epilepsy: A systematic review. *Epilepsia*, 60(1), 6-19.
- Elzinga, S., Fishedick, J., Podkolinski, R., & Raber, J. C. (2015). Cannabinoids and terpenes as chemotaxonomic markers in cannabis. *Nat. Prod. Chem. Res.*, 3(4), 9.
- EMCDDA (2018). *European Drug Report 2018: Trends and Developments*, Publications Office of the European Union, Luxembourg.
- EMCDDA (2018a). *Belgium Drug Report 2018*. Publications Office of the European Union, Luxembourg.
- EMCDDA (2018b). *Medical use of cannabis and cannabinoids*. Publications Office of the European Union, Luxembourg.
- EMCDDA (2019). *European Drug Report 2019: Trends and Developments*, Publications Office of the European Union, Luxembourg.
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics*, 5(1), 1-4.
- FAGG (2017). FAQ – Cannabis. Retrieved online on October, 18, 2018 from [https://www.fagg-afmps.be/sites/default/files/downloads/faq\\_cannabis\\_nl.pdf](https://www.fagg-afmps.be/sites/default/files/downloads/faq_cannabis_nl.pdf)
- FAGG (2019). FAQ – Cannabis. Retrieved online on May, 21, 2019 from [https://www.fagg-afmps.be/sites/default/files/content/INSP/NARC/faq\\_cannabis.pdf](https://www.fagg-afmps.be/sites/default/files/content/INSP/NARC/faq_cannabis.pdf)
- FAVV (2019). Vragen en antwoorden over het gebruik van cannabis sativa L. en cannabinoiden (zoals cannabidiol) als of in voedingsmiddelen. Retrieved online on July, 23, 2019 from <http://www.afsca.be/consumenten/dagelijksleven/andere/basiscannabishenep/>
- Feilzer, M. Y. (2010). Doing mixed methods research pragmatically: Implications for the rediscovery of pragmatism as a research paradigm. *Journal of mixed methods research*, 4(1), 6-16.
- Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed methods designs—principles and practices. *Health services research*, 48(6pt2), 2134-2156.
- Fischer, B., Murphy, Y., Kurdyak, P., Goldner, E., & Rehm, J. (2015). Medical marijuana programs—Why might they matter for public health and why should we better understand their impacts?. *Preventive medicine reports*, 2, 53-56.
- Fitzcharles, M. A., Ste-Marie, P. A., Clauw, D. J., Jamal, S., Karsh, J., LeClercq, S., McDougall, J. J., Shir, Y., Shojania, K., & Walsh, Z. (2014). Rheumatologists lack confidence in their knowledge of cannabinoids pertaining to the management of rheumatic complaints. *BMC musculoskeletal disorders*, 15(1), 258.
- Fitzcharles, M. A., Clauw, D. J., Ste-Marie, P. A., & Shir, Y. (2014a). The dilemma of medical marijuana use by rheumatology patients. *Arthritis care & research*, 66(6), 797-801.
- Fiz, J., Durán, M., Capellà, D., Carbonell, J., & Farré, M. (2011). Cannabis use in patients with fibromyalgia: effect on symptoms relief and health-related quality of life. *PLoS one*, 6(4), e18440.

## References

- Forero, R., Nahidi, S., De Costa, J., Mohsin, M., Fitzgerald, G., Gibson, N., McCarthy, S., & Aboagye-Sarfo, P. (2018). Application of four-dimension criteria to assess rigour of qualitative research in emergency medicine. *BMC health services research*, *18*(1), 120.
- Franke, A. G., Bagusat, C., Dietz, P., Hoffmann, I., Simon, P., Ulrich, R., & Lieb, K. (2013). Use of illicit and prescription drugs for cognitive or mood enhancement among surgeons. *BMC medicine*, *11*(102), 9.
- Freeman, T. P., & Winstock, A. R. (2015). Examining the profile of high-potency cannabis and its association with severity of cannabis dependence. *Psychological medicine*, *45*(15), 3181-3189.
- Freeman, T. P., Groshkova, T., Cunningham, A., Sedefov, R., Griffiths, P., & Lynskey, M. T. (2018). Increasing potency and price of cannabis in Europe, 2006–16. *Addiction*, *114*(6), 1015-1023.
- Freeman, T. P., Hindocha, C., Green, S. F., & Bloomfield, M. A. (2019). Medicinal use of cannabis based products and cannabinoids. *BMJ*, *365*, 11141.
- Freeman, T. P., & Lorenzetti, V. (2019). 'Standard THC Units': a proposal to standardise dose across all cannabis products and methods of administration. *Addiction*. (accepted for publication).
- Freeman, P. R., Curran, G. M., Drummond, K. L., Martin, B. C., Teeter, B. S., Bradley, K., ... & Edlund, M. J. (2019a). Utilization of prescription drug monitoring programs for prescribing and dispensing decisions: Results from a multi-site qualitative study. *Research in Social and Administrative Pharmacy*, *15*(6), 754-760.
- Furler, M. D., Einarson, T. R., Millson, M., Walmsley, S., & Bendayan, R. (2004). Medicinal and recreational marijuana use by patients infected with HIV. *AIDS patient care and STDs*, *18*(4), 215-228.
- GfK (2018). *Rookenquête 2018*. Een rapport voor Stichting tegen Kanker, uitgevoerd door GfK Belgium.
- Gisle, L. (2014). Gebruik van illegale drugs. In: Gisle L., Demarest S. (eds.). *Gezondheidsenquête 2013. Rapport 2: Gezondheidsgedrag en leefstijl*. WIV-ISP, Brussel, 2014.
- Gieringer, D. H. (2003). The acceptance of medicinal marijuana in the US. *Journal of Cannabis Therapeutics*, *3*(1), 53-65.
- Gieringer, D., St. Laurent, J., & Goodrich, S. (2004). Cannabis vaporizer combines efficient delivery of THC with effective suppression of pyrolytic compounds. *Journal of Cannabis Therapeutics*, *4*(1), 7-27.
- Goffman, E. (1963). *Stigma*. Englewood Cliffs, NJ: Prentice- Hall.
- Goode, E. (1972). *Drugs in American society*. New York: Knopf.
- Goulet-Stock, S., Rueda, S., Vafaei, A., Ialomiteanu, A., Manthey, J., Rehm, J., & Fischer, B. (2017). Comparing medical and recreational cannabis users on socio-demographic, substance and medication use, and health and disability characteristics. *European addiction research*, *23*(3), 129-135.
- Graham, S. S. (2011). Dis-ease or disease? Ontological rarefaction in the medical-industrial complex. *Journal of Medical Humanities*, *32*(3), 167-186.
- Grant, I., Atkinson, J. H., Gouaux, B., & Wilsey, B. (2012). Medical marijuana: clearing away the smoke. *The open neurology journal*, *6*, 18-25.
- Green, B. O. B., Kavanagh, D., & Young, R. (2003). Being stoned: a review of self-reported cannabis effects. *Drug and alcohol review*, *22*(4), 453-460.
- Greene, J. C., & Caracelli, V. J. (2003). Making paradigmatic sense of mixed methods practice. In Teddlie C. & Tashakkori A. (Eds.) *Handbook of mixed methods in social & behavioral research* (pp. 91-110). Thousand Oaks: Sage publications.
- Grella, C. E., Rodriguez, L., & Kim, T. (2014). Patterns of medical marijuana use among individuals sampled from medical marijuana dispensaries in Los Angeles. *Journal of psychoactive drugs*, *46*(4), 263-272.

## References

- Grinspoon, L. (1999). Medical marijuana in a time of prohibition. *International Journal of Drug Policy*, 10(2), 145-156.
- Grinspoon, L. (2000). Whither medical marijuana?. *Contemporary Drug Problems*, 27(1), 3-15.
- Grinspoon, L. (2010). Foreword. In Holland, J. (Ed.). *The pot book: A complete guide to cannabis*. (pp. 1-14). Simon and Schuster.
- Grotenhermen, F. (2001). Harm reduction associated with inhalation and oral administration of cannabis and THC. *Journal of Cannabis Therapeutics*, 1(3-4), 133-152.
- Grotenhermen, F., & Schnelle, M. (2003). Survey on the medical use of cannabis and THC in Germany. *Journal of Cannabis Therapeutics*, 3(2), 17-40.
- Grotenhermen, F., & Müller-Vahl, K. (2012). The therapeutic potential of cannabis and cannabinoids. *Deutsches Ärzteblatt International*, 109(29-30), 495-501.
- Growling, L. R., Ali R. L., Christie, P., White, J. M. (1998). Therapeutic use of cannabis: clarifying the debate. *Drug and Alcohol review* 17, 445-452.
- Guttmanova, K., Lee, C. M., Kilmer, J. R., Fleming, C. B., Rhew, I. C., Kosterman, R., & Larimer, M. E. (2016). Impacts of changing marijuana policies on alcohol use in the United States. *Alcoholism: Clinical and Experimental Research*, 40(1), 33-46.
- GW Pharmaceuticals (2016). Sativex. Retrieved online on January, 19, 2016 from <http://www.gwpharm.com/Sativex.aspx>
- Hakkarainen, P., Frank, V. A., Barratt, M. J., Dahl, H. V., Decorte, T., Karjalainen, K., Lention, S., Potter, G., & Werse, B. (2015). Growing medicine: Small-scale cannabis cultivation for medical purposes in six different countries. *International Journal of Drug Policy*, 26(3), 250-256.
- Hakkarainen, P., Decorte, T., Sznitman, S., Karjalainen, K., Barratt, M. J., Frank, V. A., Lenton, S., Potter, G., Werse, B., & Wilkins, C. (2019). Examining the blurred boundaries between medical and recreational cannabis—results from an international study of small-scale cannabis cultivators. *Drugs: Education, Prevention and Policy*, 26(3), 250-258.
- Hallstone, M. (2002). Updating Howard Becker's theory of using marijuana for pleasure. *Contemporary Drug Problems*, 29(4), 821-845.
- Hammersley, R., Jenkins, R., & Reid, M. (2001). Cannabis use and social identity. *Addiction Research & Theory*, 9(2), 133-150.
- Harvey, A. L. (2008). Natural products in drug discovery. *Drug discovery today*, 13(19-20), 894-901.
- Hathaway, A. D. (2004). Cannabis users' informal rules for managing stigma and risk. *Deviant behavior*, 25(6), 559-577.
- Hathaway, A. D., Comeau, N. C., & Erickson, P. G. (2011). Cannabis normalization and stigma: Contemporary practices of moral regulation. *Criminology & Criminal Justice*, 11(5), 451-469.
- Hazekamp, A., Sijrier, P., Verpoorte, R., Bender, J., & Bakel, N. (2005). Vergelijking van prijs, dronabinolgehalte en microbiologische kwaliteit. Cannabis uit de apotheek is beter. *Pharmaceutisch weekblad* 12, 402-404.
- Hazekamp, A. (2006). Een evaluatie van de kwaliteit van medicinale cannabis in Nederland. *Cannabinoids* 1(1).
- Hazekamp, A., & Fishedick, J. T. (2012). Cannabis—from cultivar to chemovar. *Drug testing and analysis*, 4(7-8), 660-667.
- Hazekamp, A., & Heerdink, E. R. (2013). The prevalence and incidence of medicinal cannabis on prescription in The Netherlands. *European journal of clinical pharmacology*, 69(8), 1575-1580.

## References

- Hazekamp, A., Ware, M. A., Muller-Vahl, K. R., Abrams, D. & Grotenhermen, F. (2013). The Medicinal Use of Cannabis and Cannabinoids- An International Cross-Sectional Survey on Administration Forms. *Journal of Psychoactive drugs*, 45(3), 1-12.
- Hazekamp, A., & Pappas, G. (2014). Self-medication with cannabis. In Pertwee, R. G. (Ed.). *Handbook of cannabis* (pp. 319-338). Oxford University Press, USA.
- Hazekamp, A. (2018). The trouble with CBD oil. *Medical cannabis and cannabinoids*, 1(1), 65-72.
- Henwood, B., & Padgett, D. K. (2007). Reevaluating the self-medication hypothesis among the dually diagnosed. *The American Journal on Addictions*, 16(3), 160-165.
- Hess, R. F. (2006). Postabortion research: methodological and ethical issues. *Qualitative Health Research*, 16(4), 580-587.
- Hilderbrand R. L. (2018). Hemp & Cannabidiol: What is a Medicine?. *Missouri medicine*, 115(4), 306–309.
- Hoch, E., Niemann, D., von Keller, R., Schneider, M., Friemel, C. M., Preuss, U. W., Hasan, A., & Pogarell, O. (2019). How effective and safe is medical cannabis as a treatment of mental disorders? A systematic review. *European archives of psychiatry and clinical neuroscience*, 269(1), 87-105.
- Holt, M., & Treloar, C. (2008). Pleasure and drugs. *International Journal of Drug Policy*, 19(5), 349-352.
- Houghton, C., Casey, D., Shaw, D., & Murphy, K. (2013). Rigour in qualitative case-study research. *Nurse researcher*, 20(4), 12-17.
- Howard, J., Anie, K. A., Holdcroft, A., Korn, S., & Davies, S. C. (2005). Cannabis use in sickle cell disease: a questionnaire study. *British journal of haematology*, 131(1), 123-128.
- Huber, M., Knottnerus, J. A., Green, L., van der Horst, H., Jadad, A. R., Kromhout, D., Leonard, B., Lorig, K., Loureiro, M. I., van der Meer, J. W. M., Schnabel, P., Smith, R., van Weel, C., & Smid, H. (2011). How should we define health?. *Bmj*, 343, d4163.
- Hughes, C. M., McElnay, J. C., & Fleming, G. F. (2001). Benefits and risks of self medication. *Drug safety*, 24(14), 1027-1037.
- Hurd, Y. L., Yoon, M., Manini, A. F., Hernandez, S., Olmedo, R., Ostman, M., & Jutras-Aswad, D. (2015). Early phase in the development of cannabidiol as a treatment for addiction: opioid relapse takes initial center stage. *Neurotherapeutics*, 12(4), 807-815.
- Ilgen, M. A., Bohnert, K., Kleinberg, F., Jannausch, M., Bohnert, A. S., Walton, M., & Blow, F. C. (2013). Characteristics of adults seeking medical marijuana certification. *Drug and alcohol dependence*, 132(3), 654-659.
- Izzo, A. A., Borrelli, F., Capasso, R., Di Marzo, V., & Mechoulam, R. (2009). Non-psychoactive plant cannabinoids: new therapeutic opportunities from an ancient herb. *Trends in pharmacological sciences*, 30(10), 515-527.
- Ivanovski, B., & Malhi, G. S. (2007). The psychological and neurophysiological concomitants of mindfulness forms of meditation. *Acta neuropsychiatrica*, 19(2), 76-91.
- Janichek, J. L., & Reiman, A. (2012). Clinical service desires of medical cannabis patients. *Harm reduction journal*, 9(12), 1-6.
- Jaques, S. C., Kingsbury, A., Henschke, P., Chomchai, C., Clews, S., Falconer, J., Abdel-Latif, M. E., Feller, J. M., & Oei, J. L. (2014). Cannabis, the pregnant woman and her child: weeding out the myths. *Journal of Perinatology*, 34(6), 417-424.
- Järvinen, M., & Demant, J. (2011). The normalisation of cannabis use among young people: Symbolic boundary work in focus groups. *Health, risk & society*, 13(2), 165-182.

## References

- Jett, J., Stone, E., Warren, G., & Cummings, K. M. (2018). Cannabis use, lung cancer, and related issues. *Journal of Thoracic Oncology*, *13*(4), 480-487.
- Jikomes, N., & Zoorob, M. (2018). The cannabinoid content of legal cannabis in Washington State varies systematically across testing facilities and popular consumer products. *Scientific reports*, *8*(1), 4519.
- Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational researcher*, *33*(7), 14-26.
- Jones, C., & Hathaway, A. D. (2008). Marijuana medicine and Canadian physicians: Challenges to meaningful drug policy reform. *Contemporary Justice Review*, *11*(2), 165-175.
- Kahan, M., Srivastava, A., Spithoff, S., & Bromley, L. (2014). Prescribing smoked cannabis for chronic noncancer pain: preliminary recommendations. *Canadian Family Physician*, *60*(12), 1083-1090.
- Kalant, H. (2001). Medicinal use of cannabis: history and current status. *Pain Research and Management*, *6*(2), 80-94.
- Kalant, H., & Porath-Waller, A. J. (2016). *Clearing the smoke on cannabis: Medical use of cannabis and cannabinoids*. An update. Ottawa: Canadian Centre on Substance Abuse.
- Karimi, A., Majlesi, M., & Rafieian-Kopaei, M. (2015). Herbal versus synthetic drugs; beliefs and facts. *Journal of nephro pharmacology*, *4*(1), 27-30.
- Kazantzis, N. P., Casey, S. L., Seow, P. W., Mitchell, V. A., & Vaughan, C. W. (2016). Opioid and cannabinoid synergy in a mouse neuropathic pain model. *British journal of pharmacology*, *173*, 251-253.
- Keane, H. (2008). Pleasure and discipline in the uses of Ritalin. *International Journal of Drug Policy*, *19*(5), 401-409.
- Kedzior, K. K., & Laeber, L. T. (2014). A positive association between anxiety disorders and cannabis use or cannabis use disorders in the general population-a meta-analysis of 31 studies. *BMC psychiatry*, *14*(1), 136.
- Kemper, E. A., Stringfield, S., & Teddlie, C. (2003). Mixed methods sampling strategies in social science research. In Teddlie C. & Tashakkori A. (Eds.) *Handbook of mixed methods in social & behavioral research* (pp. 273-296). Thousand Oaks: Sage publications.
- Kleber, H. D., & Dupont, R. L. (2012). Physicians and medical marijuana. *American Journal of Psychiatry*, *169*(6), 564-568.
- Klein, A., & Potter, G. R. (2018). The three betrayals of the medical cannabis growing activist: From multiple victimhood to reconstruction, redemption and activism. *International Journal of Drug Policy*, *53*, 65-72.
- Krippner, S. (2000). The epistemology and technologies of shamanic states of consciousness. *Journal of Consciousness Studies*, *7*(11-12), 93-118.
- Kondrad, E., & Reid, A. (2013). Colorado family physicians' attitudes toward medical marijuana. *The Journal of the American Board of Family Medicine*, *26*(1), 52-60.
- Kowal, M. A., Hazekamp, A., & Grotenhermen, F. (2016). Review on clinical studies with cannabis and cannabinoids 2010-2014. *Multiple sclerosis*, *6*(1515), 20.
- Kweskin, S. (2013). The dope on medical cannabis: Results of a survey of psychiatrists. *Psychiatric Times*, *30*(7), 11.
- Ladin, D. A., Soliman, E., Griffin, L., & Van Dross, R. (2016). Preclinical and clinical assessment of cannabinoids as anti-cancer agents. *Frontiers in pharmacology*, *7*, 361.
- Lamont, M. (1992). *Money, morals, and manners: The culture of the French and the American upper-middle class*. Chicago: University of Chicago Press.



## References

- Lamont, M., & Molnár, V. (2002). The study of boundaries in the social sciences. *Annual review of sociology*, 28(1), 167-195.
- Lancaster, K., Seear, K., & Ritter, A. (2017). Making medicine; producing pleasure: A critical examination of medicinal cannabis policy and law in Victoria, Australia. *International Journal of Drug Policy*, 49, 117-125.
- Lankenau, S., & Iverson, E. (2015). Medical marijuana: Stepping stone or protective effect?. *Drug & Alcohol Dependence*, 146, e167-e168.
- Lankenau, S. E., Ataiants, J., Mohanty, S., Schragger, S., Iverson, E., & Wong, C. F. (2018). Health conditions and motivations for marijuana use among young adult medical marijuana patients and non-patient marijuana users. *Drug and alcohol review*, 37(2), 237-246.
- Lankenau, S. E., Kioumars, A., Reed, M., McNeeley, M., Iverson, E., & Wong, C. F. (2018a). Becoming a medical marijuana user. *International Journal of Drug Policy*, 52, 62-70.
- Lau, N., Sales, P., Averill, S., Murphy, F., Sato, S. O., & Murphy, S. (2015). A safer alternative: Cannabis substitution as harm reduction. *Drug and alcohol review*, 34(6), 654-659.
- Lazareck, S., Robinson, J. A., Crum, R. M., Mojtabai, R., Sareen, J., & Bolton, J. M. (2012). A longitudinal investigation of the role of self-medication in the development of comorbid mood and drug use disorders: findings from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). *The Journal of clinical psychiatry*, 73(5), e588-e593.
- Lee, C. M., Neighbors, C., Hendershot, C. S., & Grossbard, J. R. (2009). Development and preliminary validation of a comprehensive marijuana motives questionnaire. *Journal of studies on alcohol and drugs*, 70(2), 279-287.
- Lenza, M. (2007). Toking their way sober: alcoholics and marijuana as folk medicine. *Contemporary Justice Review*, 10(3) 307-322.
- Leos-Toro, C., Shiplo, S., & Hammond, D. (2018). Perceived support for medical cannabis use among approved medical cannabis users in Canada. *Drug and alcohol review*, 37(5), 627-636.
- Leroux, E., Taifas, I., Valade, D., Donnet, A., Chagnon, M., & Ducros, A. (2012). Use of cannabis among 139 cluster headache sufferers. *Cephalalgia*, 33(3), 208-213.
- Lessenger, J. E., & Feinberg, S. D. (2008). Abuse of prescription and over-the-counter medications. *The Journal of the American Board of Family Medicine*, 21(1), 45-54.
- Leung, L. (2011). Cannabis and its derivatives: review of medical use. *The Journal of the American Board of Family Medicine*, 24(4), 452-462.
- Lewis, N., & Sznitman, S. R. (2017). You brought it on yourself: The joint effects of message type, stigma, and responsibility attribution on attitudes toward medical cannabis. *Journal of Communication*, 67(2), 181-202.
- Lin, L. A., Ilgen, M. A., Jannausch, M., & Bohnert, K. M. (2016). Comparing adults who use cannabis medically with those who use recreationally: Results from a national sample. *Addictive Behaviors*, 61, 99-103.
- Lincoln, Y. S. & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills: Sage.
- Link, B. G., Struening, E. L., Rahav, M., Phelan, J. C., & Nuttbrock, L. (1997). On stigma and its consequences: evidence from a longitudinal study of men with dual diagnoses of mental illness and substance abuse. *Journal of health and social behavior*, 38, 177-190.
- Lintzeris, N., Driels, J., Elias, N., Arnold, J. C., McGregor, I. S., & Allsop, D. J. (2018). Medicinal cannabis in Australia, 2016: the Cannabis as Medicine Survey (CAMS-16). *Medical Journal of Australia*, 209(5), 211-216.
- Loflin, M., Earleywine, M., & Bonn-Miller, M. (2017). Medicinal versus recreational cannabis use: Patterns of cannabis use, alcohol use, and cued-arousal among veterans who screen positive for PTSD. *Addictive Behaviors*, 68, 18-23.

## References

- López-Valero, I., Saiz-Ladera, C., Torres, S., Hernández-Tiedra, S., García-Taboada, E., Rodríguez-Fornés, F., Barba, M., Davila, D., Salvador-Tormo, N., Guzman, M., Sepúlveda, J. M., Sanchez-Gomez, P., Lorente, M., & Velasco, G. (2018). Targeting Glioma Initiating Cells with A combined therapy of cannabinoids and temozolomide. *Biochemical pharmacology*, *157*, 266-274.
- Lowe, D. J., Sasiadek, J. D., Coles, A. S., & George, T. P. (2019). Cannabis and mental illness: a review. *European archives of psychiatry and clinical neuroscience*, *269*(1), 107-120.
- Lu, H. C., & Mackie, K. (2016). An introduction to the endogenous cannabinoid system. *Biological psychiatry*, *79*(7), 516-525.
- Lucas, P. (2009). Moral regulation and the presumption of guilt in Health Canada's medical cannabis policy and practice. *International Journal of Drug Policy*, *20*(4), 296-303.
- Lucas, P. (2012). It can't hurt to ask; a patient-centered quality of service assessment of health canada's medical cannabis policy and program. *Harm reduction journal*, *9*(2), 1-11.
- Lucas, P., Reiman, A., Earleywine, M., McGowan, S. K., Oleson, M., Coward, M. P., & Thomas, B. (2013). Cannabis as a substitute for alcohol and other drugs: A dispensary-based survey of substitution effect in Canadian medical cannabis patients. *Addiction Research & Theory*, *21*(5), 435-442.
- Lucas, P., Walsh, Z., Crosby, K., Callaway, R., Belle-Isle, L., Kay, R., Capler, R., & Holtzman, S. (2016). Substituting cannabis for prescription drugs, alcohol and other substances among medical cannabis patients: the impact of contextual factors. *Drug and Alcohol Review*, *35*(3), 326-333.
- Lucas, P., & Walsh, Z. (2017). Medical cannabis access, use, and substitution for prescription opioids and other substances: a survey of authorized medical cannabis patients. *International Journal of Drug Policy*, *42*, 30-35.
- Lucas, P., Baron, E. P., & Jikomes, N. (2019). Medical cannabis patterns of use and substitution for opioids & other pharmaceutical drugs, alcohol, tobacco, and illicit substances; results from a cross-sectional survey of authorized patients. *Harm reduction journal*, *16*(9), 1-11.
- Lurigio, A. J. (2014). A Century of Losing Battles: The Costly and Ill-Advised War on Drugs in the United States. *Social Justice*, *21*, 1-60.
- MacCallum, C. A., & Russo, E. B. (2018). Practical considerations in medical cannabis administration and dosing. *European journal of internal medicine*, *49*, 12-19.
- Machado Rocha, F. C., Stefano, S. C., De Cassia Haiek, R., Rosa Oliveira, L. M. Q., & Da Silveira, D. X. (2008). Therapeutic use of Cannabis sativa on chemotherapy-induced nausea and vomiting among cancer patients: systematic review and meta-analysis. *European journal of cancer care*, *17*(5), 431-443.
- Madden, K., Middleton, P., Cyna, A. M., Matthewson, M., & Jones, L. (2016). Hypnosis for pain management during labour and childbirth. *Cochrane Database of Systematic Reviews*, (5).
- Maesschalck, J. (2016). Methodologische kwaliteit in het kwalitatief onderzoek. In Decorte, T. & Zaitch, D. (Eds.) *Kwalitatieve methoden en technieken in de criminologie* (pp.131-160). Leuven: Acco.
- Malan, T. P., Ibrahim, M. M., Lai, J., Vanderah, T. W., Makriyannis, A., & Porreca, F. (2003). CB 2 cannabinoid receptor agonists: pain relief without psychoactive effects?. *Current opinion in pharmacology*, *3*(1), 62-67.
- Malassiotis A., Fernandez-Ortega P., Pud D., Ozden G., Scott J.A., Panteli V., Margulies A., Browall M., Magri M., Selvekerova S., Madsen E., Milovics L., Bruyns I., Gudmundsdottir G., Hummerston S., Ahmad A.M-A., Platin N., Kearney N. & Patiraki E. (2005) Use of complementary and alternative medicine in cancer patients: a European survey. *Annals of Oncology*, *16*(4), 655–663.
- Marconi, A., Di Forti, M., Lewis, C. M., Murray, R. M., & Vassos, E. (2016). Meta-analysis of the association between the level of cannabis use and risk of psychosis. *Schizophrenia bulletin*, *42*(5), 1262-1269.

## References

- Maroon, J., & Bost, J. (2018). Review of the neurological benefits of phytocannabinoids. *Surgical neurology international*, 9(91), 1-33.
- Mascal, M., Hafezi, N., Wang, D., Hu, Y., Serra, G., Dallas, M. L., & Spencer, J. P. (2019). Synthetic, non-intoxicating 8, 9-dihydrocannabinidiol for the mitigation of seizures. *Scientific reports*, 9(7778), 1-6.
- McCabe, S. E., Boyd, C. J., & Teter, C. J. (2009). Subtypes of nonmedical prescription drug misuse. *Drug and alcohol dependence*, 102(1-3), 63-70.
- Mckenzie, S. K., Li, C., Jenkin, G., & Collings, S. (2017). Ethical considerations in sensitive suicide research reliant on non-clinical researchers. *Research ethics*, 13(3-4), 173-183.
- McLaren, J., Swift, W., Dillon, P., & Allsop, S. (2008). Cannabis potency and contamination: a review of the literature. *Addiction*, 103(7), 1100-1109.
- McPartland, J. (2000). Advantages of polypharmaceutical herbal Cannabis compared to single-ingredient, synthetic tetrahydrocannabinoid. In *3rd International Symposium, Bioresource Hemp, Proceedings of the "Bioresource Hemp*. Wolfsburg, Germany, Sept. 13–16, 2000. Nova Institute, Hürth.
- McPartland, J. M. (2017). Cannabis sativa and Cannabis indica versus “Sativa” and “Indica”. In Chandra, S., Lata, H., & ElSohly, M., (Eds.) *Cannabis sativa L.-botany and biotechnology* (pp. 101-121). Springer, Cham.
- Mechoulam, R. (2012). Cannabis—a valuable drug that deserves better treatment. *Mayo Clinic Proceedings*, 87(2), 107-109.
- Meda Pharmaceuticals Inc. (2016). Cesamet. Retrieved online on January, 15, 2016 from <https://www.mylan.com/en/products/product-catalog/product-profile-page?id=e525b1fd-36da-4ff5-8bd1-453cc72163ef>.
- Mikuriya, T. H. (2004). Cannabis as a substitute for alcohol: a harm-reduction approach. *Journal of Cannabis Therapeutics*, 4(1), 79-93.
- Ministerie van VWS & Instituut voor Verantwoord Medicijngebruik (2010). *Productieproces medicinale cannabis*. Webbrochure.
- Mitchell, F., Gould, O., LeBlanc, M., & Manuel, L. (2016). Opinions of hospital pharmacists in Canada regarding marijuana for medical purposes. *The Canadian Journal of Hospital Pharmacy*, 69(2), 122-130.
- Mitchell, J. T., Sweitzer, M. M., Tunno, A. M., Kollins, S. H., & McClernon, F. J. (2016a). “I use weed for my ADHD”: a qualitative analysis of online forum discussions on cannabis use and ADHD. *PLoS one*, 11(5), e0156614.
- Möbius, D., & De Donder, E. (2017). *Factsheet alcohol*. Brussel: VAD.
- Moncur, W. (2013, April). The emotional wellbeing of researchers: considerations for practice. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 1883-1890). ACM.
- Morean, M. E., Kong, G., Camenga, D. R., Cavallo, D. A., & Krishnan-Sarin, S. (2015). High school students’ use of electronic cigarettes to vaporize cannabis. *Pediatrics*, 136(4), 611-616.
- Morse, J. M. (2003). Principles of mixed methods and multimethod research design. In Teddlie, C. & Tashakkori, A. (Eds.) *Handbook of mixed methods in social & behavioral research* (pp. 189-208). Thousand Oaks: Sage publications.
- Mortelmans, D. (2013). *Handboek kwalitatieve onderzoeksmethoden*. Leuven: Acco
- Mouhamed, Y., Vishnyakov, A., Qorri, B., Sambhi, M., Frank, S. S., Nowierski, C., ... & Szewczuk, M. R. (2018). Therapeutic potential of medicinal marijuana: an educational primer for health care professionals. *Drug, healthcare and patient safety*, 10, 45-66.

## References

- Munsey, C. (2010). Medicine or menace: psychologists' research can inform the growing debate over legalizing marijuana. *Monitor on Psychology, 41*(6), 50-55.
- Murray, R. M., Morrison, P. D., Henquet, C., & Di Forti, M. (2007). Cannabis, the mind and society: the hash realities. *Nature Reviews Neuroscience, 8*(11), 885-895.
- Newhart, M. R. (2013). From Getting High to Getting Well: Identity and Legitimacy Issues among Midlife Medical Cannabis Patients in Colorado. *Sociology Graduate Theses & Dissertations, 31*.
- Newman, I., Ridenour, C. S., Newman, C., & DeMarco Jr, G. M. P. (2003). A typology of research purposes and its relationship to mixed methods. In Teddlie C. & Tashakkori A. (Eds.) *Handbook of mixed methods in social & behavioral research* (pp. 167-188). Thousand Oaks: Sage publications.
- Nielsen, S., Sabioni, P., Trigo, J. M., Ware, M. A., Betz-Stablein, B. D., Murnion, B., ... & Le Foll, B. (2017). Opioid-sparing effect of cannabinoids: a systematic review and meta-analysis. *Neuropsychopharmacology, 42*(9), 1752-1765.
- NIH (2015). Overdose Death Rates. Retrieved online on December 07, 2015 from <http://www.drugabuse.gov/related-topics/trends-statistics/overdose-death-rates>
- NIH (2015a). National institute on Drug Abuse. *Drug Facts: Prescription and Over-the-Counter Medications*. Retrieved online on January 18, 2015, from <http://www.drugabuse.gov/publications/drugfacts/prescription-over-counter-medications>
- Nolf, M. (2004). Medisch gebruik van cannabis: exploratief empirisch onderzoek bij geneesheren. *Panopticon, 25*(2), 135-154.
- Noppe, J., Vanweddigen, M., Doyen, G., Stuyck, K., Feys, Y., Buyschaert, P. (2018). *Vlaamse Migratie- en Integratiemonitor 2018*. Brussel: Agentschap Binnenlands Bestuur.
- Nunberg, H., Kilmer, B., Pacula, R. L., & Burgdorf, J. R. (2011). An analysis of applicants presenting to a medical marijuana specialty practice in California. *Journal of drug policy analysis, 4*(1), 1-14.
- O'Brien, P. K. (2013). Medical marijuana and social control: Escaping criminalization and embracing medicalization. *Deviant Behavior, 34*(6), 423-443.
- O'connell, T. J., & Bou-Matar, C. B. (2007). Long term marijuana users seeking medical cannabis in California (2001–2007): demographics, social characteristics, patterns of cannabis and other drug use of 4117 applicants. *Harm reduction journal, 4*(16).
- Ogborne, A. C., Smart, R., G., Weber, T., Birchmore-Timney, C. (2000) Who is Using Cannabis as a Medicine and Why: An Exploratory Study. *Journal of Psychoactive Drugs, 32*(4), 435-443.
- OMC (2019). Types of medicinal cannabis. Retrieved online on August, 5, 2019 from <https://english.cannabisbureau.nl/medicinal-cannabis/types-of-medicinal-cannabis>.
- Osborne, G. B., & Fogel, C. (2008). Understanding the motivations for recreational marijuana use among adult Canadians. *Substance use & misuse, 43*(3-4), 539-572.
- Pacula, R. L., Jacobson, M., & Maksabedian, E. J. (2016). In the weeds: a baseline view of cannabis use among legalizing states and their neighbours. *Addiction, 111*(6), 973-980.
- Page, S. A., Verhoef, M. J., Stebbins, R. A., Metz, L. M., & Levy, J. C. (2003). Cannabis use as described by people with multiple sclerosis. *Canadian journal of neurological sciences, 30*(3), 201-205.
- Page, S. A., & Verhoef, M. J. (2006). Medicinal marijuana use: experiences of people with multiple sclerosis. *Canadian Family Physician, 52*(1), 64-65.
- Pardal, M., & Bawin, F. (2018). The supply of cannabis for medical use through Cannabis Social Clubs in Belgium. *Contemporary Drug Problems, 45*(2), 127-145.

## References

- Patti, F., Messina, S., Solaro, C., Amato, M. P., Bergamaschi, R., Bonavita, S., ... & Zappia, M. (2016). Efficacy and safety of cannabinoid oromucosal spray for multiple sclerosis spasticity. *J Neurol Neurosurg Psychiatry*, *87*(9), 944-951.
- Pavlovic, R., Nenna, G., Calvi, L., Panseri, S., Borgonovo, G., Giupponi, L., Cannazza, G., & Giorgi, A. (2018). Quality traits of “cannabidiol oils”: cannabinoids content, terpene fingerprint and oxidation stability of European commercially available preparations. *Molecules*, *23*(5), 1230.
- Pedersen, W., & Sandberg, S. (2013). The medicalisation of revolt: a sociological analysis of medical cannabis users. *Sociology of health & illness*, *35*(1), 17-32.
- Pedersen, W. (2015). From badness to illness: Medical cannabis and self-diagnosed attention deficit hyperactivity disorder. *Addiction Research & Theory*, *23*(3), 177-186.
- Peretti-Watel, P. (2003). Neutralization theory and the denial of risk: some evidence from cannabis use among French adolescents. *The British journal of sociology*, *54*(1), 21-42.
- Perras, C. (2005). Sativex for the management of multiple sclerosis symptoms. *Issues in emerging health technologies*, (72), 1-4.
- Pertwee, R. G. (2009). Emerging strategies for exploiting cannabinoid receptor agonists as medicines. *British journal of pharmacology*, *156*(3), 397-411.
- Pieters, T., & Snelders, S. (2009). Psychotropic drug use: Between healing and enhancing the mind. *Neuroethics*, *2*(2), 63-73.
- Piper, B. J., DeKeuster, R. M., Beals, M. L., Cobb, C. M., Burchman, C. A., Perkinson, L., ... & Abess, A. T. (2017). Substitution of medical cannabis for pharmaceutical agents for pain, anxiety, and sleep. *Journal of Psychopharmacology*, *31*(5), 569-575.
- Piper, B. J. (2018). Mother of Berries, ACDC, or Chocolope: Examination of the strains used by medical cannabis patients in New England. *Journal of psychoactive drugs*, *50*(2), 95-104.
- Plos Medicine Editors. (2013). The paradox of mental health: Over-treatment and under-recognition. *PLoS Medicine*, *10*(5), e1001456. doi:10.1371/journal.pmed.1001456
- Porter, B. E., & Jacobson, C. (2013). Report of a parent survey of cannabidiol-enriched cannabis use in pediatric treatment-resistant epilepsy. *Epilepsy & Behavior*, *29*(3), 574-577.
- Prentiss, D., Power, R., Balmas, G., Tzuan, G., & Israelski, D. M. (2004). Patterns of marijuana use among patients with HIV/AIDS followed in a public health care setting. *JAIDS Journal of Acquired Immune Deficiency Syndromes*, *35*(1), 38-45.
- ProCon.org. (2016). 10 Pharmaceutical Drugs Based on Cannabis. Retrieved online on January, 19, 2016 from <http://medicalmarijuana.procon.org/view.resource.php?resourceID=000883>
- Punch, S. (2012). Hidden struggles of fieldwork: Exploring the role and use of field diaries. *Emotion, Space and Society*, *5*(2), 86-93.
- Rager, K. B. (2005). Self-care and the qualitative researcher: When collecting data can break your heart. *Educational Researcher*, *34*(4), 23-27.
- Reiman, A. E. (2008). Self-efficacy, social support and service integration at medical cannabis facilities in the San Francisco Bay area of California. *Health & social care in the community*, *16*(1), 31-41.
- Reiman, A. (2009). Cannabis as a substitute for alcohol and other drugs. *Harm Reduction Journal*, *6*(35).
- Reiman, A., Welty, M., & Solomon, P. (2017). Cannabis as a substitute for opioid-based pain medication: patient self-report. *Cannabis and cannabinoid research*, *2*(1), 160-166.

## References

- Reinarman, C. (2007). Policing pleasure: Food, drugs, and the politics of ingestion. *Gastronomica*, 7(3), 53-61.
- Reinarman, C., Nunberg, H., Lanthier, F. & Heddleston, T. (2011). Who are medical marijuana patients ? Population characteristics from nine California assessment clinics. *Journal of psychoactive drugs*, 43(2), 129-135.
- Romano, L. L., & Hazekamp, A. (2013). Cannabis oil: chemical evaluation of an upcoming cannabis-based medicine. *Cannabinoids*, 1(1), 1-11.
- Rosenthal, E., Mikuriya, T., & Gieringer, D. (1997). *Marijuana medical handbook: A guide to therapeutic use*. Quick American Archives.
- Rossi (2019). On aging cannabis users: a welfare economics analysis. In Kaló, Z. and Tieberghien, J. (Eds.) *Why? explanations for drug use and drug dealing in social drug research*. (pp-91-106). Pabst Science Publishers
- Rössler, W. (2016). The stigma of mental disorders. *EMBO reports*, 17(9), 1250-1253.
- Rowling, L. (1999). Being in, being out, being with: Affect and the role of the qualitative researcher in loss and grief research. *Mortality*, 4(2), 167-181.
- Roy-Byrne, P., Maynard, C., Bumgardner, K., Krupski, A., Dunn, C., West, I. I., Donovan, D., Atkins, D. C., & Ries, R. (2015). Are medical marijuana users different from recreational users? The view from primary care. *The American journal on addictions*, 24(7), 599-606.
- Ruiz, M. E. (2010). Risks of self-medication practices. *Current drug safety*, 5(4), 315-323.
- Russell, C., Rueda, S., Room, R., Tyndall, M., & Fischer, B. (2018). Routes of administration for cannabis use—basic prevalence and related health outcomes: A scoping review and synthesis. *International Journal of Drug Policy*, 52, 87-96.
- Russo, E. B. (2006). The solution to the medicinal cannabis problem. In Schatman, M. E. (Ed.). *Ethical issues chronic pain management*. (pp.165-194). Florida: Taylor & Francis.
- Russo, E. B. (2011). Taming THC: potential cannabis synergy and phytocannabinoid-terpenoid entourage effects. *British journal of pharmacology*, 163(7), 1344-1364.
- Russo, E. B., & Marcu, J. (2017). Cannabis pharmacology: the usual suspects and a few promising leads. In *Advances in pharmacology* (Vol. 80, pp. 67-134). Academic Press.
- Ryan, J., & Sharts-Hopko, N. (2017). The experiences of medical marijuana patients: a scoping review of the qualitative literature. *Journal of Neuroscience Nursing*, 49(3), 185-190.
- Salamonsen, A., Launsbø, L., Kruse, T. E., & Eriksen, S. H. (2010). Understanding unexpected courses of multiple sclerosis among patients using complementary and alternative medicine: A travel from recipient to explorer. *International journal of qualitative studies on health and well-being*, 5(2) 5032.
- Salomonsen-Sautel, S., Sakai, J. T., Thurstone, C., Corley, R., & Hopfer, C. (2012). Medical marijuana use among adolescents in substance abuse treatment. *Journal of the American Academy of Child & Adolescent Psychiatry*, 51(7), 694-702.
- Sandberg, S. (2012). Is cannabis use normalized, celebrated or neutralized? Analysing talk as action. *Addiction Research & Theory*, 20(5), 372-381.
- Sanders, J., Munford, R., Liebenberg, L., & Henaghan, M. (2014). Show some emotion? Emotional dilemmas in undertaking research with vulnerable youth. *Field Methods*, 26(3), 239-251.
- Satterlund, T. D., Lee, J. P., & Moore, R. S. (2015). Stigma among California's Medical Marijuana Patients. *Journal of psychoactive drugs*, 47(1), 10-17.
- Schauer, G. L., King, B. A., Bunnell, R. E., Promoff, G., & McAfee, T. A. (2016). Toking, vaping, and eating for health or fun: marijuana use patterns in adults, US, 2014. *American journal of preventive medicine*, 50(1), 1-8.

## References

- Schwartzman, J. (1988). Continuities and discontinuities in the family treatment of substance abuse. *Journal of Psychotherapy & The Family*, 3(3), 105-125.
- Sekar, K., & Pack, A. (2019). Epidiolex as adjunct therapy for treatment of refractory epilepsy: a comprehensive review with a focus on adverse effects. *F1000Research*, 8(234).
- Seneca, M. J. (2014) "Meta-Analysis of Herbal Cannabis Therapy for Chronic Pain". *UNF Theses and Dissertations*. Paper 503.
- Siegel, R. K. (2005). *Intoxication: The universal drive for mind-altering substances*. Rochester: Inner Traditions/Bear & Co.
- Sivell, S., Prout, H., Hopewell-Kelly, N., Baillie, J., Byrne, A., Edwards, M., ... & Nelson, A. (2019). Considerations and recommendations for conducting qualitative research interviews with palliative and end-of-life care patients in the home setting: a consensus paper. *BMJ supportive & palliative care*, 9(1), e14-e14.
- Schleider, L. B. L., Mechoulam, R., Lederman, V., Hilou, M., Lencovsky, O., Betzalel, O., Shbiro, L., & Novack, V. (2018). Prospective analysis of safety and efficacy of medical cannabis in large unselected population of patients with cancer. *European journal of internal medicine*, 49, 37-43.
- Shalit, R. (2012). Efficiency of psychotherapy involving altered states of consciousness: A call to reconsider our spiritual stance at the clinic. *International Body Psychotherapy Journal: The Art and Science of Somatic Praxis*, 11(2), 7-23.
- Shannon, S., Lewis, N., Lee, H., & Hughes, S. (2019). Cannabidiol in anxiety and sleep: a large case series. *The Permanente journal*, 23, 18-41.
- Shaw, I. F. (2003). Ethics in qualitative research and evaluation. *Journal of Social Work*, 3(1), 9-29.
- Shepard, G. H. (1998). Psychoactive plants and ethnopsychiatric medicines of the Matsigenka. *Journal of Psychoactive Drugs*, 30(4), 321-332.
- Sherman, R. E., Anderson, S. A., Dal Pan, G. J., Gray, G. W., Gross, T., Hunter, N. L., ... & Califf, R. M. (2016). Real-world evidence—what is it and what can it tell us. *N Engl J Med*, 375(23), 2293-2297.
- Shiplo (2015). *Marijuana use in Canada: Patterns of use among medical marijuana users* (Master's thesis, University of Waterloo).
- Śledziński, P., Zeyland, J., Słomski, R., & Nowak, A. (2018). The current state and future perspectives of cannabinoids in cancer biology. *Cancer medicine*, 7(3), 765-775.
- Small, M. L. (2011). How to conduct a mixed methods study: Recent trends in a rapidly growing literature. *Annual review of sociology*, 37, 57-86.
- Staniland, L. (2011). *Public perceptions of disabled people: Evidence from the British Social Attitudes Survey 2009*. Office for Disability Issues.
- Statbel (2018). *Kerncijfers. Statistisch overzicht van België 2018*. (Algemene Directie Statistiek - Statistics Belgium). Brussel- S000.02N/2018.
- State of Colorado (2015). Medical marijuana statistics and data. Medical Marijuana Registry Program Statistics. September 30, 2015. Retrieved on November, 28, 2015, from <https://www.colorado.gov/pacific/cdphe/medical-marijuana-statistics-and-data>
- Stockings, E., Zagic, D., Campbell, G., Weier, M., Hall, W. D., Nielsen, S., Herkes, G. K., Farell, M., & Degenhardt, L. (2018). Evidence for cannabis and cannabinoids for epilepsy: a systematic review of controlled and observational evidence. *J Neurol Neurosurg Psychiatry*, 89(7), 741-753.
- Stogner, J. M., & Miller, B. L. (2015). Assessing the dangers of “dabbing”: mere marijuana or harmful new trend?. *Pediatrics*, 136(1), 1-3.

## References

- Subbaraman, M. S. (2014). Can cannabis be considered a substitute medication for alcohol?. *Alcohol and Alcoholism*, 49(3), 292-298.
- Suh, J. J., Ruffins, S., Robins, C. E., Albanese, M. J., & Khantzian, E. J. (2008). Self-medication hypothesis: Connecting affective experience and drug choice. *Psychoanalytic psychology*, 25(3), 518.
- Sullivan, P. (2012). *MD Role in Use of Medical Marijuana Baffles Many Doctors: Survey*. [Online] [Canadian Medical Association]. Retrieved on February, 15, 2016 from Available at: <http://www.cma.ca/mdrole-medical-marijuana-baffles>.
- Swartz, R. (2010). Medical marijuana users in substance abuse treatment. *Harm Reduction Journal*, 7(1), 3.
- Swift, W., Gates, P., Dillon, P. (2005). Survey of Australians using cannabis for medical purposes. *Harm Reduction Journal*, 2(18).
- Sykes, G. M., & Matza, D. (1957). Techniques of neutralization: A theory of delinquency. *American sociological review*, 22(6), 664-670.
- Sznitman, S. R., & Taubman, D. S. (2016). Drug use normalization: a systematic and critical mixed-methods review. *Journal of studies on alcohol and drugs*, 77(5), 700-709.
- Sznitman, S. R., Goldberg, V., Sheinman-Yuffe, H., Flechter, E., & Bar-Sela, G. (2016). Storage and disposal of medical cannabis among patients with cancer: assessing the risk of diversion and unintentional digestion. *Cancer*, 122(21), 3363-3370.
- Sznitman, S. R. (2017). Do recreational cannabis users, unlicensed and licensed medical cannabis users form distinct groups?. *International Journal of Drug Policy*, 42, 15-21.
- Tafelski, S., Häuser, W., & Schäfer, M. (2016). Efficacy, tolerability, and safety of cannabinoids for chemotherapy-induced nausea and vomiting—a systematic review of systematic reviews. *Der Schmerz*, 30(1), 14-24.
- Tan, S. S. L., & Goonawardene, N. (2017). Internet health information seeking and the patient-physician relationship: a systematic review. *Journal of medical Internet research*, 19(1), e9.
- Tart, C. T. (2001). *On being stoned: A Psychological Study of Marijuana Intoxication*. Palo Alto, CA: Science and Behavior Books.
- Tashakkori, A., & Creswell, J. (2007). The new era of mixed methods. *Journal of Mixed Methods Research*, 1(1), 3-7.
- Taylor, S. (2008). Medicalizing cannabis—Science, medicine and policy, 1950–2004: An overview of a work in progress. *Drugs: education, prevention and policy*, 15(5), 462-474.
- Taylor, S. (2010) Re-medicalizing cannabis : science, medicine and policy, 1973 to the early twenty-first century. Doctoral thesis, London School of Hygiene Tropical Medicine.
- Teddlie, C., & Tashakkori, A. (2003). Major issues and controversies in the use of mixed methods in the social and behavioral sciences. In Teddlie C. & Tashakkori A. (Eds.) *Handbook of mixed methods in social & behavioral research* (pp. 3-50). Thousand Oaks: Sage publications.
- Trigo, J. M., Lagzdins, D., Rehm, J., Selby, P., Gamaledin, I., Fischer, B., ... & Le Foll, B. (2016). Effects of fixed or self-titrated dosages of Sativex on cannabis withdrawal and cravings. *Drug and alcohol dependence*, 161, 298-306.
- Troutt, W. D., & DiDonato, M. D. (2015). Medical Cannabis in Arizona: Patient Characteristics, Perceptions, and Impressions of Medical Cannabis Legalization. *Journal of psychoactive drugs*, 47(4), 259-266.
- Tupper, K. W. (2012). Psychoactive substances and the English language: “Drugs,” discourses, and public policy. *Contemporary Drug Problems*, 39(3), 461-492.



## References

- Turner, S. D., Spithoff, S., & Kahan, M. (2014). Approach to cannabis use disorder in primary care: Focus on youth and other high-risk users. *Canadian Family Physician, 60*(9), 801-808.
- United Nations (2018). *World Drug Report 2018* (United Nations publication, Sales No. E.18.XI.9).
- Uritsky, T. J., McPherson, M. L., & Pradel, F. (2011). Assessment of hospice health professionals' knowledge, views, and experience with medical marijuana. *Journal of palliative medicine, 14*(12), 1291-1295.
- van de Donk, T., Niesters, M., Kowal, M. A., Olofsen, E., Dahan, A., & van Velzen, M. (2019). An experimental randomized study on the analgesic effects of pharmaceutical-grade cannabis in chronic pain patients with fibromyalgia. *Pain, 160*(4), 860-869.
- Vander Laenen, F. & O'Gorman, A. (2016). Ethische aspecten van het kwalitatief onderzoek. In Decorte, T. & Zaitch, D. (Eds.) *Kwalitatieve methoden en technieken in de criminologie* (pp.555-586). Leuven: Acco.
- Van der Zee, K. I., & Sanderman, R. (2012). Het meten van de algemene gezondheidstoestand met de RAND-36, een handleiding (Manual SF-36, in Dutch). Noordelijk Centrum voor Gezondheidsvraagstukken. Groningen, Rijks Universiteit Groningen.
- Vandrey, R., Raber, J. C., Raber, M. E., Douglass, B., Miller, C., & Bonn-Miller, M. O. (2015). Cannabinoid dose and label accuracy in edible medical cannabis products. *Jama, 313*(24), 2491-2493.
- Vanhove, W., Cuypers, E., Bonneure, A. J., Gotink, J., Stassen, M., Tytgat, J., & Van Damme, P. (2018). The health risks of Belgian illicit indoor cannabis plantations. *Journal of forensic sciences, 63*(6), 1783-1789.
- Velasco, G., Sánchez, C., & Guzmán, M. (2016). Anticancer mechanisms of cannabinoids. *Current Oncology, 23*(Suppl 2), S23-S32.
- Verbeke, J., Heylens, G., Van Heeringen, C., Audenaert, K. (2005). Cannabis, roesmiddel en/of geneesmiddel: een overzicht. *Tijdschrift voor geneeskunde, 61*(9), 678-690.
- Vickers, K. A., Jolly, K. B., & Greenfield, S. M. (2006). Herbal medicine: women's views, knowledge and interaction with doctors: a qualitative study. *BMC complementary and alternative medicine, 6*(1), 40.
- Volkow, N. D., Swanson, J. M., Evins, A. E., DeLisi, L. E., Meier, M. H., Gonzalez, R., Bloomfield, M. A., Curran, V. H., & Baler, R. (2016). Effects of cannabis use on human behavior, including cognition, motivation, and psychosis: a review. *JAMA psychiatry, 73*(3), 292-297.
- Wadley, G. (2016). How psychoactive drugs shape human culture: A multi-disciplinary perspective. *Brain research bulletin, 126*, 138-151.
- Waissengrin, B., Urban, D., Leshem, Y., Garty, M., & Wolf, I. (2015). Patterns of use of medical cannabis among Israeli cancer patients: a single institution experience. *Journal of pain and symptom management, 49*(2), 223-230.
- Waldstein, A. (2010). Menace or medicine? Anthropological perspectives on the self-administration of high potency cannabis in the UK. *Drugs and Alcohol Today, 10*(3), 37-43.
- Walker, I. (2017). *High: Drugs, desire, and a nation of users*. Washington: University of Washington Press.
- Walsh, Z., Callaway, R., Belle-Isle, L., Capler, R., Kay, R., Lucas, P., & Holtzman, S. (2013). Cannabis for therapeutic purposes: patient characteristics, access, and reasons for use. *International Journal of Drug Policy, 24*(6), 511-516.
- Wang, T., Collet, J. P., Shapiro, S., & Ware, M. A. (2008). Adverse effects of medical cannabinoids: a systematic review. *Canadian Medical Association Journal, 178*(13), 1669-1678.
- Ware, M. A., Rueda, S., Singer, J., & Kilby, D. (2003). Cannabis use by persons living with HIV/AIDS: patterns and prevalence of use. *Journal of Cannabis Therapeutics, 3*(2), 3-15.

## References

- Ware, M. A., Doyle, C. R., Woods, R., Lynch, M. E., & Clark, A. J. (2003a). Cannabis use for chronic non-cancer pain: results of a prospective survey. *Pain*, 102(1-2), 211-216.
- Ware, M. A., Adams, H., & Guy, G. W. (2005). The medicinal use of cannabis in the UK: results of a nationwide survey. *International journal of clinical practice*, 59(3), 291-295.
- Ware, M. A., Wang, T., Shapiro, S., Robinson, A., Ducruet, T., Huynh, T., Gamsa, A., Bennett, G. J., & Collet, J. P. (2010). Smoked cannabis for chronic neuropathic pain: a randomized controlled trial. *Canadian Medical Association Journal*, 182(14), E694-E701.
- Webb, C. W., & Webb, S. M. (2014). Therapeutic benefits of cannabis: a patient survey. *Hawai'i Journal of Medicine & Public Health*, 73(4), 109-111.
- Weiss, A., & Friedenberg, F. (2015). Patterns of cannabis use in patients with inflammatory bowel disease: a population based analysis. *Drug and alcohol dependence*, 156, 84-89.
- Whiting, P. F., Wolff, R. F., Deshpande, S., Di Nisio, M., Duffy, S., Hernandez, A. V., ... & Schmidtkofer, S. (2015). Cannabinoids for medical use: a systematic review and meta-analysis. *Jama*, 313(24), 2456-2473.
- Wilkinson, S. T., & D'Souza, D. C. (2014). Problems with the medicalization of marijuana. *Jama*, 311(23), 2377-2378.
- Winkelman, M. J. (2007). Therapeutic bases of psychedelic medicines: psychointegrative effects. *Psychedelic Medicine: new evidence for hallucinogenic substances as treatments*. Westport, Connecticut: Praeger, 1, 1-19.
- Wood, D. (2015). Drug diversion. *Australian prescriber*, 38(5), 164-166.
- Woolridge, E., Barton, S., Samuel, J., Osorio, J., Dougherty, A., & Holdcroft, A. (2005). Cannabis use in HIV for pain and other medical symptoms. *Journal of pain and symptom management*, 29(4), 358-367.
- Young, M., Stuber, J., Ahern, J., & Galea, S. (2005). Interpersonal discrimination and the health of illicit drug users. *The American journal of drug and alcohol abuse*, 31(3), 371-391.
- Zaller, N., Topletz, A., Frater, S., Yates, G., & Lally, M. (2015). Profiles of medicinal cannabis patients attending compassion centers in Rhode Island. *Journal of psychoactive drugs*, 47(1), 18-23.
- Ziemianski, D., Capler, R., Tekanoff, R., Lacasse, A., Luconi, F., & Ware, M. A. (2015). Cannabis in medicine: a national educational needs assessment among Canadian physicians. *BMC medical education*, 15(1), 52.
- Zinberg, N. E. (1984). *Drug, set, and setting: The basis for controlled intoxicant use*. New Haven: Yale University Press.
- Zolotov, Y., Baruch, Y., Reuveni, H., & Magnezi, R. (2016). Adherence to Medical Cannabis Among Licensed Patients in Israel. *Cannabis and Cannabinoid Research*, 1(1), 16-21.
- Zuardi, A. W. (2006). History of cannabis as a medicine: a review. *Brazilian Journal of Psychiatry*, 28(2), 153-157.
- Zuardi, A. W., de Souza Crippa, J. A., Hallak, J. E. C., Campos, A. C., & Guimarães, F. S. (2017). The anxiolytic effects of Cannabidiol (CBD). In *Handbook of Cannabis and Related Pathologies* (pp. e131-e139). Academic Press.

# Appendix

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Appendix 1: Tables

Appendix 2: Online questionnaire

Appendix 3: Informed consent

## Appendix 1: Tables

### 1. Medicinal cannabis users' profiles

#### 1.1 Sociodemographic characteristics

**Table 1a: Sociodemographic characteristics of the survey sample**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical	Previous recreational	Current recreational	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	p
<b>Age mean (SD)</b>	48.5 (11.8)	39.36 (10.9)	38.44 (10.9)			<0.001			<0.001			1
<b>Gender</b>												
Female	56 (69.1)	43 (44.8)	39 (21.2)	2.761	1.486-5.131	0.001	8.328	4.620-15.013	<0.001	3.016	1.766-5.153	<0.001
Male	25 (30.9)	53 (55.2)	145 (78.8)	1			1			1		
<b>Relationship status</b>												
Partner	58 (74.4)	54 (57.4)	110 (60.8)	2.148	1.119-4.124	0.021	1.872	1.038-3.375	0.036	0.871	0.525-1.446	0.594
No partner	20 (25.6)	40 (42.6)	71 (39.2)	1			1			1		
<b>Employment</b>												
Employed	31 (39.7)	34 (36.6)	102 (57.3)	1.145	0.616-2.127	0.669	0.491	0.286-0.845	0.010	0.429	0.256-0.719	0.001
Unemployed	47 (60.3)	59 (63.4)	76 (42.7)	1			1			1		
<b>Household income</b>												
Less than 2000 EUR	31 (47.7)	53 (59.6)	93 (53.1)	0.619	0.325-1.180	0.144	0.804	0.445-1.422	0.453	1.298	0.774-2.177	0.322
2000 EUR or more	34 (52.3)	36 (40.4)	82 (46.9)	1			1			1		
<b>Education</b>												
High school or less	46 (61.3)	63 (68.5)	123 (73.2)	0.730	0.385-1.385	0.335	0.580	0.326-1.033	0.063	0.795	0.455-1.387	0.418
Bachelor or higher	29 (38.7)	29 (31.5)	45 (26.8)	1			1			1		

Tested using a Kruskal-Wallis test for ratio variable and post hoc pair wise tests Bonferroni at a  $p < 0.05$ . The Chi<sup>2</sup> test was used for nominal variables, tested at a significance level of  $p < 0.017$ .

*1.2 Drug use***Table 2a: Survey participants' lifetime substance use**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical N=75	Previous recreational N=84	Current recreational N=171	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	p
<b>Alcohol</b>												
No	34 (45.3)	15 (17.9)	20 (11.7)	3.815	1.857-7.837	<0.001	6.261	3.264-12.009	<0.001	1.641	0.793-3.397	0.179
Yes	41 (54.7)	69 (82.1)	151 (88.3)	1			1			1		
<b>Cigarettes (tobacco)</b>												
No	42 (56.0)	14 (16.7)	29 (17.0)	6.364	3.058-13.243	<0.001	6.232	3.399-11.425	<0.001	0.979	0.487-1.970	0.953
Yes	33 (44.0)	70 (83.3)	142 (83.0)	1			1			1		
<b>LSD</b>												
No	74 (98.7)	57 (67.9)	102 (59.6)	35.053	4.624-265.72	<0.001	50.059	6.797-368.659	<0.001	1.428	0.824-2.476	0.204
Yes	1 (1.3)	27 (32.1)	69 (40.4)	1			1			1		
<b>Cocaine</b>												
No	74 (98.7)	47 (56.0)	85 (49.7)	58.255	7.731-438.98	<0.001	74.871	10.175-550.906	<0.001	1.285	0.760-2.172	0.348
Yes	1 (1.3)	37 (44.0)	86 (50.3)	1			1			1		
<b>Amphetamines</b>												
No	73 (97.3)	55 (65.5)	97 (56.7)	19.245	4.403-84.124	<0.001	27.845	6.617-117.171	<0.001	1.447	0.841-2.488	0.181
Yes	2 (2.7)	29 (34.5)	74 (43.3)	1			1			1		
<b>Methamphetamines</b>												
No	75 (100)	79 (94.0)	163 (95.3)	/	/	/	/	/	/	0.775	0.246-2.447	0.664
Yes	0 (0)	5 (6.0)	8 (4.7)	1			1			1		
<b>MDMA</b>												
No	73 (97.3)	57 (67.9)	91 (53.2)	17.289	3.946-75.762	<0.001	32.088	7.629-134.963	<0.001	1.856	1.073-3.209	0.026
Yes	2 (2.7)	27 (32.1)	80 (46.8)	1			1			1		
<b>GHB</b>												
No	75 (100)	74 (88.1)	158 (92.4)	/	/	/	/	/	/	0.609	0.255-1.452	0.260
Yes	0 (0)	10 (11.9)	13 (7.6)	1			1			1		
<b>Heroin</b>												
No	74 (98.7)	75 (89.3)	156 (91.2)	8.880	1.097-71.851	0.015	7.115	0.922-54.889	0.029	0.801	0.335-1.915	0.618
Yes	1 (1.3)	9 (10.7)	15 (8.8)	1			1			1		
<b>Psilocybin</b>												
No	74 (98.7)	60 (71.4)	87 (50.9)	29.600	3.891-225.18	<0.001	71.448	9.710-525.728	<0.001	2.414	1.378-4.227	0.002
Yes	1 (1.3)	24 (28.6)	84 (49.1)	1			1			1		

Appendix

<b>Methadone</b>												
No	75 (100)	81 (96.4)	166 (97.1)	/	/	/	/	/	/	0.813	0.190-3.487	0.780
Yes	0 (0)	3 (3.6)	5 (2.9)	1			1			1		
<b>Ketamine</b>												
No	73 (97.3)	70 (83.3)	144 (84.2)	7.300	1.601-33.292	0.003	6.844	1.584-29.577	0.003	0.938	0.463-1.899	0.858
Yes	2 (2.7)	14 (16.7)	27 (15.8)	1			1			1		
<b>Synthetic cannabinoids</b>												
No	74 (98.7)	83 (98.8)	162 (94.7)	0.892	0.055-14.508	0.936	4.111	0.511-33.046	0.151	4.611	0.574-37.015	0.115
Yes	1 (1.3)	1 (1.2)	9 (5.3)	1			1			1		
<b>Other opioids</b>												
No	74 (98.7)	82 (97.6)	156 (91.2)	1.805	0.160-20.316	0.628	7.115	0.922-54.889	0.029	3.942	0.880-17.658	0.054
Yes	1 (1.3)	2 (2.4)	15 (8.8)	1			1			1		
<b>Tranquilizers</b>												
No	74 (98.7)	72 (85.7)	132 (77.2)	12.333	1.563-97.134	0.003	21.864	2.943-162.400	<0.001	1.773	0.873-3.598	0.110
Yes	1 (1.3)	12 (14.3)	39 (22.8)	1			1			1		

Tested using Chi<sup>2</sup> test at a significance level of p<0.017.

**Table 2b: Survey participants' lifetime use of illicit psychoactive substances**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical	Previous recreational	Current recreational	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	P
	N=75	N=84	N=171									
<b>Number of illicit psychoactive substances. Mean (SD)</b>	0.15 (0.940)	2.21 (2.777)	2.75 (2.537)			<0.001			<0.001			0.119
<b>Ever use of illicit psychoactive substances other than cannabis</b>												
No	71 (94.7)	40 (47.6)	55 (32.2)	19.525	6.536-58.331	<0.001	37.436	13.008-107.741	<0.001	1.917	1.123-3.274	0.016
Yes	4 (5.3)	44 (52.4)	116 (67.8)	1			1			1		

Tested using a Kruskal-Wallis test for ratio variable and post hoc pair wise tests Bonferroni at a p<0.05. The Chi<sup>2</sup> test was used for nominal variables, tested at a significance level of p<0.017.

**Table 5a: Survey participants who replace other substances (partially or completely) with cannabis**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical N=81	Previous recreational N=96	Current recreational N=184	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	P
<b>Alcohol substitution: no</b>	80 (98.8)	91 (94.8)	146 (79.3)	4.396	0.503-38.42	0.146	20.82	2.806-154.504	<0.001	4.737	1.798-12.48	0.001
Yes	1 (1.2)	5 (5.2)	38 (20.7)	1			1			1		
<b>Medicines substitution: no</b>	27 (33.3)	42 (43.8)	95 (51.6)	0.643	0.348-1.187	0.157	0.468	0.272-0.808	0.006	0.729	0.444-1.197	0.211
Yes	54 (66.7)	54 (56.3)	89 (48.4)	1			1			1		
<b>Cigarettes substitution: no</b>	80 (98.8)	88 (91.7)	155 (84.2)	7.273	0.890-59.44	0.032	14.97	2.002-111.893	0.001	2.058	0.902-4.698	0.081
Yes	1 (1.2)	8 (8.3)	29 (15.8)	1			1			1		
<b>Illicit drugs: no</b>	80 (98.8)	94 (97.9)	168 (91.3)	1.702	0.152-19.12	0.663	7.619	0.993-58.464	0.022	4.476	1.007-19.89	0.032
Yes	1 (1.2)	2 (2.1)	16 (8.7)	1			1			1		
<b>Not using cannabis as a substitute: no</b>	57 (70.4)	60 (62.5)	111 (60.3)	1.425	0.758-2.678	0.270	1.562	0.891-2.737	0.118	1.096	0.660-1.821	0.723
Yes	24 (29.6)	36 (37.5)	73 (39.7)	1			1			1		

Tested using Chi<sup>2</sup> test at a significance level of p<0.017.

### 1.3 Medical conditions and symptoms

**Table 6a: Survey participants' medical conditions and symptoms**

	Exclusive medical	Previous recreational	Current recreational	Exclusive medical vs previous recreational	Exclusive medical vs current recreational	Previous recreational vs current recreational
				p	p	P
<b>Conditions</b>						
<b>Uses cannabis for a medical condition, n (%)</b>	71 (87.7)	84 (95.5)	150 (89.3)	0.066	0.703	0.094
Uses cannabis for a psychological condition, n (%)	24 (34.3)	53 (63.1)	108 (72.0)	<0.001	<0.001	0.158
Uses cannabis for a physical condition, n (%)	67 (95.7)	74 (88.1)		0.090	0.006	0.220
<b>Number of medical conditions per participant, mean (SD)</b>	3.43 (2.49)	3.81 (2.96)	3.84 (2.50)	0.407 (no pairwise comparisons)	0.407 (no pairwise comparisons)	0.407 (no pairwise comparisons)
Psychological conditions, mean (SD)	0.557 (0.987)	1.286 (1.436)	1.667 (1.637)	0.001	<0.001	0.248
Physical conditions, mean (SD)	2.871 (2.035)	2.538 (2.362)	2.173 (1.948)	0.387	0.016	0.743
<b>Symptoms</b>						
Uses cannabis for a psychological symptom, n (%)	44 (54.3)	77 (80.2)	171 (92.9)	<0.001	<0.001	0.093
Uses cannabis for a physical symptom, n (%)	70 (86.4)	81 (84.4)	159 (86.4)	0.526	0.521	0.323
<b>Number of symptoms per participant, mean (SD)</b>	4.93 (5.2)	7.48 (6.11)	8.85 (6.22)	0.002	<0.001	0.051
Psychologic symptoms, mean (SD)	1.81 (3.19)	4.72 (4.97)	5.80 (4.86)	<0.001	0.001	0.051
Physical symptoms, mean (SD)	3.11 (2.88)	2.76 (2.55)	3.04 (2.82)	0.631 (no pairwise comparisons)	0.631 (no pairwise comparisons)	0.631 (no pairwise comparisons)

Tested using a Kruskal-Wallis test for ratio variable and post hoc pair wise tests Bonferroni at a p<0.05. The Chi<sup>2</sup> test was used for nominal variables, tested at a significance level of p<0.017.

**Table 12a: Survey participants' self-reported health**

	Participants N(%)			Exclusive medical vs previous recreational	Exclusive medical vs current recreational	Previous recreational vs current recreational
	Exclusive medical	Previous recreational	Current recreational			
	N=76	N=85	N=168	p	p	P
<b>Self-reported health</b>				1.000	<0.001	0.005
Excellent	2 (2.6)	0 (0)	13 (7.7)			
Very good	5 (6.6)	6 (7.1)	28 (16.7)			
Good	14 (18.4)	27 (31.8)	51 (30.4)			
Fair	33 (43.4)	30 (35.3)	49 (29.2)			
Poor	22 (28.9)	22 (25.9)	27 (16.1)			

Test: tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni at a significance level of  $p < 0.05$ .

**Table 13a: Survey participants' physical functioning and emotional well-being**

	Participants			Exclusive medical vs previous recreational	Exclusive medical vs current recreational	Previous recreational vs current recreational
	Exclusive medical	Previous recreational	Current recreational			
	N=69	N=80	N=163	p	p	P
<b>Physical functioning score, mean (SD)</b>	53.91 (29.8)	62.8 (27.5)	76.9 (26.0)	0.324	<0.001	<0.001
	N=75	N=85	N=172			
<b>Emotional well-being, mean (SD)</b>	65.76 (20.5)	60.89 (20.3)	62.91 (18.9)	0.310 (no pairwise comparisons)	0.310 (no pairwise comparisons)	0.310 (no pairwise comparisons)

Test: tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni at a significance level of  $p < 0.05$ .

### 1.4 Cannabis careers

**Table 15a: Survey participants' age of first use cannabis**

	Exclusive medical	Previous recreational	Current recreational	Exclusive medical vs previous recreational	Exclusive medical vs current recreational	Previous recreational vs current recreational
<b>Age first use cannabis, mean (SD)</b>	42.4 (14.2)	18.59 (6.3)	17.75 (6.8)	<0.001	<0.001	0.728
<b>Age first use cannabis for health purposes, mean (SD)</b>	43.63 (13.9)	30.47 (12.3)	27.19 (10.3)	<0.001	<0.001	0.163
<b>Age difference, mean (SD)</b>	1.618 (6.509)	11.065 (11.19)	9.411 (9.184)	<0.001	<0.001	1.00
<b>Number of years using cannabis, mean (SD)</b>	4.49 (7.631)	8.94 (7.766)	11.23 (9.260)	<0.001	<0.001	0.083

Test: tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni at a significance level of  $p < 0.05$ .



Appendix 1

**Table 16a: Survey participants' motives for initial use**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical N=81	Previous recreational N=96	Current recreational N=184	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	P
<b>Experienced the beneficial effects during recreational cannabis use</b>												
Not selected	71 (87.7)	37 (38.5)	39 (21.2)	11.322	5.194-24.679	<0.001	26.397	12.463-55.911	<0.001	2.332	1.356-4.010	0.002
Yes	10 (12.3)	59 (62.1)	145 (78.8)	1			1			1		
<b>Have heard/ read about it in the media</b>												
Not selected	37 (45.7)	53 (55.2)	115 (62.5)	0.682	0.377-1.236	0.206	0.505	0.297-0.857	0.011	0.740	0.448-1.220	0.237
Yes	44 (54.3)	43 (44.8)	69 (37.5)	1			1			1		
<b>Have read about it in a scientific article</b>												
Not selected	49 (60.5)	66 (68.8)	92 (50.0)	0.696	0.374-1.294	0.251	1.531	0.900-2.604	0.115	2.200	1.309-3.698	0.003
Yes	32 (39.5)	30 (31.3)	92 (50.0)	1			1			1		
<b>Nothing else relieved symptoms</b>												
Not selected	47 (58.0)	52 (54.2)	118 (64.1)	1.170	0.644-2.124	0.607	0.773	0.453-1.319	0.345	0.661	0.400-1.092	0.105
Yes	34 (42.0)	44 (45.8)	66 (35.9)	1			1			1		
<b>Suggested by other users/ patients</b>												
Not selected	63 (77.8)	75 (78.1)	139 (75.5)	0.980	0.480-2.000	0.956	1.133	0.608-2.111	0.694	1.156	0.641-2.084	0.629
Yes	18 (22.2)	21 (21.9)	45 (24.5)	1			1			1		
<b>Suggested by friends, family or acquaintances</b>												
Not selected	65 (80.2)	82 (85.4)	158 (85.9)	0.694	0.316-1.525	0.361	0.669	0.336-1.328	0.248	0.964	0.478-1.945	0.918
Yes	16 (19.8)	14 (14.6)	26 (14.1)	1			1			1		
<b>Suggested by a physician</b>												
Not selected	62 (76.5)	85 (88.5)	164 (89.1)	0.422	0.188-0.951	0.034	0.398	0.199-0.795	0.008	0.942	0.432-2.058	0.882
Yes	19 (23.5)	11 (11.5)	20 (10.9)	1			1			1		
<b>Suggested by another medical professional</b>												
Not selected	68 (84.0)	89 (92.7)	165 (89.7)	0.411	0.156-1.087	0.067	0.602	0.282-1.288	0.188	1.464	0.593-3.616	0.406
Yes	13 (16.0)	7 (7.3)	19 (10.3)	1			1			1		

Tested using Chi<sup>2</sup> test at a significance level of p<0.017.

## 2. Self-reported effects

### 2.1 Self-reported efficacy

**Table 20a: Survey participants' perceived symptom improvement (n>50)**

	No improvement	Minimal improvement	Moderate improvement	Much improvement	Complete improvement	I don't know
<b>All symptoms</b>	<b>63 (2.2)</b>	<b>202 (6.9)</b>	<b>558 (19.0)</b>	<b>1382 (47.2)</b>	<b>675 (23.0)</b>	<b>50 (1.7)</b>
Chronic pain (n=236)	2 (0.8)	14 (5.9)	41 (17.4)	143 (60.6)	35 (14.8)	1 (0.4)
Sleep problems (n=205)	3 (1.5)	9 (4.4)	23 (11.2)	97 (47.3)	71 (34.6)	2 (1.0)
Feeling depressed/ sadness (n=159)	5 (3.1)	8 (5.0)	35 (22.0)	78 (49.1)	30 (18.9)	3 (1.9)
Stress (n=150)	0 (0.0)	5 (3.3)	24 (16.0)	80 (53.3)	39 (26.0)	2 (1.3)
Nervousness (n=137)	0 (0.0)	5 (3.6)	20 (14.6)	74 (54.0)	37 (27.0)	1 (0.7)
Inflamations (n=128)	5 (3.9)	13 (10.2)	34 (26.6)	49 (38.3)	21 (16.4)	6 (4.7)
Restlessness (n=102)	0 (0.0)	2 (2.0)	20 (19.6)	48 (47.1)	30 (29.4)	2 (2.0)
Anxiety (n=92)	1 (1.1)	5 (5.4)	25 (27.2)	45 (48.9)	15 (16.3)	1 (1.1)
Acute pain (n=87)	0 (0.0)	3 (3.4)	18 (20.7)	45 (51.7)	21 (24.1)	0 (0.0)
Stiffness (n=86)	2 (2.3)	7 (8.1)	22 (25.6)	42 (48.8)	12 (14.0)	1 (1.2)
Spasms/ fasciculation (n=80)	0 (0.0)	2 (2.5)	13 (16.3)	44 (55.0)	20 (25.0)	1 (1.3)
Anger (n=75)	0 (0.0)	5 (6.7)	9 (12.0)	36 (48.0)	25 (33.3)	0 (0.0)
Hyperactivity/ excessive energy (n=64)	0 (0.0)	0 (0.0)	5 (7.8)	40 (62.5)	18 (28.1)	1 (1.6)
Fatigue/ low energy (n=63)	5 (7.9)	6 (9.5)	16 (25.4)	25 (39.7)	10 (15.9)	1 (1.6)
Mood swings (n=61)	0 (0.0)	4 (6.6)	14 (23.0)	29 (47.5)	13 (21.3)	1 (1.6)
Social anxiety (n=58)	1 (1.7)	5 (8.6)	12 (20.7)	27 (46.6)	12 (20.7)	1 (1.7)
Panic/ panic attacks (n=58)	2 (3.4)	5 (8.6)	7 (12.1)	29 (50.0)	14 (24.1)	1 (1.7)
Nightmares, night terror or night sweats (n=57)	1 (1.8)	4 (7.0)	8 (14.0)	24 (42.1)	20 (35.1)	0 (0.0)
Attention or concentration problems (n=57)	0 (0.0)	3 (5.3)	14 (24.6)	30 (52.6)	10 (17.5)	0 (0.0)
Decreased appetite (n=56)	1 (1.8)	3 (5.4)	7 (12.5)	25 (44.6)	19 (33.9)	1 (1.8)
Loneliness (n=55)	7 (12.7)	10 (18.2)	14 (25.5)	17 (30.9)	7 (12.7)	0 (0.0)

Appendix 1

**Table 21a: Influence of cannabis on survey participants' quality of life**

	Participants N (%)			Exclusive medical vs previous recreational	Exclusive medical vs current recreational	Previous recreational vs current recreational
	Exclusive medical	Previous recreational	Current recreational			
	N=80	N=93	N=181	P	P	p
<b>Self-reported quality of life</b>				0.169	0.084	1.000
My quality of life has been fully restored	2 (2.5)	1 (1.1)	14 (7.7)			
My quality of life has improved a lot	42 (52.5)	51 (54.8)	104 (57.5)			
My quality of life has improved somewhat	27 (33.8)	37 (39.8)	56 (30.9)			
My quality of life has not changed	8 (10.0)	3 (3.2)	5 (2.8)			
My quality of life has worsened somewhat	0 (0)	0 (0)	1 (0.6)			
My quality of life has worsened a lot	1 (1.3)	0 (0)	0 (0)			
My quality of life is worse than ever	0 (0)	1 (1.1)	1 (0.6)			

Test: tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni at a significance level of  $p < 0.05$ .

**2.2 Psychoactive effects**

**Table 22a: Survey participants' attitudes towards psychoactive effects caused by cannabis**

	Participants N (%)			Exclusive medical vs previous recreational	Exclusive medical vs current recreational	Previous recreational vs current recreational
	Exclusive medical	Previous recreational	Current recreational			
	N=81	N=96	N=184	P	P	P
<b>Cannabis' psychoactive effects have changed over time</b>				0.063	<0.001	0.130
Strongly disagree	26 (32.1)	14 (14.6)	19 (10.3)			
Disagree	9 (11.1)	16 (16.7)	24 (13.0)			
Neither agree nor disagree	28 (34.6)	31 (32.3)	46 (25.0)			
Agree	11 (13.6)	25 (26.0)	73 (39.7)			
Strongly agree	7 (8.6)	10 (10.4)	22 (12.0)			
<b>'The high' is of therapeutic value</b>				<0.001	<0.001	<0.001
Strongly disagree	28 (34.6)	4 (4.2)	4 (2.2)			
Disagree	15 (18.5)	5 (5.2)	4 (2.2)			
Neither agree nor disagree	23 (28.4)	25 (26.0)	16 (8.7)			
Agree	9 (11.1)	47 (49.0)	87 (47.3)			
Strongly agree	6 (7.4)	15 (15.6)	73 (39.7)			
<b>I use cannabis to become high</b>				<0.001	<0.001	<0.001
Strongly disagree	64 (79.0)	29 (30.2)	11 (6.0)			
Disagree	11 (13.6)	35 (36.5)	39 (21.2)			
Neither agree nor disagree	4 (4.9)	23 (24.0)	69 (37.5)			
Agree	0 (0.0)	6 (6.3)	54 (29.3)			
Strongly agree	2 (2.5)	3 (3.1)	11 (6.0)			

Test: tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni at a significance level of  $p < 0.05$ .

Appendix

**Table 23a: Survey participants’ experiences with the ‘high’**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical N=75	Previous recreational N=92	Current recreational N=182	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	P
<b>Ever high</b>												
No	38 (50.7)	3 (3.3)	3 (1.6)	30.468	8.849-104.904	<0.001	61.279	17.956-209.136	<0.001	2.011	0.398-10.167	0.389
Yes	37 (49.3)	89 (96.7)	179 (98.4)	1			1			1		

Tested using Chi<sup>2</sup> test at a significance level of p<0.017.

**Table 23b: Survey participants’ experiences with the ‘high’**

	Participants N(%)			Exclusive medical vs previous recreational	Exclusive medical vs current recreational	Previous recreational vs current recreational
	Exclusive medical N=40	Previous recreational N=89	Current recreational N=178	P	p	P
<b>High past 12 months</b>				0.046	<0.001	<0.001
Never	6 (15.0)	11 (12.4)	3 (1.7)			
Rarely	24 (60.0)	32 (36.0)	34 (19.1)			
Occasionally	1 (2.5)	10 (11.2)	22 (12.4)			
Frequently	7 (17.5)	19 (21.3)	55 (30.9)			
Always	2 (5.0)	17 (19.1)	64 (36.0)			
<b>Enjoys feeling high when using cannabis for health purposes</b>				0.106	<0.001	<0.001
Never	10 (23.8)	5 (5.6)	1 (0.6)			
Rarely	6 (14.3)	2 (2.2)	4 (2.2)			
Occasionally	5 (11.9)	27 (30.0)	26 (14.4)			
Frequently	6 (14.3)	23 (25.6)	63 (34.8)			
Always	7 (16.7)	19 (21.1)	76 (42.0)			
Does not experience a high when using cannabis for medicinal purposes*	8 (19.0)	14 (15.6)	11 (6.1)			

Tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni at a significance level of p<0.05.

\* The answer option: ‘does not experience a high when using cannabis for medicinal purposes’ is codes as a missing value for the Kruskal wallis analysis.

## 2.3 Side effects

**Table 25a: Attitudes towards and experiences with familiar adverse effects caused by cannabis**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical N=81	Previous recreational N=96	Current recreational N=184	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	P
<b>Drowsiness</b>												
Positive	36 (44.4)	67 (69.8)	120 (65.2)	4.581	2.140-9.809	<0.001	5.079	2.613-9.873	<0.001	1.109	0.522-2.355	0.788
Neutral	7 (8.6)	10 (10.4)	29 (15.8)	3.516	1.01-11.231	0.034	6.313	2.341-17.025	<0.001	1.795	0.662-4.868	0.250
Negative	6 (7.4)	6 (6.3)	14 (7.6)	2.462	0.669-9.053	0.175	3.556	1.179-10.718	0.024	1.444	0.444-4.702	0.541
Not applicable	32 (39.5)	13 (13.5)	21 (11.4)	1			1			1		
<b>Feeling high</b>												
Positive	17 (21.0)	46 (47.9)	145 (78.8)	7.216	3.319-15.686	<0.001	51.176	20.776-126.061	<0.001	7.092	2.894-17.382	<0.001
Neutral	6 (7.4)	23 (24.0)	23 (12.5)	10.222	3.580-29.187	<0.001	23.00	7.143-74.061	<0.001	2.250	0.816-6.201	0.117
Negative	10 (12.3)	9 (9.4)	8 (4.3)	2.400	0.839-6.865	0.103	4.800	1.455-15.834	0.010	2.000	0.564-7.087	0.283
Not applicable	48 (59.3)	18 (18.8)	8 (4.3)	1			1			1		
<b>Decreased appetite</b>												
Positive	9 (11.1)	8 (8.3)	19 (10.3)	0.835	0.303-2.301	0.727	1.201	0.512-2.816	0.674	1.438	0.596-3.470	0.419
Neutral	9 (11.1)	11 (11.5)	27 (14.7)	1.148	0.446-2.959	0.775	1.706	0.754-3.860	0.199	1.486	0.692-3.193	0.310
Negative	1 (1.2)	11 (11.5)	29 (15.8)	10.333	1.296-82.404	0.027	16.495	2.193-124.062	0.006	1.596	0.748-3.408	0.227
Not applicable	62 (76.5)	66 (68.6)	109 (59.2)	1			1			1		
<b>Increased appetite</b>												
Positive	20 (24.7)	43 (44.8)	95 (51.6)	4.031	1.951-8.330	<0.001	8.550	4.303-16.990	<0.001	2.121	1.090-4.128	0.027
Neutral	11 (13.6)	16 (16.7)	39 (21.2)	2.727	1.094-6800	0.031	6.382	2.786-14.617	<0.001	2.340	1.043-5.248	0.039
Negative	5 (6.2)	13 (13.5)	25 (13.6)	4.875	1.553-15.307	0.007	9.000	3.064-26.436	<0.001	1.846	0.771-4.422	0.169
Not applicable	45 (55.6)	24 (25.0)	25 (13.6)	1			1			1		
<b>Weakness</b>												
Positive	8 (9.9)	6 (6.3)	15 (8.2)	0.727	0.238-2.215	0.574	1.107	0.444-2.761	0.827	1.524	0.563-4.128	0.407
Neutral	9 (11.1)	11 (11.5)	32 (17.4)	1.184	0.459-3.054	0.727	2.099	0.940-4.688	0.070	1.773	0.836-3.762	0.136
Negative	2 (2.5)	15 (15.6)	32 (17.4)	7.266	1.595-33.093	0.010	9.448	2.188-40.789	0.003	1.300	0.654-2.586	0.454
Not applicable	62 (76.5)	64 (66.7)	105 (57.1)	1			1			1		
<b>Being confused/ forgetful</b>												
Positive	6 (7.4)	7 (7.3)	14 (7.6)	1.458	0.457-4.653	0.524	2.175	0.781-6.059	0.137	1.492	0.555-4.005	0.428
Neutral	9 (11.1)	17 (17.7)	40 (21.7)	2.361	0.960-5.807	0.061	4.143	1.841-9.323	0.001	1.755	0.881-3.494	0.110
Negative	11 (13.6)	28 (29.2)	71 (38.6)	3.182	1.427-7.097	0.005	6.017	2.889-12.532	<0.001	1.891	1.052-3.399	0.033
Not applicable	55 (67.9)	44 (45.8)	59 (32.1)	1			1			1		

## Appendix

<b>Dry mouth</b>												
Positive	15 (18.5)	16 (16.7)	20 (10.9)	1.293	0.557-3.000	0.550	1.368	0.613-3.049	0.444	1.058	0.473-2.364	0.891
Neutral	5 (6.2)	19 (19.8)	53 (28.8)	4.606	1.552-13.667	0.006	10.872	3.930-30.074	<0.001	2.360	1.172-4.752	0.016
Negative	21 (25.9)	28 (29.2)	72 (39.1)	1.616	0.779-3.353	0.197	3.516	1.824-6.779	<0.001	2.176	1.151-4.113	0.017
Not applicable	40 (49.4)	33 (34.4)	39 (21.2)	1			1			1		
<b>Blurred vision</b>												
Positive	6 (7.4)	4 (4.2)	6 (3.3)	0.646	0.174-2.400	0.514	0.500	0.155-1.615	0.247	0.775	0.211-2.846	0.700
Neutral	7 (8.6)	12 (12.5)	31 (16.8)	1.660	0.613-4.496	0.319	2.214	0.992-5.316	0.075	1.334	0.641-2.775	0.441
Negative	7 (8.6)	17 (17.7)	25 (13.6)	2.351	0.911-6.068	0.077	1.786	0.731-4.360	0.203	0.759	0.382-1.510	0.432
Not applicable	61 (75.3)	63 (65.6)	122 (66.3)	1			1			1		
<b>Dizziness</b>												
Positive	6 (7.4)	4 (4.2)	6 (3.3)	0.567	0.152-2.109	0.397	0.471	0.146-1.515	0.209	0.831	0.226-3.047	0.780
Neutral	8 (9.9)	12 (12.5)	29 (15.8)	1.276	0.488-3.339	0.619	1.708	0.735-3.970	0.214	1.338	0.641-2.793	0.438
Negative	10 (12.3)	13 (13.5)	28 (15.2)	1.106	0.451-2.712	0.826	1.319	0.600-2.900	0.491	1.193	0.579-2.456	0.633
Not applicable	57 (70.4)	67 (69.8)	121 (65.8)	1			1			1		
<b>Increased heartrate</b>												
Positive	3 (3.7)	5 (5.2)	12 (6.5)	1.698	0.386-7.465	0.483	2.204	0.596-8.153	0.236	1.298	0.434-3.882	0.641
Neutral	16 (19.8)	21 (21.9)	48 (26.1)	1.337	0.630-2.839	0.449	1.653	0.858-3.186	0.133	1.236	0.670-2.280	0.497
Negative	8 (9.9)	17 (17.7)	26 (14.1)	2.165	0.861-5.443	0.101	1.791	0.758-4.229	0.184	0.827	0.412-1.660	0.593
Not applicable	54 (66.7)	53 (55.2)	98 (53.3)	1			1			1		
<b>Fear, paranoia, hallucinations</b>												
Positive	5 (6.2)	4 (4.2)	11 (6.0)	0.837	0.215-3.254	0.797	1.216	0.406-3.646	0.727	1.453	0.445-4.744	0.536
Neutral	7 (8.6)	9 (9.4)	24 (13.0)	1.345	0.473-3.823	0.578	1.895	0.776-4.627	0.160	1.409	0.619-3.209	0.414
Negative	1 (1.2)	18 (18.8)	26 (14.1)	18.831	2.443-145.135	0.005	14.374	1.908-108.263	0.010	0.763	0.390-1.495	0.431
Not applicable	68 (84.0)	65 (67.7)	123 (68.8)	1			1			1		

Tested using Chi<sup>2</sup> test at a significance level of p<0.017.

### 3. Cannabis use patterns

#### 3.1 Frequency of use

**Table 28a: Survey participants' frequency of cannabis use during the past twelve months**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical N=78	Previous recreational N=94	Current recreational N=183	P			p			P		
<b>Frequency of use</b>				0.747 (no pairwise comparisons)			0.747 (no pairwise comparisons)			0.747 (no pairwise comparisons)		
Less than once a week	3 (3.8)	5 (5.3)	7 (3.8)									
1 to 2 days per week	5 (6.4)	5 (5.3)	12 (6.6)									
3 to 4 days per week	6 (7.7)	9 (9.6)	20 (10.9)									
5 to 6 days per week	5 (6.4)	7 (7.4)	15 (8.2)									
Daily	59 (75.6)	68 (72.3)	129 (70.5)									

Test: tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni at a significance level of  $p < 0.05$ .

**Table 30a: Survey participants' periods without using cannabis**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical N=80	Previous recreational N=96	Current recreational N=183	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	p
<b>Periods without using cannabis</b>												
Yes	36 (45.0)	76 (79.2)	140 (76.5)	0.215	0.111-0.417	<0.001	0.251	0.144-0.439	<0.001	1.167	0.641-2.126	0.613
No	44 (55.0)	20 (20.8)	43 (23.5)	1			1			1		

Tested using Chi<sup>2</sup> test at a significance level of  $p < 0.017$ .

#### 3.1 Dose

**Table 32a: Survey participants' cannabis dose**

	Exclusive medical	Previous recreational	Current recreational	Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
				p			p			p		
<b>Grams/week, mean (SD)</b>	3.835 (4.02)	5.459 (5.49)	5.461 (4.85)	0.121 (no pairwise comparisons)			0.121 (no pairwise comparisons)			0.121 (no pairwise comparisons)		
<b>Millilitres/week, mean (SD)</b>	6.16 (10.95)	1.910 (2.27)	3.493 (8.99)	0.028			0.109			1.000		

Test: tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni at a significance level of  $p < 0.05$ .

**Table 33a: Amounts of cannabis used by survey participants since start of their use**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical N=81	Previous recreational N=96	Current recreational N=184	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	P
<b>Stable</b>												
No	38 (46.9)	61 (63.5)	125 (67.9)	0.507	0.278-0.926	0.026	0.417	0.244-0.712	0.001	0.823	0.490-1.381	0.460
Yes	43 (53.1)	35 (36.5)	59 (32.1)									
<b>Varying</b>												
No	73 (90.1)	69 (71.9)	109 (59.2)	3.571	1.519-8.395	0.002	6.279	2.858-13792	<0.001	1.758	1.032-2.997	0.037
Yes	8 (9.9)	27 (28.1)	75 (40.8)									
<b>Up to down</b>												
No	74 (91.4)	87 (90.6)	165 (89.7)	1.094	0.388-3.079	0.865	1.217	0.491-3.021	0.671	1.113	0.483-2.564	0.801
Yes	7 (8.6)	9 (9.4)	19 (10.3)									
<b>Slowly more</b>												
No	71 (87.7)	90 (93.8)	170 (92.4)	0.473	0.164-1.365	0.159	0.585	0.248-1.378	0.216	1.235	0.459-3.324	0.675
Yes	10 (12.3)	6 (6.3)	14 (7.6)									
<b>Slowly less</b>												
No	76 (93.8)	85 (88.5)	173 (94.0)	1.967	0.654-5.918	0.222	0.966	0.325-2.877	0.951	0.491	0.205-1.179	0.106
Yes	5 (6.2)	11 (11.5)	11 (6.0)									
<b>Intermittent</b>												
No	80 (98.8)	90 (93.8)	179 (97.3)	5.3333	0.629-45.254	0.088	2.235	0.257-19.438	0.455	0.419	0.125-1.410	0.149
Yes	1 (1.2)	6 (6.3)	5 (2.7)									

Tested using Chi<sup>2</sup> test at a significance level of p<0.017.

### 3.1 Cannabis products and administration methods

**Table 34a: cannabis products used by survey participants in the past twelve months**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical N=81	Previous recreational N=96	Current recreational N=184	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	P
<b>Dried female flowers</b>												
No	41 (50.6)	10 (10.4)	4 (2.2)	8.815	4.015-19.355	<0.001	46.15	15.627-136.140	<0.001	5.233	1.596-17.160	0.003
Yes	40 (49.4)	86 (89.6)	180 (97.8)	1			1			1		
<b>Hash</b>												
No	70 (86.4)	40 (41.7)	30 (16.3)	8.909	4.191-18.939	<0.001	32.667	15.486-68.906	<0.001	3.667	2.087-6.442	<0.001
Yes	11 (13.6)	56 (58.3)	154 (83.7)	1			1			1		



Appendix 1

<b>Cannabis oil</b>												
No	37 (45.7)	49 (51.0)	91 (49.5)	0.807	0.446-1.459	0.477	0.859	0.509-1.451	0.571	1.065	0.650-1.745	0.801
Yes	44 (54.3)	47 (49.0)	93 (50.5)	1			1			1		
<b>CBD oil</b>												
No	25 (30.9)	40 (41.7)	84 (45.7)	0.625	0.336-1.164	0.137	0.531	0.306-0.924	0.024	0.850	0.516-1.400	0.524
Yes	56 (69.1)	56 (58.3)	100 (54.3)	1			1			1		
<b>Sativex</b>												
No	76 (93.8)	91 (94.8)	177 (96.2)	0.835	0.233-2.993	0.782	0.601	0.185-1.954	0.393	0.720	0.222-2.331	0.582
Yes	5 (6.2)	5 (5.2)	7 (3.8)	1			1			1		
<b>Raw cannabis juice</b>												
No	78 (96.3)	89 (92.7)	151 (82.1)	2.045	0.511-8.179	0.303	5.682	1.689-19.114	0.002	2.779	1.180-6.544	0.016
Yes	3 (3.7)	7 (7.3)	33 (17.9)	1			1			1		
<b>Ointment, balm or lotion</b>												
No	58 (71.6)	74 (77.1)	58 (71.6)	0.750	0.381-1.477	0.404	1.282	0.724-2.270	0.394	1.709	0.971-3.010	0.062
Yes	23 (28.4)	22 (22.9)	23 (28.4)	1			1			1		

Tested using Chi<sup>2</sup> test at a significance level of p<0.017.

**Table 35a: administration methods used by survey participants in the past twelve months**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical N=81	Previous recreational N=96	Current recreational N=184	OR	CI 95%	P	OR	CI 95%	p	OR	CI 95%	P
<b>Smoked with a joint</b>												
No	53 (65.4)	20 (20.8)	14 (7.6)	7.193	3.671-14.092	<0.001	22.985	11.280-46.835	<0.001	3.195	1.533-6.661	0.001
Yes	28 (34.6)	76 (79.2)	170 (92.4)	1			1			1		
<b>Inhaled with a vaporizer</b>												
No	56 (69.1)	43 (44.8)	42 (22.8)	2.761	1.486-5.131	0.001	7.573	4.224-13.577	<0.001	2.743	1.615-4.658	<0.001
Yes	25 (30.9)	53 (55.2)	142 (77.2)	1			1			1		
<b>Smoked with a hookah</b>												
No	74 (91.4)	53 (55.2)	83 (45.1)	8.577	3.582-20.538	<0.001	12.864	5.623-29.432	<0.001	1.500	0.913-2.463	0.108
Yes	7 (8.6)	43 (44.8)	101 (54.9)	1			1			1		
<b>Smoked with a blunt</b>												
No	76 (93.8)	69 (71.9)	117 (63.6)	5.948	2.170-16.304	<0.001	8.704	3.355-22.584	<0.001	1.463	0.856-2.503	0.163
Yes	5 (6.2)	27 (28.1)	67 (36.4)	1			1			1		
<b>Eaten in edibles</b>												
No	66 (81.5)	43 (44.8)	44 (23.9)	5.423	2.720-10.813	<0.001	14.00	7.272-26.952	<0.001	2.581	1.526-4.368	<0.001
Yes	15 (18.5)	53 (55.2)	140 (76.1)	1			1			1		
<b>Drank as tea or another drink</b>												
No	67 (82.7)	58 (60.4)	92 (50.0)	3.135	1.547-6.355	0.001	4.786	2.512-9.116	<0.001	1.526	0.925-2.519	0.097
Yes	14 (17.3)	38 (39.6)	92 (50.0)	1			1			1		

Appendix

<b>Chewing, eating or drinking raw cannabis flowers or leaves</b>												
No	75 (92.6)	80 (83.3)	138 (75.0)	2.500	0.929-6.726	0.063	4.167	1.701-10.207	0.001	1.667	0.886-3.136	0.111
Yes	6 (7.4)	16 (16.7)	46 (25.0)	1			1			1		
<b>Oral ingestion through drops</b>												
No	16 (19.8)	40 (41.7)	92 (50.0)	0.345	0.174-0.681	0.002	0.246	0.133-0.457	<0.001	0.714	0.434-1.175	0.185
Yes	65 (80.2)	56 (58.3)	92 (50.0)	1			1			1		
<b>Oral ingestion through capsules</b>												
No	73 (90.1)	88 (91.7)	165 (89.7)	0.830	0.297-2.319	0.721	1.051	0.440-2.510	0.911	1.267	0.533-3.010	0.592
Yes	8 (9.9)	8 (8.3)	19 (10.3)	1			1			1		
<b>Oral ingestion through a spray</b>												
No	74 (91.4)	91 (94.8)	176 (95.7)	0.581	0.177-1.905	0.365	0.481	0.168-1.373	0.163	0.827	0.263-2.601	0.745
Yes	7 (8.6)	5 (5.2)	8 (4.3)	1			1			1		
<b>Cutaneous use</b>												
No	56 (69.1)	79 (82.3)	148 (80.4)	0.482	0.238-0.975	0.040	0.545	0.300-0.989	0.044	1.130	0.597-2.140	0.707
Yes	25 (30.9)	17 (17.7)	36 (19.6)	1			1			1		

Tested using Chi<sup>2</sup> test at a significance level of p<0.017.

**Table 35b: number of cannabis products and administration methods**

	Exclusive medical	Previous recreational	Current recreational	Exclusive medical vs previous recreational	Exclusive medical vs current recreational	Previous recreational vs current recreational
				p	p	p
<b>Number of cannabis products, mean (SD)</b>	2.25 (1.09)	2.91 (1.34)	3.42 (1.44)	0.005	<0.001	0.022
<b>Number of administration methods, mean (SD)</b>	2.53 (1.58)	4.08 (2.29)	4.96 (2.13)	<0.001	<0.001	0.003

Test: tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni at a significance level of p<0.05.

**Table 36a: Cannabis mixed with tobacco by survey participants who inhale cannabis**

	Participants N(%)			Exclusive medical vs previous recreational	Exclusive medical vs current recreational	Previous recreational vs current recreational
	Exclusive medical	Previous recreational	Current recreational			
	N=38	N=84	N=182	p	p	p
<b>Tobacco use</b>				0.058	0.002	0.852
Never	16 (42.1)	19 (22.6)	35 (19.2)			
Seldom- sometimes	7 (18.4)	15 (17.9)	25 (13.7)			
Often- always	15 (39.5)	50 (59.5)	122 (67.0)			

Test: tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni at a significance level of p<0.05.

## 4. Cannabis use motives

### 4.1 Recreational cannabis use

**Table 39a: Survey participants' attitudes towards recreational cannabis use**

	Participants N(%)			Exclusive medical vs previous recreational	Exclusive medical vs current recreational	Previous recreational vs current recreational
	Exclusive medical	Previous recreational	Current recreational	P	P	P
<b>Recreational cannabis use can be therapeutically valuable</b>				<0.001	<0.001	<0.001
Strongly disagree	15 (22.1)	1 (1.1)	3 (1.7)			
Disagree	11 (16.2)	9 (10.1)	2 (1.1)			
Neither agree nor disagree	16 (23.5)	17 (19.1)	13 (7.3)			
Agree	21 (30.9)	45 (50.6)	81 (45.8)			
Strongly agree	5 (7.4)	17 (19.1)	78 (44.1)			
<b>Recreational cannabis use can sometimes be considered as medical</b>				<0.001	<0.001	0.190
Strongly disagree	15 (22.4)	4 (4.7)	2 (1.1)			
Disagree	8 (11.9)	15 (17.4)	4 (2.3)			
Neither agree nor disagree	10 (14.9)	17 (19.8)	22 (12.5)			
Agree	28 (41.8)	34 (39.5)	81 (46.0)			
Strongly agree	6 (9.0)	16 (18.6)	67 (38.1)			
<b>Recreational and medicinal cannabis use are difficult to distinguish</b>				0.081	<0.001	0.031
Strongly disagree	24 (33.3)	18 (20.5)	13 (7.5)			
Disagree	19 (26.4)	18 (20.5)	41 (23.6)			
Neither agree nor disagree	11 (15.3)	20 (22.7)	30 (17.2)			
Agree	12 (16.7)	21 (23.9)	57 (32.8)			
Strongly agree	6 (8.3)	11 (12.5)	33 (19.0)			
<b>I am an opponent of recreational cannabis use</b>				<0.001	<0.001	0.037
Strongly disagree	13 (17.8)	42 (42.6)	120 (68.2)			
Disagree	21 (28.8)	32 (35.2)	31 (17.6)			
Neither agree nor disagree	23 (31.5)	14 (15.4)	10 (5.7)			
Agree	9 (12.3)	2 (2.2)	8 (4.5)			
Strongly agree	7 (9.6)	1 (1.1)	7 (4.0)			

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<b>When using cannabis would become legal I would (still) use it recreationally</b>				<0.001	<0.001	<0.001
Strongly disagree	32 (43.2)	16 (19.0)	0 (0.0)			
Disagree	24 (32.4)	10 (11.9)	4 (2.3)			
Neither agree nor disagree	13 (17.6)	20 (23.8)	16 (9.3)			
Agree	3 (4.1)	27 (32.1)	53 (30.8)			
Strongly agree	2 (2.7)	11 (13.1)	99 (57.6)			
<b>When I would be freed from my complaints and conditions, I would definitely stop using cannabis.</b>				0.001	<0.001	<0.001
Strongly disagree	6 (7.9)	12 (15.4)	54 (33.5)			
Disagree	14 (18.4)	25 (32.1)	71 (44.1)			
Neither agree nor disagree	6 (7.9)	16 (20.5)	25 (15.5)			
Agree	18 (23.7)	14 (17.9)	9 (5.6)			
Strongly agree	32 (42.1)	11 (14.1)	2 (1.2)			
<b>Recreational cannabis use impairs health</b>				0.017	<0.001	0.182
Strongly disagree	10 (15.2)	23 (26.7)	63 (37.3)			
Disagree	15 (22.7)	28 (32.6)	55 (32.5)			
Neither agree nor disagree	28 (42.4)	28 (32.6)	42 (24.9)			
Agree	7 (10.6)	6 (7.0)	6 (3.6)			
Strongly agree	6 (9.1)	1 (1.2)	3 (1.8)			

Test: tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni at a significance level of p<0.05.

**Table 40a: Number of people where survey participants spend their free time with that use cannabis recreationally**

	Participants N(%)			Exclusive medical vs previous recreational	Exclusive medical vs current recreational	Previous recreational vs current recreational
	Exclusive medical	Previous recreational	Current Recreational			
	N=69	N=83	N=162	P	p	P
<b>Number of people where you spend free time with that use cannabis recreationally</b>				<0.001	<0.001	0.002
Nobody	23 (33.3)	3 (3.6)	2 (1.2)			
Almost nobody	26 (37.7)	16 (19.3)	15 (9.3)			
The minority	16 (23.2)	34 (41.0)	45 (27.8)			
About half	1 (1.4)	14 (16.9)	49 (30.2)			
The majority	3 (4.3)	12 (14.5)	32 (19.8)			
Almost everybody	0 (0.0)	4 (4.8)	17 (10.5)			
Everybody	0 (0.0)	0 (0.0)	2 (1.2)			

Test: tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni at a significance level of p<0.05.

### 4.2 Motives for cannabis use

**Table 41a: Survey participants who have used cannabis use for the following purposes during the past 12 months**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical N=81	Previous recreational N=96	Current recreational N=184	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	P
<b>Because you were under the influence of alcohol</b>												
No	78 (96.3)	86 (89.6)	142 (77.2)	3.023	0.803-11.39	0.088	7.690	2.308-25.620	<0.001	2.544	1.214-5.330	0.011
Yes	3 (3.7)	10 (10.4)	42 (22.8)	1			1			1		
<b>To relieve boredom</b>												
No	78 (96.3)	64 (66.7)	76 (41.3)	13.00	3.805-44.420	<0.001	36.947	11.241-121.436	<0.001	2.842	1.697-4.761	<0.001
Yes	3 (3.7)	32 (33.3)	108 (58.7)	1			1			1		
<b>Because it was a special occasion</b>												
No	78 (97.5)	62 (65.3)	62 (33.7)	20.690	4.780-89.555	<0.001	77.726	18.485-326.828	<0.001	3.757	2.232-6.321	<0.001
Yes	2 (2.5)	33 (34.7)	122 (66.3)	1			1			1		
<b>Because it is fun</b>												
No	76 (93.8)	37 (38.5)	17 (9.2)	24.238	8.971-65.482	<0.001	149.318	53.129-419.651	<0.001	6.161	3.227-11.759	<0.001
Yes	5 (6.2)	59 (61.5)	167 (90.8)	1			1			1		
<b>To allow you to think differently</b>												
No	68 (84.0)	32 (33.3)	23 (12.6)	10.462	5.044-21.696	<0.001	36.615	17.526-76.498	<0.001	3.500	1.904-6.435	<0.001
Yes	13 (16.0)	64 (66.7)	161 (87.5)				1			1		
<b>To forget your problems</b>												
No	71 (87.7)	49 (51.0)	72 (39.1)	6.810	3.142-14.761	<0.001	11.044	5.348-22.808	<0.001	1.622	0.986-2.668	0.056
Yes	10 (12.5)	47 (49.0)	112 (60.9)	1			1			1		
<b>To enjoy the effects of it</b>												
No	63 (77.8)	22 (22.9)	8 (4.3)	11.773	5.801-23.892	<0.001	77.000	31.902-185.850	<0.001	6.541	2.786-15.357	<0.001
Yes	18 (22.2)	74 (77.1)	176 (95.7)	1			1			1		
<b>To help you sleep</b>												
No	24 (29.6)	13 (13.5)	9 (4.9)	2.688	1.264-5.717	0.009	8.187	3.597-18.632	<0.001	3.046	1.252-7.410	0.011
Yes	57 (70.4)	83 (86.5)	175 (95.1)	1			1			1		
<b>To make you feel more confident</b>												

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No	74 (91.4)	67 (69.8)	95 (51.6)	4.576	1.881-11.132	<0.001	9.904	4.331-22.649	<0.001	2.164	1.283-3.651	0.003
Yes	7 (8.6)	29 (30.2)	89 (48.4)	1			1			1		
<b>To control symptoms</b>												
No	6 (7.4)	3 (3.1)	4 (2.2)	2.480	0.600-10.249	0.196	3.600	0.988-13.124	0.039	1.452	0.318-6.622	0.628
Yes	75 (92.6)	93 (96.9)	180 (97.8)	1			1			1		
<b>To divert the attention from my complaints</b>												
No	58 (71.6)	26 (27.1)	27 (14.7)	6.789	3.508-13.139	<0.001	14.663	7.791-27.600	<0.001	2.160	1.176-3.966	0.012
Yes	23 (28.4)	70 (72.9)	157 (85.3)	1			1			1		
<b>Physical relaxation</b>												
No	33 (40.7)	7 (7.3)	3 (1.6)	8.741	3.597-21.241	<0.001	41.479	12.197-141.059	<0.001	4.745	1.198-18.789	0.015
Yes	48 (59.3)	89 (92.7)	181 (98.4)	1			1			1		
<b>Mental relaxation</b>												
No	41 (50.6)	14 (14.6)	5 (2.7)	6.004	2.937-12.270	<0.001	36.695	13.639-98.724	<0.001	6.112	2.130-17.537	<0.001
Yes	40 (49.4)	82 (85.4)	179 (97.3)	1			1			1		
<b>To get high</b>												
No	71 (87.7)	42 (4.3.8)	16 (8.7)	9.129	4.205-19.817	<0.001	74.550	32.268-172.234	<0.001	8.167	4.253-15.680	<0.001
Yes	10 (12.3)	54 (56.3)	168 (91.3)	1			1			1		
<b>To get peace of mind</b>												
No	48 (59.3)	22 (22.9)	14 (7.6)	4.893	2.553-9.375	<0.001	17.662	8.749-35.655	<0.001	3.610	1.751-7.443	<0.001
Yes	33 (40.7)	74 (77.1)	170 (92.4)	1			1			1		
<b>To be able to take medicines</b>												
No	74 (91.4)	82 (85.4)	152 (82.6)	1.805	0.691-4.715	0.223	2.226	0.938-5.279	0.064	1.233	0.623-2.441	0.547
Yes	7 (8.6)	14 (14.6)	32 (17.4)	1			1			1		
<b>To get more energy</b>												
No	60 (74.1)	50 (52.1)	67 (36.4)	2.629	1.389-4.976	0.003	4.989	2.792-8.917	<0.001	1.898	1.151-3.131	0.012
Yes	21 (25.9)	46 (47.9)	117 (63.6)	1			1			1		
<b>To improve your focus</b>												
No	63 (77.8)	49 (51.0)	54 (29.3)	3.357	1.737-6.490	<0.001	8.426	4.567-15.545	<0.001	2.510	1.506-4.183	<0.001
Yes	18 (22.2)	47 (49.0)	130 (70.7)	1			1			1		
<b>To enjoy leisure activities</b>												
No	59 (72.8)	34 (35.4)	18 (9.8)	4.890	2.569-9.311	<0.001	24.732	12.404-49.316	<0.001	5.057	2.663-9.605	<0.001
Yes	22 (27.2)	62 (64.6)	166 (90.2)	1			1			1		
<b>It is nice to do with friends</b>												

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No	77 (95.1)	45 (46.9)	30 (16.3)	21.817	7.393-64.378	<0.001	98.817	33.607-290.559	<0.001	4.529	2.587-7.930	<0.001
Yes	4 (4.9)	51 (53.1)	154 (83.7)	1			1			1		
<b>To let off steam</b>												
No	74 (91.4)	35 (36.5)	34 (18.5)	18.424	7.646-44.395	<0.001	46.639	19.739-110.194	<0.001	2.531	1.449-4.423	0.001
Yes	7 (8.6)	61 (63.5)	150 (81.5)	1			1			1		
<b>To soften the effects of other psychoactive substances</b>												
No	78 (97.5)	88 (91.7)	135 (73.4)	3.591	0.740-17.416	0.092	14.337	3.394-60.567	<0.001	3.993	1.804-8.834	<0.001
Yes	2 (2.5)	8 (8.3)	49 (26.6)	1			1			1		
<b>To counteract other medicines' side effects</b>												
No	71 (87.7)	80 (83.3)	140 (76.1)	1.420	0.606-3.330	0.418	2.231	1.061-4.694	0.031	1.571	0.833-2.964	0.161
Yes	10 (12.3)	16 (16.7)	44 (23.9)	1			1			1		
<b>To get more inspiration</b>												
No	74 (91.4)	55 (57.3)	51 (27.7)	7.881	3.288-18.889	<0.001	27.569	11.907-63.832	<0.001	3.498	2.085-5.869	<0.001
Yes	7 (8.6)	41 (42.7)	133 (72.3)	1			1			1		

Tested using Chi<sup>2</sup> test at a significance level of p<0.017.

## 5. Conventional and alternative health care

### 5.1 Conventional medicines

**Table 42a: Survey participants' use of conventional medicines**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical	Previous recreational	Current recreational	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	P
<b>Regular use of conventional medicines</b>	<b>N=75</b>	<b>N=85</b>	<b>N=171</b>									
Yes	45 (60.0)	48 (56.5)	75 (43.9)	1.156	0.616-2.172	0.652	1.920	1.106-3.334	0.020	1.661	0.983-2.806	0.057
No	30 (40.0)	37 (43.5)	96 (56.1)	1			1			1		
<b>Use of medicines for the same purposes as cannabis</b>	<b>N=44</b>	<b>N=46</b>	<b>N=73</b>									
Yes	33 (75.0)	36 (78.3)	55 (75.3)	0.833	0.313-2.216	0.715	0.982	0.413-2.333	0.967	1.178	0.489-2.840	0.715
No	11 (25.0)	10 (21.7)	18 (24.7)	1			1			1		

Tested using Chi<sup>2</sup> test at a significance level of p<0.017.

**Table 43a: Survey participants' motives for using conventional medicines for the same purposes as cannabis**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical	Previous recreational	Current recreational	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	P
<b>Instructions of a physician</b>	<b>N=33</b>	<b>N=36</b>	<b>N=55</b>									
No	10 (30.3)	15 (41.7)	21 (38.2)	0.609	0.225-1.646	0.327	0.704	0.280-1.767	0.454	1.156	0.491-2.725	0.740
Yes	23 (69.7)	21 (58.3)	34 (61.8)	1			1			1		
<b>Medicines are legal</b>												
No	17 (51.5)	9 (25.0)	24 (43.6)	3.188	1.152-8.817	0.023	1.372	0.577-3.263	0.473	0.431	0.171-1.084	0.071
Yes	16 (48.5)	27 (75.0)	31 (56.4)	1			1			1		
<b>More accessible</b>												
No	23 (69.7)	17 (47.2)	34 (61.8)	2.571	0.956-6.915	0.0599	1.421	0.566-3.566	0.454	0.553	0.236-1.294	0.170
Yes	10 (30.3)	19 (52.8)	21 (38.2)	1			1			1		
<b>Cannabis alone is not sufficient for my complaints</b>												
No	22 (66.7)	20 (55.6)	33 (60.0)	1.600	0.602-4.254	0.345	1.333	0.541-3.288	0.532	0.833	0.356-1.950	0.674
Yes	11 (33.3)	16 (44.4)	22 (40.0)	1			1			1		
<b>Cheaper than cannabis</b>												
No	26 (78.8)	19 (52.8)	32 (58.2)	3.323	1.151-9.597	0.023	2.670	0.990-7.197	0.048	0.803	0.345-1.871	0.612
Yes	7 (21.2)	17 (47.2)	23 (41.8)	1			1			1		



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<b>Medicines are socially accepted</b>													
No	27 (81.8)	22 (61.6)	36 (65.5)	2.864	0.944-8.687	0.058	2.375	0.836-6.751	0.099	0.829	0.347-1.981	0.673	
Yes	6 (18.2)	14 (38.9)	19 (34.5)	1			1			1			
<b>Medicines and cannabis strengthen each other's effects</b>													
No	28 (84.8)	30 (83.3)	39 (70.9)	1.120	0.307-4.084	0.864	2.297	0.753-7.009	0.137	2.051	0.716-5.874	0.176	
Yes	5 (15.2)	6 (16.7)	16 (29.1)	1			1			1			
<b>Easier to use than cannabis</b>													
No	31 (93.9)	33 (91.7)	48 (87.3)	1.409	0.220-9.008	0.716	2.260	0.441-11.596	0.318	1.604	0.386-6.658	0.512	
Yes	2 (6.1)	3 (8.3)	7 (12.7)	1			1			1			
<b>Out of habit</b>													
No	32 (97.0)	34 (94.4)	49 (89.1)	1.882	0.163-21.781	0.607	3.918	0.450-34.091	0.186	2.082	0.396-10.93	0.378	
Yes	1 (3.0)	2 (5.6)	6 (10.9)	1			1			1			

Tested using Chi<sup>2</sup> test at a significance level of p<0.017.

**Table 44a: Survey participants' perceived efficacy and adverse effects of conventional medicines and cannabis**

	Participants N(%)			Exclusive medical vs previous recreational	Exclusive medical vs current recreational	Previous recreational vs current recreational
	Exclusive medical	Previous recreational	Current recreational			
<b>Medicines' effectivity compared to cannabis' effectivity</b>	<b>N=63</b>	<b>N=73</b>	<b>N=149</b>	0.513 (no pairwise comparisons)	0.513 (no pairwise comparisons)	0.513 (no pairwise comparisons)
Medicines are a lot more effective than cannabis	2 (3.2)	1 (1.4)	3 (2.0)			
Medicines are somewhat more effective than cannabis	3 (4.8)	2 (2.7)	3 (2.0)			
Medicines and cannabis are equally effective	7 (11.1)	5 (6.8)	10 (6.7)			
Cannabis is somewhat more effective than medicines	9 (14.3)	6 (8.2)	22 (14.8)			
Cannabis is a lot more effective than medicines	24 (38.1)	40 (54.8)	80 (53.7)			
Only cannabis is effective	18 (28.6)	19 (26.0)	31 (20.8)			
<b>Medicines' adverse effects compared to cannabis' adverse effects</b>	<b>N=59</b>	<b>N=72</b>	<b>N=143</b>	0.547 (no pairwise comparisons)	0.547 (no pairwise comparisons)	0.547 (no pairwise comparisons)
Cannabis' adverse effects are a lot worse than those of medicines	0 (0.0)	1 (1.4)	0 (0.0)			
Cannabis' adverse effects are somewhat worse than those of medicines	1 (1.7)	2 (2.8)	0 (0.0)			
The adverse effects are about the same	4 (6.8)	1 (1.4)	4 (2.8)			
Medicines' adverse effects are somewhat worse than those of cannabis	4 (6.8)	7 (9.7)	12 (8.4)			
Medicines' adverse effects are a lot worse than those of cannabis	50 (84.7)	61 (84.7)	127 (88.8)			

Test: tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni at a significance level of p<0.05

5.2 (The lack of) medical supervision

Table 45a: General practitioner informed about survey participants' cannabis use

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical	Previous recreational	Current recreational	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	P
<b>General practitioner</b>	<b>N=76</b>	<b>N=88</b>	<b>N=172</b>									
Yes	74 (97.4)	82 (93.2)	155 (90.1)	2.707	0.530-13.830	0.215	4.058	0.914-18.026	0.048	1.499	0.569-3.948	0.410
No	2 (2.6)	6 (6.8)	17 (9.9)	1			1			1		
<b>General practitioner informed</b>	<b>N=74</b>	<b>N=75</b>	<b>N=137</b>									
Yes	46 (62.2)	53 (70.7)	105 (76.6)	0.682	0.344-1.351	0.272	0.501	0.271-0.925	0.026	0.7344	0.389-1.386	0.340
No	28 (37.8)	22 (29.3)	32 (23.4)	1			1			1		

Tested using Chi<sup>2</sup> test at a significance level of p<0.017.

**Table 50a: Medical support and supervision**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical N=46	Previous recreational N=53	Current recreational N=105	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	P
<b>My GP is understanding</b>												
Disagree/ neutral	7 (15.2)	16 (30.2)	37 (35.2)	0.415	0.153-1.123	0.079	0.330	0.134-0.810	0.013	0.795	0.391-1.617	0.526
Agree	39 (84.8)	37 (69.8)	68 (64.8)	1			1			1		
<b>My GP disapproves of my cannabis use</b>												
Disagree/ neutral	44 (95.7)	49 (92.5)	91 (86.7)	1.796	0.313-10.288	0.506	3.385	0.737-15.548	0.099	1.885	0.588-6.037	0.280
Agree	2 (4.3)	4 (7.5)	14 (13.3)	1			1			1		
<b>Informing my GP jeopardised our relationship</b>												
Disagree/ neutral	45 (97.8)	53 (100.0)	99 (94.3)	0.459	0.370-0.569	0.281	2.727	0.319-23.323	0.341	0.651	0.580-0.732	0.076
Agree	1 (2.2)	0 (0.0)	6 (5.7)	1			1			1		
<b>My GP believes in the therapeutic potential of cannabis</b>												
Disagree/ neutral	19 (41.3)	26 (49.1)	68 (64.8)	0.731	0.329-1.621	0.440	0.383	0.188-0.779	0.007	0.524	0.268-1.025	0.058
Agree	27 (58.7)	27 (50.9)	37 (35.2)	1			1			1		
<b>Initially, my GP advised me to use cannabis</b>												
Disagree/ neutral	42 (91.3)	50 (94.3)	98 (93.3)	0.630	0.133-2.975	0.557	0.750	0.208-2.699	0.659	1.190	0.295-4.802	0.806
Agree	4 (8.7)	3 (5.7)	7 (6.7)	1			1			1		
<b>I receive medical instructions from a physician regarding my use</b>	<b>N=76</b>	<b>N=86</b>	<b>N=172</b>									
Disagree/ neutral	57 (75.0)	79 (91.9)	158 (91.9)	0.266	0.105-0.674	0.004	0.266	0.125-0.565	<0.001	1.000	0.388-2.577	1.000
Agree	19 (25.0)	7 (8.1)	14 (8.1)	1			1			1		
<b>I am properly supervised by a physician regarding my use</b>												
Disagree/ neutral	57 (75.0)	80 (93.0)	160 (93.0)	0.225	0.085-0.599	0.002	0.225	0.103-0.493	<0.001	1.000	0.362-2.762	1.000
Agree	19 (25.0)	6 (7.0)	12 (7.0)	1			1			1		

Tested using Chi<sup>2</sup> test at a significance level of p<0.017.

## 6. Social acceptance and stigma

**Table 53a: Concealing cannabis use from others**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical	Previous recreational	Current recreational	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	P
<b>Partner</b>												
Yes	7 (9.9)	8 (11.1)	17 (12.0)	0.875	0.300-2.556	0.807	0.804	0.317-2.039	0.646	0.919	0.376-2.244	0.853
No	64 (90.1)	64 (88.9)	125 (88.0)	1			1			1		
<b>Children</b>												
Yes (at least one)	13 (22.4)	18 (35.3)	39 (42.9)	0.530	0.228-1.231	0.137	0.385	0.183-0.810	0.011	0.727	0.358-1.477	0.378
No	45 (77.6)	33 (64.7)	52 (57.1)	1			1			1		
<b>Parents</b>												
Yes (at least one)	20 (32.8)	18 (22.5)	44 (27.7)	1.680	0.794-3.554	0.173	1.275	0.674-2.412	0.455	0.759	0.404-1.424	0.389
No	41 (67.2)	62 (77.5)	115 (72.3)	1			1			1		
<b>Family</b>												
Yes (at least one)	23 (32.4)	38 (45.2)	74 (43.5)	0.580	0.301-1.119	0.103	0.622	0.347-1.113	0.108	1.072	0.633-1.813	0.796
No	48 (67.6)	46 (54.8)	96 (56.5)	1			1			1		
<b>Employer</b>												
Yes (at least one)	31 (66.0)	39 (72.2)	87 (68.5)	0.745	0.319-1.739	0.496	0.891	0.438-1.812	0.750	1.195	0.592-2.415	0.619
No	16 (34.0)	15 (27.8)	40 (31.5)	1			1			1		
<b>Colleagues</b>												
Yes (at least one)	33 (64.7)	41 (68.3)	93 (66.0)	0.850	0.385-1.874	0.686	0.946	0.483-1.852	0.872	1.114	0.584-2.125	0.744
No	18 (35.3)	19 (31.7)	48 (34.0)	1			1			1		
<b>Friends</b>												
Yes (at least one)	33 (42.3)	33 (37.1)	61 (34.7)	1.244	0.668-2.318	0.490	1.383	0.801-2.387	0.244	1.111	0.654-1.888	0.697
No	45 (57.7)	56 (62.9)	115 (65.3)	1			1			1		
<b>Strangers</b>												
Yes (at least one)	50 (70.4)	58 (72.5)	123 (72.8)	0.903	0.445-1.832	0.778	0.890	0.483-1.642	0.710	0.986	0.543-1.790	0.963
No	21 (29.6)	22 (27.5)	46 (27.2)	1			1			1		

Tested using Chi<sup>2</sup> test at a significance level of p<0.017.

**Table 52a: Survey participants’ reasons for concealing their cannabis use**

	Participants N(%)			Exclusive medical vs previous recreational			Exclusive medical vs current recreational			Previous recreational vs current recreational		
	Exclusive medical N=61	Previous recreational N=68	Current recreational N=147	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	P
<b>Avoiding judgement</b>												
No	30 (49.2)	22 (32.4)	49 (33.3)	2.023	0.991-4.133	0.052	1.935	1.054-3.555	0.032	0.957	0.518-1.766	0.887
Yes	31 (50.8)	46 (67.6)	98 (66.7)	1			1					
<b>Increased risk of getting caught</b>												
No	42 (68.9)	34 (50.0)	76 (51.7)	2.211	1.075-4.545	0.030	2.065	1.099-3.882	0.023	0.934	0.526-1.660	0.817
Yes	19 (31.1)	34 (50.0)	71 (48.3)	1			1					
<b>Privacy reasons</b>												
No	35 (57.4)	33 (48.5)	85 (57.8)	1.428	0.712-2.862	0.315	0.982	0.537-1.796	0.953	0.688	0.386-1.225	0.203
Yes	26 (42.6)	35 (51.5)	62 (42.2)	1			1			1		
<b>Fear that people will disapprove of it</b>												
No	44 (72.1)	41 (60.30)	100 (68.0)	1.704	0.812-3.576	0.157	1.216	0.630-2.350	0.559	0.714	0.393-1.296	0.267
Yes	17 (27.9)	27 (39.7)	47 (32.0)	1			1			1		
<b>I don’t want other people to know it</b>												
No	44 (72.1)	52 (76.5)	107 (72.8)	0.796	0.361-1.758	0.573	0.968	0.496-1.886	0.923	1.215	0.623-2.369	0.567
Yes	17 (27.9)	16 (23.5)	40 (27.2)	1			1			1		
<b>Fear of getting fired</b>												
No	53 (86.9)	51 (75.0)	102 (69.4)	2.208	0.876-5.564	0.088	2.923	1.285-6.650	0.008	1.324	0.690-2.539	0.398
Yes	8 (13.1)	17 (25.0)	45 (30.6)	1			1					
<b>Respect for the feelings of nonusers</b>												
No	54 (88.5)	52 (76.5)	106 (72.1)	2.374	0.903-6.239	0.074	2.984	1.255-7.093	0.011	1.257	0.646-2.447	0.500
Yes	7 (11.5)	16 (23.5)	41 (27.9)	1			1			1		
<b>Setting an example for children</b>												
No	55 (90.2)	55 (80.9)	114 (77.6)	2.167	0.768-6.112	0.138	2.654	1.050-6.708	0.034	1.225	0.597-2.511	0.580
Yes	6 (9.8)	13 (19.1)	33 (22.4)	1			1			1		

Tested using Chi<sup>2</sup> test at a significance level of p<0.017.

Appendix

**Table 54a: Perceived attitudes of family and friends towards survey participants' medicinal cannabis use**

	Participants N(%)			Exclusive medical vs previous recreational	Exclusive medical vs current recreational	Previous recreational vs current recreational
	Exclusive medical	Previous recreational	Current recreational			
				p	p	P
<b>Reactions family</b>	<b>N=65</b>	<b>N=71</b>	<b>N=157</b>	0.001	<0.001	1.000
Very negative	0 (0.0)	1 (1.4)	7 (4.5)			
Negative	1 (1.5)	6 (8.5)	12 (7.6)			
Neutral, positive and negative	25 (38.5)	43 (60.6)	89 (56.7)			
Positive	26 (40.0)	13 (18.3)	39 (24.8)			
Very positive	13 (20.0)	8 (11.3)	10 (6.4)			
<b>Reactions friends</b>	<b>N=63</b>	<b>N=81</b>	<b>N=159</b>	0.582 (no pairwise comparisons)	0.582 (no pairwise comparisons)	0.582 (no pairwise comparisons)
Very negative	0 (0.0)	0 (0.0)	0 (0.0)			
Negative	0 (0.0)	3 (3.7)	2 (1.3)			
Neutral, positive and negative	24 (38.1)	35 (43.2)	63 (39.6)			
Positive	26 (41.3)	27 (33.3)	62 (39.0)			
Very positive	13 (20.6)	16 (19.8)	32 (20.1)			

Test: tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni at a significance level of p<0.05.

**Table 55a: Social setting of use of the past twelve months**

	Participants N(%)			Exclusive medical vs previous recreational	Exclusive medical vs current recreational	Previous recreational vs current recreational
	Exclusive medical	Previous recreational	Current recreational			
				p	p	P
<b>Location</b>	<b>N=78</b>	<b>N=88</b>	<b>N=175</b>			
<b>At home</b>				0.085	<0.001	0.011
Never	1 (1.3)	1 (1.1)	1 (0.6)			
Rarely	0 (0.0)	0 (0.0)	1 (0.6)			
Sometimes	0 (0.0)	3 (3.4)	5 (2.9)			
Often	8 (10.3)	20 (22.7)	74 (42.3)			
Always	69 (88.5)	64 (72.7)	94 (53.7)			
<b>At a party or social gathering</b>				<0.001	<0.001	<0.001
Never	67 (85.9)	40 (45.5)	34 (19.4)			
Rarely	5 (6.4)	19 (21.6)	37 (21.1)			
Sometimes	3 (3.8)	25 (28.4)	47 (26.9)			
Often	1 (1.3)	4 (4.5)	42 (24.0)			
Always	2 (2.6)	0 (0.0)	15 (8.6)			

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<b>At friends' homes</b>				0.001	<0.001	<0.001
Never	53 (67.9)	27 (30.7)	22 (12.6)			
Rarely	9 (11.5)	23 (26.1)	37 (21.1)			
Sometimes	11 (14.1)	29 (33.0)	63 (36.0)			
Often	4 (5.1)	9 (10.2)	45 (25.7)			
Always	1 (1.3)	0 (0.0)	8 (4.6)			
<b>At family's homes</b>				1.000	0.036	0.039
Never	56 (71.8)	60 (68.2)	93 (53.1)			
Rarely	7 (9.0)	15 (17.0)	35 (20.0)			
Sometimes	11 (14.1)	10 (11.4)	37 (21.1)			
Often	3 (3.8)	3 (3.4)	7 (4.0)			
Always	1 (1.3)	0 (0.0)	3 (1.7)			
<b>Public places outside</b>				0.074	<0.001	<0.001
Never	62 (79.5)	52 (59.1)	50 (28.6)			
Rarely	6 (7.7)	14 (15.9)	51 (29.1)			
Sometimes	4 (5.1)	15 (17.0)	47 (26.9)			
Often	5 (6.4)	7 (8.0)	22 (12.6)			
Always	1 (1.3)	0 (0.0)	5 (2.9)			
<b>Medical settings</b>				0.005	1.000	0.011
Never	58 (74.4)	82 (93.2)	136 (77.7)			
Rarely	7 (9.0)	3 (3.4)	22 (12.6)			
Sometimes	10 (12.8)	1 (1.1)	11 (6.3)			
Often	1 (1.3)	1 (1.1)	4 (2.3)			
Always	2 (2.6)	1 (1.1)	2 (1.1)			
<b>In bed</b>				0.516 (no pairwise comparisons)	0.516 (no pairwise comparisons)	0.516 (no pairwise comparisons)
Never	50 (64.1)	58 (65.9)	99 (56.6)			
Rarely	2 (2.6)	8 (9.1)	26 (14.9)			
Sometimes	9 (11.5)	10 (11.4)	26 (14.9)			
Often	6 (7.7)	7 (8.0)	14 (8.0)			
Always	11 (14.1)	5 (5.7)	10 (5.7)			
<b>In a car</b>				1.000	0.001	0.019
Never	70 (89.7)	74 (84.1)	122 (69.7)			
Rarely	4 (5.1)	7 (8.0)	21 (12.0)			
Sometimes	3 (3.8)	5 (5.7)	21 (12.0)			
Often	0 (0.0)	2 (2.3)	7 (4.0)			
Always	1 (1.3)	0 (0.0)	4 (2.3)			
<b>At work</b>				1.000	0.102	0.149
Never	69 (88.5)	78 (88.6)	137 (78.3)			
Rarely	2 (2.6)	4 (4.5)	15 (8.6)			

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Sometimes	6 (7.7)	4 (4.5)	14 (8.0)			
Often	0 (0.0)	1 (1.1)	4 (2.3)			
Always	1 (1.3)	1 (1.1)	5 (2.9)			
<b>At a pub, bar or nightclub</b>				0.345	<0.001	<0.001
Never	69 (88.5)	67 (76.1)	77 (44.0)			
Rarely	4 (5.1)	8 (9.1)	42 (24.0)			
Sometimes	2 (2.6)	9 (10.2)	42 (24.0)			
Often	1 (1.3)	4 (4.5)	12 (6.9)			
Always	2 (2.6)	0 (0.0)	2 (1.1)			
<b>At a Dutch coffeeshop</b>				0.003	<0.001	<0.001
Never	72 (92.3)	57 (64.8)	54 (30.9)			
Rarely	4 (5.1)	15 (17.0)	42 (24.0)			
Sometimes	1 (1.3)	9 (10.2)	46 (26.3)			
Often	0 (0.0)	3 (3.4)	15 (8.6)			
Always	1 (1.3)	4 (4.5)	18 (10.3)			
<b>Accompanied by</b>	<b>N=80</b>	<b>N=88</b>	<b>N=175</b>			
<b>Alone</b>				0.067 (no pairwise comparisons)	0.067 (no pairwise comparisons)	0.067 (no pairwise comparisons)
Never	8 (10.0)	3 (3.4)	4 (2.3)			
Rarely	4 (5.0)	5 (5.7)	9 (5.1)			
Sometimes	6 (7.5)	5 (5.7)	9 (5.1)			
Often	30 (37.5)	54 (61.4)	105 (60.0)			
Always	32 (40.0)	21 (23.9)	31 (17.7)			
<b>Friends</b>				0.002	<0.001	<0.001
Never	46 (57.5)	18 (20.5)	12 (6.9)			
Rarely	6 (7.5)	22 (25.0)	24 (13.7)			
Sometimes	20 (25.0)	31 (35.2)	73 (41.7)			
Often	5 (6.3)	15 (17.0)	58 (33.1)			
Always	3 (3.8)	2 (2.3)	8 (4.6)			
<b>Acquaintances</b>				0.379	<0.001	0.001
Never	56 (70.0)	43 (48.9)	47 (26.9)			
Rarely	4 (5.0)	21 (23.9)	46 (26.3)			
Sometimes	13 (16.3)	19 (21.6)	60 (34.3)			
Often	3 (3.8)	5 (5.7)	17 (9.7)			
Always	4 (5.0)	0 (0.0)	5 (2.9)			
<b>Family</b>				1.000	0.013	0.017
Never	51 (63.7)	53 (60.2)	71 (40.6)			
Rarely	7 (8.8)	15 (17.0)	43 (24.6)			
Sometimes	15 (18.8)	15 (17.0)	42 (24.0)			



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Often	7 (8.8)	2 (2.3)	17 (9.7)			
Always	0 (0.0)	3 (3.4)	2 (1.1)			
<b>Strangers</b>				1.000	<0.001	<0.001
Never	66 (82.5)	66 (75.0)	78 (44.6)			
Rarely	4 (5.0)	10 (11.4)	58 (33.1)			
Sometimes	3 (3.8)	10 (11.4)	32 (18.3)			
Often	4 (5.0)	2 (2.3)	6 (3.4)			
Always	3 (3.8)	0 (0.0)	1 (0.6)			
<b>Medical professionals</b>				0.267	0.036	1.000
Never	63 (78.8)	77 (87.5)	129 (73.7)			
Rarely	3 (3.8)	7 (8.0)	25 (14.3)			
Sometimes	6 (7.5)	2 (2.3)	15 (8.6)			
Often	5 (6.3)	2 (2.3)	5 (2.9)			
Always	3 (3.8)	0 (0.0)	1 (0.6)			

Test: tested using a Kruskal-Wallis test and post hoc pair wise tests Bonferroni at a significance level of  $p < 0.05$ .

## Appendix 2: Online questionnaire<sup>44</sup>

# The use of cannabis for health purposes

### Ghent University

This study aims to improve our understanding of the use of cannabis for health purposes in Flanders.

#### The study

Alongside recreational cannabis use, cannabis is also used as a medicine for various conditions. The Institute for Social Drug Research (ISD) of UGhent conducts a study on "Self-reported medicinal cannabis use in Flanders", financed by the Research Foundation- Flanders (FWO). Since the use of cannabis is not allowed in Belgium, we hardly have any information about whether and how people use cannabis to relieve their health problems. Consequently, an important source of information are people themselves who use cannabis for health purposes. This study aims to gain more knowledge about cannabis use for health reasons in Flanders based on the experiences of users. To achieve this aim, the researchers have developed a questionnaire.

#### Who are we looking for?

Your story is very important for the purpose of this study.

We are looking for people from Flanders who

- use cannabis for health purposes
- AND/OR have used cannabis in the past for health purposes
- AND/OR have tried cannabis for health reasons
- AND be at least 18 years old

#### Important information

This study has been approved by the ethics committee of the Faculty of Medicine and Health Sciences, Ghent University. Participating in this study means that you complete the questionnaire. Your data will be treated strictly confidential and anonymous. Completing the questionnaire is entirely voluntary. Even after you have started the questionnaire, you can end it at any time without having to give a reason. If you have any questions about the study, you can always contact us. Participating in this questionnaire does not entail additional costs, but it also does not give you any financial or other benefits. Your cooperation is nevertheless important; your participation forms the basis of a body of knowledge that can lead to a better understanding of the reasons why people use cannabis for health purposes in Flanders.

#### Questions?

#### Contact us:

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Supervisor: Prof. Dr. Tom Decorte

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<sup>44</sup> Only the questions of which the results are discussed in this dissertation are shown.

### **Participation**

Do you meet the eligibility criteria? Do you want to participate in scientific research?

Participation means that you complete a questionnaire online. The questionnaire is about cannabis use patterns, motives for use, health and medical treatments. It is important that you follow the instructions that are presented on the screen as accurately as possible. These instructions are always presented in light blue below the question. It is also important that you answer the questions without consulting others. There are no right or wrong answers and we are only interested in your personal perspective. Filling in the questionnaire takes approximately 40 minutes. You can always pause the questionnaire and resume at a later time. Your answers will be saved and you start where you paused last time. Finally, we want to inform you that some internet pages in this questionnaire have to load before the questions become visible.

Thank you in advance for your interest!

Frédérique

### **Information at the start of the survey**

Before you begin, we want to explain a couple of the terms that we use in the questionnaire in order to avoid confusion.

*When we use the term cannabis, we mean cannabis in all forms including herbal cannabis, oils, tinctures, hash, synthetics, cannabinoid medicines or other cannabis derivatives (e.g. edibles, extracts).*

When we use the sentence ‘cannabis use for health reasons’, we mean *the use of cannabis for relief of health symptoms, also known as ‘medicinal cannabis use’*.

## Appendix

### Start survey

#### Eligibility criteria

\* Are you 18-years-old or older?

(select one answer)

- Yes
- No

\* Select the statement that applies to you

(select one answer)

- I currently use cannabis for health purposes
- I used cannabis for health purposes in the past, but I quit
- I have never used cannabis for health purposes

\* Why did you stop using cannabis for health purposes?

(multiple answers possible)

- Inability to obtain supply
- Concerns for law enforcement
- No longer needed because complaints were gone
- Unaffordable
- Negative reactions from others
- Concerns for losing job
- Ineffectiveness
- Adverse effects
- Deteriorating effects on health
- Concerns for dependence
- Cannabis was no longer effective
- I prefer not to answer
- Other

#### Sociodemographic characteristics

\* What is your marital status?

(select one answer)

- Single
- Living together with a partner
- Married
- In a relationship, but not living together
- Divorced/ no longer living together with a partner
- Widowed
- I don't know
- I prefer not to answer

\* What is your highest degree?

(select one answer)

- No diploma
- Primary education
- Secondary education
- Bachelor
- Master or higher
- I don't know
- I prefer not to answer
- Other

**\* Are you employed?**

(select one answer)

- Yes
- No
- I prefer not to answer

**\* What is your profession?**

(multiple answers possible)

- Blue collar worker/ worker
- White collar worker/ employee
- Senior employee
- Self-employed
- Executive
- Civil servant
- I prefer not to answer
- Other

**\* What is your working time?**

(select one answer)

- Full-time
- Less than full-time, but more than half-time
- Half-time
- Less than half-time
- I don't know
- I prefer not to answer

**\* What is your unemployment status?**

(select one answer)

- Incapacity for work
- Unemployed (looking for a job)
- Retired
- Student
- Stay at home parent or carer
- I don't know
- I prefer not to answer
- Other

**\* What is your gender?**

(select one answer)

- Male
- Female

**\* What is your year of birth?**

(Enter a date)

**\* What is your average net income of you and other family members (e.g. partner) together per month? Also include social benefits, child benefits and additional income such as rental income or interests.**

(select one answer)

- No income yet
- Less than €1000
- €1000 to €1999
- €2000 to €2999
- €3000 to €3999
- €4000 or more
- I don't know
- I prefer not to answer

## Appendix

**\* What is your nationality?**

(select one answer)

- Belgian
- Dutch
- Turkish
- Moroccan
- French
- Italian
- German
- British
- Spanish
- Romanian
- I prefer not to answer
- Other

### Cannabis use

**\* How old were you (approximately) when you first used cannabis (for whatever reason)?**

(select one answer)

Drop-down list with the numbers from one to 99, and the answer options 'I don't know' and 'I prefer not to answer'.

**\* How old were you (approximately) when you first used cannabis for health purposes?**

(select one answer)

Drop-down list with the numbers from one to 99, and the answer options 'I don't know' and 'I prefer not to answer'.

### Cannabis products and methods of ingestion

**\* There are many cannabis products. Indicate for each product how often you have used it in the last 12 months.\***

(select one answer per row)

	Never	Seldom	Sometimes	Often	Always
Dried female flowers/ marijuana	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CBD oil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cannabis oil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hash	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cannabis infused ointment, balm or lotion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Raw cannabis juice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sativex®	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\*Hash = pressed or kneaded resin, Cannabis oil = oil extracted from the cannabis plant, CBD oil = cannabis oil with a high percentage of cannabidiol (CBD), Sativex = oromucosal spray based on cannabis extracts, Raw cannabis juice = juice from unprocessed cannabis plants.

**\* There are different ways to ingest cannabis. For each administration method, indicate how often you have used it in the last 12 months.**

(select one answer per row)

	Never	Seldom	Sometimes	Often	Always
Smoked with a joint	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oral ingestion through drops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inhaled with a vaporizer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eaten in edibles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smoked with a hookah	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drank as tea or another drink	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cutaneous use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smoked with a blunt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chewing, eating or drinking raw cannabis flowers or leaves	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oral ingestion through capsules	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oral ingestion through a spray	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[For clarity, participants were shown images of each ingestion method]

\* Select the administration method that you use most often

(select one answer)

- Smoked with a joint
- Oral ingestion through drops
- Inhaled with a vaporizer
- Eaten in edibles
- Smoked with a hookah
- Drank as tea or another drink
- Cutaneous use
- Smoked with a blunt
- Chewing, eating or drinking raw cannabis flowers or leaves
- Oral ingestion through capsules
- Oral ingestion through a spray
- I don't know
- I prefer not to answer
- Other

\* Why do you use this administration method?

(multiple answers possible)

- Easy to find the correct dose
- Easy to use
- Provides the best symptom relief
- Effects occur faster
- Out of habit
- Less harmful than other administration methods
- Less side effects
- More affordable
- Effects last longer
- Easy to hide
- I don't know
- Other

\* What are disadvantages of the ingestion method that you use most often?

(multiple answers possible)

- Harmfulness to health
- No disadvantages
- Difficulties to conceal
- Costs of the administration method
- Side effects
- Difficult to find correct dose
- Less effective than other administration methods
- Effects last too short
- Effects start too slow
- Difficult to use
- Other

\* Do you mix cannabis with tobacco?

(select one answer)

- Never
- Seldom
- Sometimes
- Often
- Always

## Appendix

### Dosis and frequency of use

\* How often did you use cannabis on average in the last 12 months?

(select one answer)

- One time a year
- A few times a year
- A few times a month
- 1 to 2 days a week
- 3 to 4 days a week
- 5 to 6 days a week
- Daily
- I don't know
- I prefer not to answer

\* When do you usually use cannabis during the day?

(select one answer)

- After 6 pm and before midnight at midnight (in the evening)
- Between 6 am and 12 pm (in the morning)
- Between 12 pm and 6 pm (afternoon)
- Between 12 am and 06 am (at night)
- From morning till evening
- At any time of the day when I need it to relieve my symptoms
- Right before going to sleep
- At regular intervals during the day
- I don't know
- Other

\* How much grams of cannabis do you use on average in a week?

(select one answer) (If you only use cannabis in liquid form (e.g.: cannabis oil, Sativex), select the answer 'Does not apply')

Drop-down list with the numbers from zero to 100, and the answer options 'Does not apply', 'I don't know' and 'I prefer not to answer'.

\* How much milliliters of cannabis do you use on average in a week?

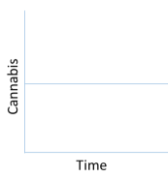
(select one answer) (If you do not use cannabis in liquid form (e.g.: cannabis oil, Sativex), select the answer 'Does not apply')

Drop-down list with the numbers from zero to 100, and the answer options 'Does not apply', 'I don't know' and 'I prefer not to answer'.

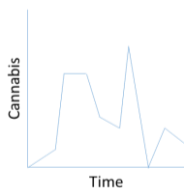
\* Since the beginning of my cannabis use, the amount of cannabis that I use is:

(select one answer)

- Stable

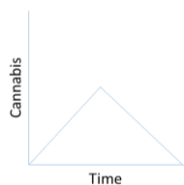


- Varying

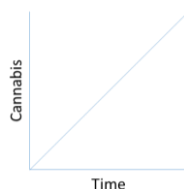


- Up to down

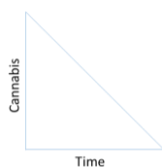




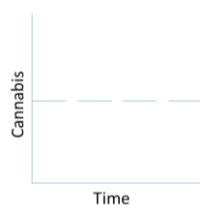
- Slowly more



- Slowly less



- Intermittent



- I don't know
- I prefer not to answer
- Other

### Symptoms and conditions

\*This is a long list of reasons why people can use cannabis. Indicate for which symptoms you use or have tried cannabis.

(Multiple answers possible)

- acne
- acute pain
- anger
- anxiety
- attention or concentration problems
- bloating/ flatulence
- breathing problems
- chronic pain
- compulsive behaviour or thoughts
- constipation
- craving for alcohol or drugs
- decreased appetite
- decreased sex drive or libido
- diarrhoea
- difficulties in making decisions
- dizziness/ vertigo
- eczema
- elevated intraocular pressure
- (epileptic) seizures
- fainting

## Appendix

- fatigue/ low energy
- feeling confused
- feeling depressed/ sadness
- feeling guilty or ashamed
- feeling helpless or hopeless
- feeling overwhelmed
- feeling worthless
- frequent crying
- frequent urination
- gastric acid
- hallucinations/delusions/bizarre thoughts
- hyperactivity/ excessive energy
- impotence
- incontinence
- increased appetite
- increased heartrate/ palpations
- Inflammations
- itching
- loneliness
- memory problems
- mood swings
- muscle weakness
- nervousness
- nightmares, night terror or night sweats
- not enjoying hobbies or other activities
- numbness/tingling
- panic/ panic attacks
- phobias/intense fears
- psychoses
- restlessness
- sleep problems
- social anxiety
- spasms/ fasciculation
- stiffness
- stress
- stuttering/ stammering
- suspicion/distrust
- tinnitus
- tremor/tremble
- vision or eye problems
- vomiting/nausea
- Other

\* Indicate to what extent the use of cannabis helped for these symptoms or did not help  
(select one answer per row)

	No improvement	Minimal improvement	Moderate improvement	Much improvement	Complete improvement	I don't know
acne	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
acute pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
anger	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
anxiety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
attention or concentration problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
bloating/ flatulence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
breathing problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
chronic pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
compulsive behaviour or thoughts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
constipation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
craving for alcohol or drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
decreased appetite	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

decreased sex drive or libido	○	○	○	○	○	○
diarrhoea	○	○	○	○	○	○
difficulties in making decisions	○	○	○	○	○	○
dizziness/ vertigo	○	○	○	○	○	○
eczema	○	○	○	○	○	○
elevated intraocular pressure	○	○	○	○	○	○
(epileptic) seizures	○	○	○	○	○	○
fainting	○	○	○	○	○	○
fatigue/ low energy	○	○	○	○	○	○
feeling confused	○	○	○	○	○	○
feeling depressed/ sadness	○	○	○	○	○	○
feeling guilty or ashamed	○	○	○	○	○	○
feeling helpless or hopeless	○	○	○	○	○	○
feeling overwhelmed	○	○	○	○	○	○
feeling worthless	○	○	○	○	○	○
frequent crying	○	○	○	○	○	○
frequent urination	○	○	○	○	○	○
gastric acid	○	○	○	○	○	○
Hallucinations / delusions / bizarre thoughts	○	○	○	○	○	○
Hyperactivity / excessive energy	○	○	○	○	○	○
impotence	○	○	○	○	○	○
incontinence	○	○	○	○	○	○
increased appetite	○	○	○	○	○	○
increased heartrate / palpations	○	○	○	○	○	○
Inflamations	○	○	○	○	○	○
itching	○	○	○	○	○	○
loneliness	○	○	○	○	○	○
memory problems	○	○	○	○	○	○
mood swings	○	○	○	○	○	○
muscle weakness	○	○	○	○	○	○
nervousness	○	○	○	○	○	○
nightmares, night terror or night sweats	○	○	○	○	○	○
not enjoying hobbies or other activities	○	○	○	○	○	○
numbness/tingling	○	○	○	○	○	○
panic/ panic attacks	○	○	○	○	○	○
phobias/intense fears	○	○	○	○	○	○
psychoses	○	○	○	○	○	○
restlessness	○	○	○	○	○	○
sleep problems	○	○	○	○	○	○
social anxiety	○	○	○	○	○	○
spasms/ fasciculation	○	○	○	○	○	○
stiffness	○	○	○	○	○	○
stress	○	○	○	○	○	○
stuttering/ stammering	○	○	○	○	○	○
suspicion/distrust	○	○	○	○	○	○
tinnitus	○	○	○	○	○	○
tremor/tremble	○	○	○	○	○	○
vision or eye problems	○	○	○	○	○	○
vomiting/nausea	○	○	○	○	○	○
Other	○	○	○	○	○	○
<input type="text"/>						

## Appendix

\* Do you suffer from a particular condition for which you have used cannabis? (e.g.: chronic pain, allergy, ALS, high blood pressure, anxiety disorder, depression, ADHD, etc.)

(select one answer)

- Yes
- No
- I don't know
- I prefer not to answer

\* Below you find a long list with conditions from which people can suffer. Indicate in the list below for which condition(s) you have used cannabis.

(multiple answers possible)

- ADHD/ ADD
- Allergy
- ALS
- Anorexia
- Arthritis/ Rheumatism
- Arthrosis
- Asthma
- autism
- Auto-immune disease
- Bipolar disorder
- Cachexia
- Cancer
- carpal tunnel syndrome
- Chronic Lyme
- Chronic pain
- Depression
- diabetes
- Drug abuse/dependence
- dysmenorrhoea of PMS
- Dystonia
- epilepsy/ epileptic attacks
- Fibromyalgia
- Generalised anxiety disorder
- Glaucoma
- Head trauma
- hepatitis C
- hernia
- HIV/aids
- Hypertension
- IBS/ Crohn's disease
- incontinence
- Injury caused by accident
- lung disorder
- ME/CFS
- Migraine
- Multiple sclerosis
- Neuropathy
- OCD
- opiate addiction/ dependence
- osteoporosis
- paraplegia
- Parkinson's disease
- Persistent muscle spasms
- persistent nausea
- Postoperative injury
- PTSD
- schizophrenia
- sclerosis
- Skin disorders
- Sleep disorder

- Social anxiety
- specific anxiety disorder
- Tourette syndrome
- ulcerative colitis
- weight loss
- Other:

\* How long have you been suffering from this condition(s)?  
 (enter the number of years and/or months for each condition)

	Years	Months
ADHD/ ADD	<input type="text"/>	<input type="text"/>
Allergy	<input type="text"/>	<input type="text"/>
ALS	<input type="text"/>	<input type="text"/>
Anorexia	<input type="text"/>	<input type="text"/>
Arthritis/ Rheumatism	<input type="text"/>	<input type="text"/>
Arthrosis	<input type="text"/>	<input type="text"/>
Asthma	<input type="text"/>	<input type="text"/>
autism	<input type="text"/>	<input type="text"/>
Auto-immune disease	<input type="text"/>	<input type="text"/>
Bipolar disorder	<input type="text"/>	<input type="text"/>
Cachexia	<input type="text"/>	<input type="text"/>
Cancer	<input type="text"/>	<input type="text"/>
carpal tunnel syndrome	<input type="text"/>	<input type="text"/>
Chronic Lyme	<input type="text"/>	<input type="text"/>
Chronic pain	<input type="text"/>	<input type="text"/>
Depression	<input type="text"/>	<input type="text"/>
diabetes	<input type="text"/>	<input type="text"/>
Drug abuse/dependence	<input type="text"/>	<input type="text"/>
dysmenorrhoea of PMS	<input type="text"/>	<input type="text"/>
Dystonia	<input type="text"/>	<input type="text"/>
epilepsy/ epileptic attacks	<input type="text"/>	<input type="text"/>
Fibromyalgia	<input type="text"/>	<input type="text"/>
Generalised anxiety disorder	<input type="text"/>	<input type="text"/>
Glaucoma	<input type="text"/>	<input type="text"/>
Head trauma	<input type="text"/>	<input type="text"/>
hepatitis C	<input type="text"/>	<input type="text"/>
hernia	<input type="text"/>	<input type="text"/>
HIV/aids	<input type="text"/>	<input type="text"/>
Hypertension	<input type="text"/>	<input type="text"/>
IBS/ Crohn's disease	<input type="text"/>	<input type="text"/>
incontinence	<input type="text"/>	<input type="text"/>
Injury caused by accident	<input type="text"/>	<input type="text"/>
lung disorder	<input type="text"/>	<input type="text"/>
ME/CFS	<input type="text"/>	<input type="text"/>
Migraine	<input type="text"/>	<input type="text"/>
Multiple sclerosis	<input type="text"/>	<input type="text"/>
Neuropathy	<input type="text"/>	<input type="text"/>
OCD	<input type="text"/>	<input type="text"/>
opiate addiction/ dependence	<input type="text"/>	<input type="text"/>
osteoporosis	<input type="text"/>	<input type="text"/>
paraplegia	<input type="text"/>	<input type="text"/>
Parkinson's disease	<input type="text"/>	<input type="text"/>
Persistent muscle spasms	<input type="text"/>	<input type="text"/>
persistent nausea	<input type="text"/>	<input type="text"/>
Postoperative injury	<input type="text"/>	<input type="text"/>
PTSD	<input type="text"/>	<input type="text"/>
schizophrenia	<input type="text"/>	<input type="text"/>
sclerosis	<input type="text"/>	<input type="text"/>

## Appendix

Skin disorders	<input type="checkbox"/>	<input type="checkbox"/>
Sleep disorder	<input type="checkbox"/>	<input type="checkbox"/>
Social anxiety	<input type="checkbox"/>	<input type="checkbox"/>
specific anxiety disorder	<input type="checkbox"/>	<input type="checkbox"/>
Tourette syndrome	<input type="checkbox"/>	<input type="checkbox"/>
ulcerative colitis	<input type="checkbox"/>	<input type="checkbox"/>
weight loss	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>

\* The following condition(s) were diagnosed by the following people:  
(multiple answers possible)

	Medical doctor or specialist (e.g.: general practitioner, oncologist, psychiatrist, neurologist, etc.)	Other medical professional (e.g.: nurse, psychologist, etc.)	Alternative healthcare practitioner (e.g.: homeopath, acupuncturist, etc.)	Friends or family	Myself / self- diagnosis I don't know	I don't know
ADHD/ ADD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Allergy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ALS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anorexia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arthritis/ Rheumatism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arthrosis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Asthma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
autism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Auto-immune disease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bipolar disorder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cachexia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cancer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
carpal tunnel syndrome	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chronic Lyme	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chronic pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Depression	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
diabetes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drug abuse/dependence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
dysmenorrhoea of PMS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dystonia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
epilepsy/ epileptic attacks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fibromyalgia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Generalised anxiety disorder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Glaucoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Head trauma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
hepatitis C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
hernia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HIV/aids	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hypertension	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IBS/ Crohn's disease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
incontinence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Injury caused by accident	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
lung disorder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ME/CFS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Migraine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multiple sclerosis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Neuropathy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OCD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
opiate addiction/ dependence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
osteoporosis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
paraplegia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parkinson's disease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Persistent muscle spasms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
persistent nausea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Postoperative injury	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PTSD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
schizophrenia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
sclerosis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skin disorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sleep disorder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social anxiety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
specific anxiety disorder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tourette syndrome	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ulcerative colitis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
weight loss	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

\* Has your quality of life changed since you started using cannabis for health purposes?

(select one answer)

- My quality of life has been fully restored
- My quality of life has improved a lot
- My quality of life has improved somewhat
- My quality of life has not changed
- My quality of life has worsened somewhat
- My quality of life has worsened a lot
- My quality of life is worse than ever
- I don't know

### Health risks and side effects

\* We present you a list of effects that cannabis can cause. When you experience these effects, please indicate the impact of these effects on your quality of life.

(If you never experience a particular effect, indicate 'not applicable')

(select one answer per row)

	Very positive	Positive	Somewhat positive	Neutral	Somewhat negative	Negative	Very negative	Not applicable
Drowsiness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling 'high'	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased appetite	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dry mouth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being confused/ forgetful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased heartrate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weakness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decreased appetite	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Blurred vision	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dizziness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fear, paranoia, hallucinations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Motives for use

\* This is a list of motives that people may have to use cannabis. When you think of the times you have used cannabis in the last 12 months, how often have you used it for the following reasons:

(select one answer per row)

	Never	Seldom	Sometimes	Often	Always	I don't know
To control symptoms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical relaxation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To help you sleep	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mental relaxation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To get peace of mind	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To enjoy the effects of it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To enjoy leisure activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To divert the attention from my complaints	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To allow you to think differently	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To get high	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Because it is fun	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To let off steam	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix

It is nice to do with friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To improve your focus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To get more energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To get more inspiration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To forget your problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Because it was a special occasion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To relieve boredom	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To make you feel more confident	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To counteract other medicines' side effects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To soften the effects of other psychoactive substances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Because you were under the influence of alcohol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To be able to take medicines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* Are there periods in which you have not used cannabis?  
(select one answer)

- Yes
- No
- I prefer not to answer

\* Why did you temporarily stop using cannabis?  
(multiple answers possible)

- To check if I could live without it, to test if I was dependent on cannabis
- Inability to find supply
- Too expensive
- Concerns about law enforcement
- No longer needed for medicinal purposes
- Concerns about dependence
- Troubles with law enforcement
- No specific reason
- Others' negative responses
- Concerns about job security
- Unpleasant adverse events
- Ineffectiveness
- Health deteriorated
- Other

\* What convinced you to use cannabis for health purposes?  
(multiple answers possible)

- Experienced the beneficial effects during recreational cannabis use
- Have heard/ read about it in the media
- Have read about it in a scientific article
- Nothing else relieved symptoms
- It was suggested by other users/ patients
- It was suggested by friends, family or acquaintances
- It was suggested by a physician
- It was suggested by another medical professional
- I don't know
- Other



## Substitution

\*I use cannabis to replace (partially or completely):

(multiple answers possible)

- Alcohol
- Medicines
- Cigarettes (tobacco)
- Other illegal drugs
- Not using cannabis as a substitute
- I don't know
- I prefer not to answer
- Other

\* Indicate in the list below how often you have used the following substances since the start of your cannabis use:

(select one answer per row)

(If you have never used a particular substance, select 'not applicable')

	No longer	Less	Unchanged	More	Much more	I don't know	Not applicable
Alcohol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medicines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cigarettes (tobacco)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other illegal drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## The 'high'

\* Select the statement that applies to you:

(select one answer)

- I have never felt 'high' due to cannabis
- I felt 'high' in the past due to cannabis, but not anymore
- I feel 'high' (at times) when using cannabis
- I don't know
- I prefer not to answer

\* How often did you feel 'high' the past 12 months when you were using cannabis?

(select one answer)

- Never
- Rarely
- Occasionally
- Frequently
- Always
- I don't know
- I prefer not to answer

\* Select the statement with which you agree most:

(select one answer)

I think the 'high' is:

- ... never a pleasant effect when I use cannabis for health purposes
- ... rarely a pleasant effect when I use cannabis for health purposes
- ... sometimes a pleasant effect when I use cannabis for health purposes
- ... often a pleasant effect when I use cannabis for health purposes
- ... always a pleasant effect when I use cannabis for health purposes
- I don't experience a high when I use cannabis for health purposes
- I don't know
- I prefer not to answer

\* Please indicate the extent to which you agree with the statements below:

(select one answer per row)

	Strongly disagree	Disagree	Neither agree nor agree	Agree	Strongly agree
Cannabis' psychoactive effects have changed over time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The 'high' is of therapeutic value	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use cannabis to become 'high'	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix

### Recreational cannabis use

\* Select the statement that applies to you

(select one answer per row)

- I currently use cannabis for recreational purposes
- I used cannabis for recreational purposes in the past, but no longer
- I have never used cannabis for recreational purposes
- I don't know

\* Respond to the following statements with 'yes' or 'no'

	Yes	No	I don't know
I have used cannabis for recreational purposes prior to using cannabis for health purposes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I used cannabis for recreational purposes I have experienced the beneficial effects of cannabis myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* The cannabis dose when I use for recreational purposes is compared to the dose when I use for health purposes:

(select one answer)

- Much higher
- Higher
- The same
- Lower
- Much lower
- I don't know

\* Select the method of ingestion you use most frequently when using cannabis for recreational purposes:

(select one answer)

- Smoked with a joint
- Oral ingestion through drops
- Inhaled with a vaporizer
- Eaten in edibles
- Smoked with a hookah
- Drank as tea or another drink
- Cutaneous use
- Smoked with a blunt
- Chewing, eating or drinking raw cannabis flowers or leaves
- Oral ingestion through capsules
- Oral ingestion through a spray
- I don't know
- I prefer not to answer
- Other

\* How often did you use cannabis for recreational purposes the past 12 months on average?

(select one answer)

- One time a year
- A few times a year
- A few times a month
- 1 to 2 days a week
- 3 to 4 days a week
- 5 to 6 days a week
- Daily
- I don't know
- I prefer not to answer

\* Indicate how often the following statements apply to you:

(select one answer per row)

	Never	Seldom	Sometimes	Often	Always	I don't know
Effects experienced when using cannabis for health purposes are different from using cannabis for recreational purposes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The setting where I use cannabis for health purposes is different from the setting where I use cannabis for recreational purposes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use cannabis for health purposes accompanied with other people than when I use it for recreational purposes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* Please indicate the extent to which you agree with the following statements about recreational cannabis use:

(select one answer per row)

	Strongly disagree	Disagree	Neither agree nor agree	Agree	Strongly agree	I don't know
Recreational cannabis use can be therapeutically valuable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recreational cannabis use can sometimes be considered as medical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recreational and medicinal cannabis use are difficult to distinguish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am an opponent of recreational cannabis use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recreational cannabis use impairs health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When using cannabis would become legal I would (still) use it recreationally	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I would be freed from my complaints and conditions, I would definitely stop using cannabis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Stigma and social context

\* Do you hide your cannabis use from the following people?

(If you don't have any children for example, please select 'not applicable')

(select one answer per row)

	Yes, (from all)	Yes, (but not from all)	No, (from no one)	Not applicable	I don't know
Partner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Colleagues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strangers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* For which reasons do you conceal your use?

(multiple answers possible)

- Avoiding judgement
- Increased risk of getting caught
- Privacy reasons
- Fear that people will disapprove of it
- I don't want other people to know it
- Fear of getting fired
- Respect for the feelings of nonusers
- Setting an example for children
- Other

## Appendix

\* What is your family's attitude towards your cannabis use for health purposes?

(select one answer)

- Very negative
- Negative
- Mixed, both positive and negative
- Positive
- Very positive
- I don't know
- I prefer not to answer

\* What are your friends' attitude towards your cannabis use for health purposes?

(select one answer)

- Very negative
- Negative
- Mixed, both positive and negative
- Positive
- Very positive
- I don't know
- I prefer not to answer

\* Below you find a list of types of people who may be present when you use cannabis. For each answer, indicate how often you have used cannabis in their presence in the last 12 months and how often you have used it alone.

(select one answer per row)

	Never	Seldom	Sometimes	Often	Always	Not applicable
Alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Acquaintances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strangers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical professionals (e.g. physicians, nurses)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* Below you find a list of locations. Please indicate for each location how often you have used cannabis there the past 12 months:

(select one answer per row)

	Never	Seldom	Sometimes	Often	Always
At home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At friends' homes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At a party or social gathering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public places outside	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In bed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At a Dutch coffee shop	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At family's homes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At a pub, bar or nightclub	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In a car	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical settings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* With how many people do you spend your leisure time with who use cannabis for recreational purposes?

(select one answer)

- Nobody
- The minority
- About half
- The majority
- Everybody
- I don't know
- I prefer not to answer

Physicians

\* Do you have a general practitioner?

(select one answer)

- Yes
- No

\* Is your general practitioner informed about your cannabis use?

(select one answer)

- Yes
- No
- I don't know
- I prefer not to answer

\* Why did you not discuss cannabis with your general practitioner?

(multiple answers possible)

- Lack of knowledge on cannabis
- Illegal status of cannabis
- Unnecessary for general practitioner to be informed
- General practitioner will respond negatively
- Fear that relationship will be jeopardised
- Lack of interest in cannabis
- Never considered discussing it
- Not knowing physician well enough
- Physician never asked it
- Previous negative experiences with physicians
- I don't know
- I prefer not to answer
- Other

\* Please indicate the extent to which you agree with the statements below

(select one answer per row)

	Strongly disagree	Disagree	Neither agree nor agree	Agree	Strongly agree
My general practitioner is understanding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My general practitioner disapproves of my cannabis use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Informing my general practitioner about my cannabis use jeopardised our relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My general practitioner believes in the therapeutic potential of cannabis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Initially, my general practitioner advised me to use cannabis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* Select the statement that applies to you regarding a prescription for cannabis:

(select one answer)

- I never asked a physician for a prescription
- I asked one physician for a prescription, but he or she refused
- I have a prescription for which I only had to consult one physician
- I have a prescription, but I needed to consult more than one physician, because some of them refused to prescribe
- I asked more than one physician to prescribe cannabis, but they all refused
- Other

\* Please indicate the extent to which you agree with the statements below:

(select one answer per row)

	Strongly disagree	Disagree	Neither agree nor agree	Agree	Strongly agree
I receive medical instructions from a physician regarding my use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am properly supervised by a physician regarding my use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix

### Health

\* How would you describe your health in general?

(select one answer)

- Excellent
- Very good
- Good
- Fair
- Poor

\* The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

(select one answer per row)

	Yes, limited a lot	Yes, limited a little	No, not limited at all	I don't know	I prefer not to answer
Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lifting or carrying groceries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Climbing several flights of stairs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Climbing one flight of stairs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bending, kneeling, or stooping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Walking more than a mile	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Walking several blocks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Walking one block	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bathing or dressing yourself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling.

“How much of the time during the past four weeks . . .”

(select one answer per row)

	Never	Seldom	Sometimes	Often	Always
Have you been a very nervous person?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Have you felt so down in the dumps that nothing could cheer you up?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Have you felt calm and peaceful?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Have you felt downhearted and blue?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Have you been a happy person?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Conventional medicines

\* Do you currently take medicines on a regular basis alongside cannabis?

(select one answer)

- Yes
- No
- I don't know
- I prefer not to answer

\* Is there a medicine that you use for the same purposes as for which you use cannabis?

(select one answer)

- Yes
- No
- I don't know

\* Why do you use medicines for the same type of purposes for which you use cannabis?

(multiple answers possible)

- Instructed by a physician
- Medicines are legal
- Medicines are more accessible
- Using only cannabis is insufficient for my complaints
- Medicines are cheaper than cannabis
- Medicines are socially accepted
- Medicines and cannabis strengthen each other's effects
- Medicines are easier to use than cannabis
- Out of habit
- I don't know
- Other

\* Compare the effectiveness of cannabis with the medicines that you use for the same purposes as for which you use cannabis.

(select one answer)

- Medicines are a lot more effective than cannabis
- Medicines are somewhat more effective than cannabis
- Medicines and cannabis are equally effective
- Cannabis is somewhat more effective than medicines
- Cannabis is a lot more effective than medicines
- Only cannabis is effective
- I don't know
- Other

\* How would you describe the adverse effects of cannabis compared to the adverse effects of medicines that you use for the same purposes as for which you use cannabis.

(select one answer)

- Cannabis' adverse effects are a lot worse than those of medicines
- Cannabis' adverse effects are somewhat worse than those of medicines
- The adverse effects are about the same
- Medicines' adverse effects are somewhat worse than those of cannabis
- Medicines' adverse effects are a lot worse than those of cannabis
- Neither cannabis, nor medicines have adverse effects
- I don't know
- Other

### Substance use

\* Select in the list below the substances you have used in your life

(please do not select the medicines that you take on prescription)

(multiple answers possible)

- Alcohol
- Cigarettes (tobacco)
- Cocaine
- MDMA
- Psilocybin
- Amphetamine
- LSD
- Tranquilizers for non-medical use
- Ketamine
- Heroin
- GHB
- Other opioids for non-medical use
- Methamphetamine
- Synthetic cannabinoids
- Methadone
- I prefer not to answer
- Other

\* Select the substances which you have used in the past 12 months

(multiple answers possible)

- Alcohol
- Cigarettes (tobacco)
- Cocaine
- MDMA
- Psilocybin
- Amphetamine
- LSD
- Tranquilizers for non-medical use
- Ketamine
- Heroin
- GHB
- Other opioids for non-medical use
- Methamphetamine
- Synthetic cannabinoids
- Methadone
- I prefer not to answer
- Other

End survey

**THANK YOU!**

We thank you very much for completing this questionnaire!

In this study, personal interviews are conducted alongside the questionnaire. If the researcher can contact you for an interview, you can enter your e-mail address below. You can enter your e-mail address in the lower box if you wish to receive the study findings.

You can always contact the researcher at the following email address: [frederique.bawin@ugent.be](mailto:frederique.bawin@ugent.be). We would appreciate it if you would tell your friends about this study.

Frédérique Bawin

e-mail address for participating in an interview

e-mail address for receiving results

(Your e-mail address will only be used to contact you. It is not saved as personal information and does not serve to identify you.)

If you have any comments, suggestions or criticisms of any kind that you want to share with the researchers, you can enter them below. Your thoughts are valuable for our study.

Thank you, your answers have been saved and sent anonymously.



## Appendix 3: Informed consent

### *Deelname aan onderzoek ‘Zelf-gerapporteerd medicinaal cannabisgebruik in Vlaanderen. Een studie van gebruikersprofielen en patronen van gebruik.’*

#### *Informed consent form*

Beste respondent,

Recent is er een onderzoek gestart bij het Instituut voor Sociaal Drugsonderzoek van Universiteit Gent rond zelf-gerapporteerd medicinaal cannabisgebruik in Vlaanderen. We hebben veel interesse in uw ervaringen met en attitudes ten aanzien van cannabisgebruik om gezondheidsredenen. Voor u beslist om deel te nemen aan het interview in het kader van dit onderzoek, willen we meer vertellen waarom we de interviews afnemen en wat een deelname inhoudt. Meer informatie over het onderzoek kan u terugvinden op de website van het project. Hieronder vermelden we de belangrijkste informatie in verband met uw deelname aan het interview. We vragen u vriendelijk om deze informatie aandachtig te lezen. Wanneer iets niet duidelijk is of als er nog andere vragen zijn, aarzel dan niet om de onderzoekster te contacteren (zie contactinformatie hieronder). Verder kan u contact opnemen indien u individuele feedback wenst over de resultaten van het onderzoek.

#### **Doel van de studie**

Het doel van deze studie is: 1) het in kaart brengen van de verschillende profielen en kenmerken van zelf-gerapporteerde medicinale cannabisgebruikers. 2) het bestuderen van de ervaringen van zelf-gerapporteerde cannabisgebruikers met het gebruik voor medicinale en recreatieve doeleinden. Deze studie is het eerste onafhankelijk academisch onderzoek dat alle facetten van het medicinale cannabisgebruik in Vlaanderen verkent. Op deze manier wil het bijdragen tot het academische en politieke discussie rond de regulering van medicinaal cannabisgebruik.

#### **Procedures**

Met de afname van dit interview willen we meer kennis vergaren over cannabisgebruik om gezondheidsredenen in Vlaanderen, vanuit het perspectief van de gebruiker. Het interview omvat vragen omtrent uw gezondheid, medische behandelingen, medische voorgeschiedenis, attitudes t.a.v. (niet-) conventionele medische praktijken en een aantal kenmerken en patronen van uw medicinaal en recreatief cannabisgebruik. Het face-to-face interview zal vermoedelijk 1 uur en 30 minuten van uw tijd in beslag nemen.

#### **Mogelijke voordelen aan een deelname**

Wanneer u toestemt om deel te nemen aan het interview, krijgt u de kans om uw ervaringen met en mening over cannabisgebruik om gezondheidsredenen te delen. Met uw deelname kan u helpen met het bevorderen van de wetenschappelijke kennis omtrent cannabisgebruik om gezondheidsredenen. Het kan tevens mogelijk bijdragen tot het informeren van beleidsmakers en de ruimere beleidsdiscussies rond de regulering van medicinale cannabis.

#### **Mogelijke risico's aan een deelname**

Het interview is anoniem. Er worden geen gegevens verzameld die kunnen leiden tot het onthullen van uw identiteit. Indien u toch per ongeluk gegevens zou verstrekken die tot herkenbaarheid kunnen leiden, zullen deze uit de gegevensbestanden worden verwijderd. De gegevens worden op een beveiligde locatie bewaard. Alle gesprekken tussen de respondent en de onderzoeker zijn strikt vertrouwelijk en worden gedekt door het beroepsgeheim (onder garant van dr. P. Vankrunkelsven). Hoewel de vragenlijst volledig anoniem is, kunnen zich eventueel wel enkele ongemakken voordoen:

- 1) er zullen vragen voorgelegd worden omtrent uw medische aandoeningen en/of voorgeschiedenis. Dit kan soms gevoelens van ongemak of bezorgdheid opwekken.
- 2) het beantwoorden van vragen over gebruik en het verkrijgen van cannabis kan soms aanleiding geven tot een gevoel van schuld en/of schaamte.

### **Rechten van de deelnemers**

U mag op eender welk moment en zonder gevolgen uw medewerking stopzetten. Door deel te nemen aan dit onderzoek doet u in geen geval afstand van uw juridische aanspraken, rechten of rechtsmiddelen. Indien u vragen hebt over uw rechten als onderzoekssubject kunt u contact opnemen met de Commissie Wetenschappelijke Integriteit (CWI), Sint-Pietersnieuwstraat 25, 9000 Gent of via e-mail naar [cwi@ugent.be](mailto:cwi@ugent.be)

### **Toestemming**

Door hieronder 'ik ga akkoord' aan te kruisen, ga ik ermee akkoord mijn medewerking te verlenen aan het onderzoek en ga ik akkoord met de volgende voorwaarden:

- (1) Ik heb voldoende informatie gekregen omtrent het doel van het onderzoek;
- (2) Ik begrijp de voordelen en risico's verbonden aan een deelname;
- (3) Ik heb elke vraag in verband met het onderzoek kunnen stellen;
- (4) Ik neem totaal uit vrije wil en op vrijwillige basis deel aan het onderzoek;
- (5) Ik geef de toestemming aan de onderzoeker om mijn resultaten op een vertrouwelijke en anonieme wijze te bewaren, te verwerken en te rapporteren;
- (6) Ik begrijp dat alle gegevens die ik in het kader van dit interview verstrek, geheel vertrouwelijk en anoniem zullen worden verwerkt en enkel in functie van onderzoek zullen worden gebruikt;
- (7) Ik ben op de hoogte van de mogelijkheid om mijn deelname aan het onderzoek op ieder moment stop te zetten en dit zonder opgave van reden;
- (8) ik ben ervan op de hoogte dat ik op aanvraag een samenvatting van de onderzoeksbevindingen kan krijgen;
- (9) ik ten minste 18 jaar oud ben;

Ik ga akkoord

### **Contactinformatie:**

Frédérique Bawin (onderzoekster)

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*Hartelijk dank voor uw medewerking!*

