The following individuals certify that they have read, and recommend to the Faculty of Graduate and Postdoctoral Studies for acceptance, the dissertation entitled:

Reasonable or unreasonable?: a patient-centred perspective of access to cannabis for medical purposes under different regulatory frameworks in Canada

submitted by N. Rielle Capler in partial fulfillment of the requirements for
the degree of Doctor of Philosophy
in Interdisciplinary Studies

Examinig Committee:
Jane Buxton, Population and Public Health, UBC
Co-supervisor
Lynda Balneaves, College of Nursing, University of Manitoba
Co-supervisor
Thomas Kerr, Department of Medicine, UBC
Supervisory Committee Member
Charles Grant, School of Social Work
University Examiner
Michael Law, School of Population and Public Health
University Examiner

Additional Supervisory Committee Members:
Mark Ware, Department of Family Medicine, McGill University
Supervisory Committee Member
ABSTRACT

Background: Since 2001, a medical cannabis program has existed in Canada with the goal of providing reasonable access to cannabis for medical purposes. However, reasonable access has not been defined, and few studies have investigated if reasonable access has been achieved and for whom since the implantation of the Marijuana for Medical Purposes Access Regulations (MMPR) in 2013. This dissertation sought to understand reasonable access to medical cannabis from a patient-centred perspective, including access to authorization and to sources of cannabis, during a transitionary period between regulatory frameworks.

Methods: In 2014, a national sample of medical cannabis users participated in a cross-sectional, mixed methods study. A total of 369 individuals completed an online survey and 33 participated in semi-structured interviews. Bivariate and multivariate analyses were used to establish associations between patient- and system-related factors and access to authorization and sources of cannabis, and to compare satisfaction ratings between legal and illegal sources. An interpretive descriptive analysis was conducted to explore consequences of access. The Levesque patient-centred healthcare access model informed all phases of the study.

Results: Few significant sociodemographic factors and medical conditions were associated with authorization status; however, associations were found regarding patterns of cannabis use. Authorized participants also experienced more problems accessing cannabis than unauthorized participants. Of legally authorized participants, half accessed illegal sources; those using only legal sources compared to those using illegal sources differed regarding the characteristics of products and services they considered important. Highest satisfaction levels were reported for sources closest to production and those providing in-person service. Participants experienced considerable health, legal, financial and social consequences from their access experiences.

Conclusions: Reasonable access to medical cannabis was not achieved for many participants in this study. Patterns of use and perceived quality of products and services may have influenced both access to the program and to sources at different
stages of access, resulting for some in the use of medical cannabis outside the legal framework. Patient-centred research on access to medical cannabis is necessary to establish whether reasonable access has been achieved, and future research must assess the impact of legalized recreational cannabis on access.
LAY SUMMARY

This dissertation explored access to medical cannabis in Canada during a transition between regulatory frameworks in 2014. The study used survey data collected from 369 medical cannabis users from across Canada, and 33 in-depth interviews. The study findings suggest that barriers to access existed at the time of the study, both in terms of access to the program and access to legal sources, leading to serious health, legal, financial and social consequences for many patients. This dissertation expands our understanding of reasonable access to medical cannabis from a patient-centred perspective and makes recommendations to promote its achievement. It also provides a foundation for future evaluations of the extent to which reasonable access has been achieved under the current and emerging medical cannabis regulations, and to assess the impact of the upcoming legalization of cannabis for recreational purposes on individuals’ access to cannabis for medical purposes in Canada.
PREFACE

This statement certifies that all the work presented henceforth was conceived, undertaken, and written by the author, N. Rielle Capler (RC). All data used in this study were derived from the Cannabis Access Regulations Study (CANARY). Ethics approval for CANARY was obtained from the Behavioural Review Ethics Board at the University of British Columbia in Vancouver, Canada (certificate # H13-03370). Dr. Lynda Balneaves (LB) was PI on CANARY, and RC was Co-I, along with Drs. Jane Buxton (JB), Thomas Kerr (TK), and Zachary Walsh. As coordinator of CANARY, RC developed the research survey, interview guide, and recruitment strategy, and engaged in data collection in collaboration with the PI, Co-Is, knowledge users (Drs. Brian Emerson, Kenneth Tupper, Lynne Belle-Isle, Mark Ware (MW), and community partners (Action Atlantic, The Arthritis Society, British Columbia Cancer Agency, Canadian AIDS Society, Canadian Association of Medical Cannabis Dispensaries, Canadian Cancer Society, Canadian Medical Association, Canadian Pain Coalition, Chronic Pain Association of Canada).

All chapters in this dissertation are original unpublished intellectual products of RC. With substantive guidance and input from co-supervisors LB and JB, and supervisory committee members TK and MW, RC searched and reviewed all the literature presented, designed the research, developed the analysis plan in consultation with supervisory committee and statisticians from the BC Center for Excellence in HIV/AIDS, and synthesized the findings in all the chapters. Statisticians were hired for the analysis of the data in Chapters 3 and 4, and RC conducted the analysis for Chapter 5 with coding support from research assistants.
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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AIC</td>
<td>Akaike Information Criterion</td>
</tr>
<tr>
<td>ACMPR</td>
<td>Access to Cannabis for Medical Purposes Regulations</td>
</tr>
<tr>
<td>CANARY</td>
<td>Cannabis Access Regulations Study</td>
</tr>
<tr>
<td>CDSA</td>
<td>Controlled Drugs and Substances Act</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>Human immunodeficiency virus infection and acquired immune deficiency syndrome</td>
</tr>
<tr>
<td>LP</td>
<td>Licensed producer</td>
</tr>
<tr>
<td>MMAR</td>
<td>Marihuana Medical Access Regulation</td>
</tr>
<tr>
<td>MMAP</td>
<td>Marihuana Medical Access Program</td>
</tr>
<tr>
<td>MMPR</td>
<td>Marihuana for Medical Purposes Regulations</td>
</tr>
<tr>
<td>No HC</td>
<td>Not registered in Health Canada’s medical cannabis program</td>
</tr>
<tr>
<td>PTSD</td>
<td>Post-traumatic stress disorder</td>
</tr>
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</table>
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My inspiration to embark on this academic endeavour, and the perseverance to complete it, came from the strength and dignity of the medical patients I have had the honour to know; the determination and compassion of the advocates pursuing patients’ rights to health and liberty; the vision and spirit of my colleagues working in all aspects of the cannabis field; and the dedication and tenacity of cannabis researchers shining light into prohibited corners. In particular, I want to acknowledge Liaping Ling for being my statistical guru, Erin Waters for being my NVivo ninja, Drs. M-J Milloy and Jonathan Page for their support and encouragement, Drs. Ethan Russo and Lester Grinspoon for being my cannabis professors at large, and the late Senator Pierre Claude Nolin for imparting his faith in the democratic process and the value of striving.

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I express my heartfelt gratitude to my friends and family for their moral and material support, emotional and physical care, and their patience and playfulness on this long strange trip.
DEDICATION

To all medical cannabis patients,

Tikkun Olam
CHAPTER 1: INTRODUCTION

1.1 Access to cannabis for medical purposes in Canada

The right to health is enshrined in international laws and treaties, including the World Health Organization’s Constitution, and the United Nation’s International Covenant on Economic, Social and Cultural Rights, which declares that “the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition” (United Nations, 1966; World Health Organization, 1946). In Canada, courts have upheld the right to health through interpretations of Section 7 of the Canadian Charter of Rights and Freedoms, which guarantees that “everyone has the right to life, liberty, and security of the person, and the right not to be deprived thereof except in accordance with the principles of fundamental justice” (Canadian Charter, 1982). Access to health care is a major objective of Canadian health policy due to its impact on individual and community health. The Canada Health Act states that the primary objective of our health care policy is "to protect, promote and restore the physical and mental well-being of residents of Canada and to facilitate reasonable access to health services without financial or other barriers" (Canada Health Act, 1984). Accessibility is one of the five core principles of the Canadian Health Act, further highlighting the importance of the concept of access in Canadian health care policy.

There is a growing body of evidence documenting the potential effectiveness of cannabis in treating many chronic diseases and end-of-life issues that may not be well addressed by conventional medical treatments. Medical conditions for which cannabis has been demonstrated to have therapeutic potential pain chemotherapy-
induced nausea and vomiting, and spasticity associated with multiple sclerosis (Abrams, 2018; Aggarwal et al., 2009; Ben Amar, 2006; Hill, 2015; Lynch & Campbell, 2011; National Academies of Sciences, Engineering, 2017; Ware et al., 2015; Whiting et al., 2015). Cannabis is the most prevalently used illegal drug worldwide, with approximately 23% of the adult population in Europe having used it at some point in their lives (European Monitoring Centre for Drugs and Drug Addiction, 2017), and a 45% lifetime use in Canada (Government of Canada, 2017b). The use of cannabis for medical purposes is also substantial; it is estimated that approximately 2-4% of Canadians over the age 15, or 24-28% of cannabis users (~600,000 – 1,000,000) have used cannabis for medical purposes in the past 12 months (Adlaf, Begin, & Sawka, 2005; Government of Canada, 2017b; Stockwell, Sturge, Jones, Fischer, & Carter, 2006). Studies examining cannabis use within specific medical condition populations have reported as many as 40% of people living with HIV/AIDS, 21% of people with epilepsy, 16% of people with multiple sclerosis, and 15% of people with chronic pain use cannabis to help manage their symptoms (Belle-Isle & Hathaway, 2007; Clark et al., 2004; Degenhardt et al., 2015; Lake et al., 2017; Lynch, Young, & Clark, 2006; Ware, Doyle, Woods, Lynch, & Clark, 2003; Ware, Rueda, Singer, & Kilby, 2003).

The number of people using cannabis for medical purposes has the potential to grow substantially due to an aging population and the increasing prevalence of chronic illnesses for which cannabis may have a therapeutic role, making the issue of patient access to cannabis increasingly salient. However, cannabis has historically been designated as a Schedule 2 substance in the federal Controlled Drug and Substances Act (CDSA), which prohibits its possession, production or distribution (Controlled Drugs and Substances Act, 1996), complicating the issue of access to cannabis for
medical purposes. As the body of evidence related to the therapeutic potential of cannabis has increased, and patients have successfully challenged criminal charges related to their medical use of cannabis in the courts, constitutional rights in Canada have been extended to include the right to reasonable access to cannabis for medical purposes (R. v. Parker, 2000; R. v. Wakeford, 1998). In 2001, Canada became the second country in the world after the Netherlands to establish a federal program for the production and distribution of cannabis for medical purposes, providing patients with legal authorization to possess cannabis and establishing legal sources of supply. In line with the objectives of the Canada Health Act, a central goal of Canada’s federal medical cannabis program has been to provide reasonable access. However, reasonable access is not defined in either the Canada Health Act, or in legislation permitting access to cannabis for medical purposes, leaving it unclear how to best determine if access, reasonable or otherwise, has been achieved through the federal program.

1.2 Study setting and context

Cannabis became a controlled substance in Canada in 1923 and is designated as a Schedule 2 substance in the federal CDSA, which prohibits its possession, production or distribution (Controlled Drugs and Substances Act, 1996). Despite its illegal status and associated criminal consequences, cannabis is the most commonly used illegal drug internationally, as well as in Canada (Canadian Centre on Substance Abuse, 2016; EMCDDA, 2017). Since cannabis is regulated as a controlled substance in Canada, special provisions were required to authorize legal access to individuals in medical need. In 1999, as a result of a court ruling (R. v. Wakeford, 1998), Health Canada established the Marihuana Medical Access Program (MMAP) and allowed
patients to apply for a ministerial exemption to the CDSA in order to use or produce cannabis for medical purposes. A 2000 court ruling deemed this ministerial exemption to be inadequate since it gave unfettered discretionary power to the Minister of Health, which could unduly delay or impair access; the ruling also declared sections of the CDSA that prohibited the possession and production of cannabis unconstitutional because it forced people to choose between their liberty and their health (R. v. Parker, 2000). In response, Canada’s federal department of health, Health Canada, initiated a succession of regulations intended to provide reasonable access to cannabis for medical purposes, starting with the Marihuana Medical Access Regulations (MMAR), which came into effect in 2001 (See Figure 1.1).

The MMAR set out a process to authorize patients with a demonstrated medical need to legally possess and obtain a supply of cannabis. The MMAR established two categories of applicants: Category 1 required a physician’s signature on a medical declaration in support of applications from patients suffering from symptoms related to end of life care, cancer, HIV/AIDS, spinal cord injury, epilepsy and arthritis; and Category 2, which required an additional assessment by a medical specialist for those suffering from symptoms related to other medical conditions for which conventional treatments had been deemed inappropriate. In terms of providing access to a legal supply of cannabis, the government-administered program initially issued licenses for patients to personally produce or designate someone else to produce their supply of cannabis. A year after the implementation of the MMAR, the Senate Special Committee on Illegal Drugs declared that the regulations themselves were a barrier to access:
While a process that authorizes the possession and production of marijuana has been established in Canada, this has not ensured that cannabis is suitably available to those in need…we have come to the conclusion that the MMAR have become a barrier to access. Rather than providing a compassionate framework, the regulations unduly restrict the availability of cannabis to those who may receive health benefits from its use (Senate of Canada, 2002).

The courts reached a similar conclusion, finding the MMAR merely provided “an illusion of access” and deemed the legal supply options to be inadequate (Hitzig v. Canada, 2003). The ruling recognized the existence of medical cannabis dispensaries, also known as compassion clubs, which were illegally providing cannabis to thousands of patients across the county, and suggested that Health Canada license these establishments. Instead, Health Canada elected to contract one private company (Prairie Plant Systems), to produce cannabis and become an additional legal supply source for those authorized under the MMAR (Government of Canada, 2003). Several subsequent court challenges arose due to the obstacles patients experienced in accessing authorization to possess cannabis, as well as concerns about the adequacy of the legal supply options, leading to several judicial declarations that the MMAR prevented effective access to cannabis for medical purposes, and therefore, violated Section 7 of the Canadian Charter of Rights and Freedoms (R. v. Beren, 2009; R. v. Mernagh, 2011; R. v. Smith, 2012; Sfetkopoulos v. Canada, 2008). These court decisions resulted in Health Canada making minor amendments to the MMAR to lessen restrictions on cultivation and facilitate access to cannabis for medical purposes. Health Canada authorized 35,000 patients to possess cannabis under the MMAR (Ramsay, 2014).
In June 2013, after an internal review and consultations with stakeholders, the Government of Canada published the *Marihuana for Medical Purposes Regulations* (MMPR) (Government of Canada, 2013). The MMPR, enacted on October 1, 2013, were meant to replace the MMAR, overlapping with those regulations until their repeal on March 31, 2014. The objective of the MMPR was to “reduce the risks to public health, security and safety of Canadians, while significantly improving the way in which individuals access marihuana for medical purposes” (Government of Canada, 2012). The MMPR included fundamental changes to the authorization process and the legal sources of cannabis in Canada. Under the MMPR, Health Canada no longer played a central role in the authorization of individual patients to possess cannabis for medical purposes; instead, healthcare practitioners, including physicians and nurse practitioners, were solely responsible for authorizing access to cannabis. The application process was streamlined and did not delineate a category requiring medical specialist support. In addition, Health Canada’s contracted supplier, as well as personal and designated production, were to be replaced by commercial licensed producers (LPs), which were intended to become the only legal source of cannabis for authorized patients in Canada. To access cannabis, patients were required to submit a medical document they received from their healthcare practitioner directly to an LP of their choice. The patient could then place an online order with the LP, which was then responsible for delivering cannabis to the patient by bonded courier. The MMPR also reduced the maximum amount of cannabis a patient was permitted to possess from 30 times the daily quantity authorized by a healthcare provider, to 150 grams. Products available under the MMPR were limited to dried cannabis, as they were under the MMAR.
Starting on October 1, 2013, Health Canada no longer accepted new applications for licenses under the MMAR, including those for authorization to possess cannabis and for personal or designated production. New patients were required to register with an LP under the MMPR. Patients still authorized under the MMAR without an existing production license could choose to obtain cannabis from Health Canada’s contracted supplier, or they could register with an LP under the MMPR. Renewals of existing MMAR production licenses continued until March 31, 2014, however, Health Canada placed a moratorium on any changes to these licenses with respect to location or number of plants. On March 31, 2014, all authorizations to possess and produce cannabis under the MMAR were scheduled to expire; patients and their designated producers were instructed to cease production and destroy any remaining supply. Health Canada’s supply also ceased to be available through their contracted supplier. All individuals authorized to access cannabis for medical purposes were thenceforth required to obtain it from an LP. However, on March 21, 2014, citing “irreparable harm” to patients who would be unable to afford cannabis supplied under the MMPR, a federal court granted an interim injunction allowing individuals who were previously authorized under the MMAR to continue to produce cannabis until a constitutional challenge to the MMPR could be heard (Allard et al. v. Canada, 2014). This case challenged the constitutionality of the MMPR for prohibiting production, possessing more than 150 grams and consuming forms other than dried cannabis. The injunction applied to those who held a valid Authorization to Possess license as of March 21, 2014 and a corresponding license to produce or designated production license that was valid on or after Sept 30, 2013. It is not clear how many of the ~28,000 patients who had been issued personal or designated production licenses under the MMAR (Stambrook, Ireland, & Xie, 2012) met the
injunction’s criteria, nor how many of them were aware of the injunction in a timely manner prior to dismantling their production operation and destroying their supply of cannabis. In April 2014, 5,100 patients were registered with an LP under the MMPR.

In June 2015, in an appeal of a court case initially heard in 2012 in the British Columbia Supreme Court (R. v. Smith, 2012), the Supreme Court of Canada ruled that restricting cannabis under the MMAR to only dried cannabis was too restrictive and violated the Charter (R. v. Smith, 2015). In February 2016, the federal court ruled the MMPR to be unconstitutional for not providing reasonable access to cannabis to those in medical need (Allard et al. v. Canada, 2016). The federal government responded with the Access to Cannabis for Medical Purposes Regulations (ACMPR), which came into force August 24, 2016, replacing both the MMAR and MMPR and reintroducing personal and designated production options alongside LPs as legal sources of cannabis for medical purposes, as well as permitting the provision of cannabis oils and fresh cannabis, in addition to dried cannabis (Government of Canada, 2016).

Regarding the supply of cannabis, Health Canada began accepting applications from parties interested in becoming an LP under the MMPR in June 2013. The first licenses were issued in September 2013 to the previously contracted supplier under the MMAR for production, and to their subsidiary (CanniMed) for distribution to patients (CanniMed, 2013a). CanniMed announced their first shipment to a patient in November 2013 (CanniMed, 2013b). As of April 1, 2014, Health Canada’s website listed 12 LPs, 4 of which had product available for sale to patients. As of April 30, 2014, 13 LPs were listed on the website, with 8 of those selling to patients. By January 2015, Health Canada had licensed 23 LPs; 15 of those companies were permitted to sell their products to patients (Freeman, 2015). The issuing of licenses continued at a
slow pace, and as of July 2017, 52 licenses had been issued to cannabis producers under the ACMPR (Health Canada 2017a). In April 2017, the government of Canada tabled Bill C-45 to legalize and regulate cannabis for recreational purposes, and suggested they would maintain a separate medical program, with LPs supplying the recreational market as well as the medical market (House of Commons of Canada, 2017a; Task Force on Cannabis Legalization and Regulation, 2016). Since that announcement, the licensing of LPs increased rapidly; by March 2018, 97 licenses had been issued, 42 of which were licensed to sell to registered patients (Health Canada, 2018a). As of December 2017, ~269,000 patients were registered with one of Canada’s LPs under the ACMPR (Health Canada, 2017b). Additionally, 12,957 personal production licenses and 872 designated producer licenses were actively registered by this date (Health Canada, 2018c).

1.3 Study justification

As cannabis legislation is changing in Canada and internationally for both medical and recreational purposes, access for therapeutic use remains a critical issue. As one of the first countries to implement a national program for access to cannabis for medical purposes, Canada’s experience with the impact of the amendments to its regulations on access is instructive for other international jurisdictions establishing health services and policies specific to cannabis for medical purposes. Monitoring the impacts of these amendments is also necessary to inform future amendments to these regulations, and to establish a baseline before legalization of cannabis for recreational purposes occurs in Canada. Health Canada’s Performance Measurement and Evaluation Plan to assess implementation activities and outputs for the MMPR did not include patient-centred outcomes, such as barriers to access and satisfaction, and failed to
account for the numerous eligible individuals who were unable to access authorization, or preferred to use illegal sources because of various constraints (Health Canada, 2012). Based on previous experiences with the MMAR and MMPR, including successive court findings that the constitutional rights of patients were being violated, the definition of reasonable access, and its assessment, would benefit from a patient-centred approach that focuses on users’ perspectives and experiences, including disparities that may impact equity of access. Furthermore, Health Canada’s evaluation plan for the MMPR did not account for the first several years of the program. This early stage is a pivotal time to measure the impact of health policy change, providing an assessment during a unique period in time in which patient access to cannabis for medical purposes may be impacted, positively or negatively, affecting the health and wellbeing of patients. This time period also sets a precedent that may impact patients’ future decisions to engage with the legal system.

Since the implementation of the MMPR, there have been no nation-wide investigations into whether the goal of reasonable access to cannabis for medical purposes has been achieved, and for which individuals, from a patient-centered perspective. Previous research has indicated that patients experienced various obstacles to access under the MMAR, including obtaining the necessary documentation from a physician, problems with the legal cannabis supply options, and the high cost associated with access (Belle-Isle et al., 2014; Belle-Isle & Hathaway, 2007; Bottorff et al., 2013). A national survey of Canadians using cannabis for medical purposes revealed few differences between MMAR authorized and unauthorized patients in relation to their disease status, severity of symptoms, and patterns of cannabis use, suggesting the MMAR left many qualified patients without legal
authorization and using illegal sources (Walsh et al., 2013), putting them at risk of legal sanction and possible stigma related to participating in criminal activity or recreational use (Bottorff et al., 2013). It is uncertain what the implications are of creating a decentralized, competitive national market for cannabis for medical purposes through the licensing of commercial producers, and whether the previously identified barriers to access persisted under the MMPR.

A patient-centered evaluation of access to cannabis for medical purposes at the early stages of the MMPR has the potential to address the limitations of Health Canada’s Performance Measurement and Evaluation Plan and provide valuable data to help healthcare professionals and policy makers understand who is and who is not able (or not choosing) to access the legal system of cannabis for medical purposes, and why. This research aims to support the goal of providing “reasonable access” to both authorization and a legal supply of cannabis under the current ACMPR and future regulatory frameworks that may be implemented alongside the regulation of cannabis for recreational purposes. It will also have the potential to provide valuable data that will assist healthcare professionals, policy makers and medical cannabis providers to be responsive to the needs of patients who are using cannabis to manage their health conditions.

1.4 Conceptual framework

This study draws on Levesque et al.’s patient-centered conceptual framework of access to health care (the Levesque model) (Levesque, Harris, & Russell, 2013), as shown in Figure 1.2. Here, access is defined as the opportunity to have healthcare needs fulfilled, and is achieved through a linear process impacted by factors related to the patient (i.e., patient abilities) interacting with factors related to the healthcare
Building on previous models of access to health care (Andersen, 1995; Gulliford et al., 2002; McIntyre, Thiede, & Birch, 2009; Penchansky & Thomas, 1981; Ricketts & Goldsmith, 2005), the Levesque model delineates five dimensions of accessibility (i.e., approachability, acceptability, availability and accommodation, affordability, and appropriateness) and five corresponding patient abilities (i.e., ability to perceive, ability to seek, ability to reach, ability to pay, and ability to engage). Although conceptualized as linear, it is also understood that the dimensions of access are inter-related, can come into play at different times, and may influence each other. At the centre of this model is the process of access, wherein the patient moves through six stages: having health care needs, having the perception of needs and desire for care, engaging in health care seeking behaviours, reaching health care, utilization of health care, and finally, experiencing consequences of health care. Health care consequences in this model include economic, health and satisfaction outcomes.

The Levesque model embeds both facilitators and barriers to access, and postulates that although patients have rights to health care in theory, and while services may exist in reality, access may be restricted at any step in the process of achieving access. For example, regarding the dimension of ‘appropriateness’, Levesque et al. suggest that access should encompass the possibility to choose acceptable and effective services, while the opportunity to utilize only services of poor quality is a restriction to access (Levesque et al., 2013). This framework has the ability to capture key barriers and facilitators to accessing cannabis for medical purposes, which patients have identified in previous research under the MMAR, and to anticipate issues arising under the MMPR and ACMPR. For example, research has
demonstrated that there was little difference in medical conditions and reasons for use (i.e., health care needs) between those who were accessing cannabis through the MMAR and those using cannabis for medical purposes outside the legal program (Walsh et al., 2013). This data suggests that barriers to access existed at other stages of access. The patient abilities and health care dimensions in this framework may help identify and locate the barriers to accessing the legal program or legal sources of cannabis, allowing for targeted interventions. For example, obtaining the documentation required from a healthcare practitioner to access the legal program depends in part on the views of the practitioner about cannabis use for medical purposes (i.e., acceptability). Furthermore, the shift to a commercial system of LPs was anticipated to have a significant impact on prices (i.e., affordability) and patients’ ability to pay, which would ultimately affect the utilization stage of access for sources, even if individuals were able to gain access to the MMPR (Stambrook et al., 2012). Additionally, while some patients may have been able to gain authorization to the MMAR or MMPR, the legal sources available to them may not have provided the services or products they needed (i.e., appropriateness), impacting the consequences stage of access. Likewise, if the legal sources did not provide affordable cannabis or the preferred forms of cannabis, individuals may not have desired authorization under the legal program, impacting access at the perception of need and desire for care stage of access.

In addition, the Levesque model reflects the concept of equity, and can be used to look at the experiences of different social groups in accessing health care according to each stage of access and the influencing dimensions of accessibility and abilities of patients. This model also acknowledges the larger context in which these health care interactions occur, accounting for social, political, and structural factors that influence
health care access, filtered through patient and system factors. In the current study, the Levesque model informed the selection and development of the quantitative outcome measures used to assess and examine access to cannabis for medical purposes from a patient-centered perspective. It also informed the qualitative approach used to explore the interface of patient abilities and access dimensions, allowing for in-depth understanding of patients’ perceptions about access, as well as their experiences utilizing cannabis legally and illegally, and the related consequences of access. This model helped generate empirical evidence to shed light on whether reasonable access to authorization and to a legal supply of cannabis for medical purposes had been achieved, and for whom, in Canada.

1.5 Study aim and objectives

It was determined by the courts that access to cannabis for medical purposes was a constitution right in Canada due to its potential medical benefit. This study did not seek to evaluate the effectiveness of cannabis for medical purposes, rather it sought to evaluate patients’ experiences with access to cannabis under different regulatory frameworks and outside the legal framework in Canada. Building on the previous research about medical cannabis access, reviewed in Chapter 2, the primary aim of this dissertation is to examine patient- and system-related factors and patient experiences associated with accessing cannabis for medical purposes in Canada under the MMAR and MMPR.

Analyses involved assessing the relationship between patients’ authorization status (i.e., authorized under the MMAR, MMPR or not authorized under either legal program) and patient characteristics, patterns of cannabis use, as well as problems
experienced with gaining access to both authorization and to cannabis sources. As well, in an effort to understand authorized patient’s use of legal and illegal sources of cannabis, additional analyses seek to assess patient- and system-related factors associated with cannabis source status (i.e., accessing cannabis for medical purposes from legal and illegal sources) and perceptions of the quality of cannabis products and services among authorized users. In addition, this research explores experiences of patients in accessing cannabis for medical purposes in Canada to further elucidate the barriers and facilitators to reasonable access, and the implications of different regulations on the consequences of access. Specifically, the research focuses on the following objectives:

1. To identify factors associated with legal authorization status for adults who use cannabis for medical purposes in Canada (Chapter 3). To identify factors associated with authorization status, including MMAR, MMPR and those not authorized under either of these regulations, the relationship between authorization status with sociodemographic factors (e.g., age, gender, ethnicity, residence, income, employment and education), health-related factors (e.g., medical conditions and symptoms for which cannabis was being used) and patterns of use factors (e.g., quantity of cannabis used per day and mode of using cannabis) was investigated through a national, online survey. The problems experienced by participants with different authorization status in obtaining both authorization and cannabis were also explored. Informed by the Levesque model (Figure 1.2) and previous studies exploring barriers to access to medical cannabis (Belle-Isle et al., 2014; Belle-Isle & Hathaway, 2007; Bottorff et al., 2013; Bottorff, Bissell, et al., 2011; Capler, Walsh, et al., 2017; Lucas, 2012; Reiman, 2007; Reinarman, Nunberg, Lanthier, & Heddleston,
2011; Walsh et al., 2013), it was hypothesized that these factors were potentially associated with authorization status.

2. To identify factors associated with accessing cannabis for medical purposes from legal and illegal sources and perception of quality among adults authorized to use cannabis for medical purposes in Canada (Chapter 4). Previous research has shown that the majority of patients authorized under the MMAR were accessing both legal and illegal sources of cannabis (Belle-Isle et al., 2014; Capler, Walsh, et al., 2017). To gain an understanding of why those who have access to legal sources may still choose to access illegal sources, the factors associated with access from illegal and legal sources of cannabis were investigated through a national, online survey. Based on existing literature and the Levesque model (Figure 1.2), this investigation examined potential associations between cannabis sources and sociodemographic factors (e.g., age, gender, ethnicity, residence, income, employment and education) and health-related factors (e.g., medical conditions and reasons for using medical cannabis). Characteristics of cannabis products and services deemed important by users accessing cannabis from legal and illegal sources were explored, as were differences in perceived quality of cannabis products and services from these sources among study participants with MMAR and MMPR authorization status. Quality indicators examined included the following dimensions of products and services: quality of cannabis products, quality of care and services, expertise and support; administration and accessibility; affordability; and overall satisfaction.

3. To explore the consequences experienced by adults accessing cannabis for
Guided by findings from previous research and the Levesque model (Figure 1.2), qualitative data was collected through semi-structured interviews to explore participants’ experiences of the health, legal, financial and social consequences of access to cannabis for medical purposes. Principles and techniques of interpretive description methodology were used, including an interplay between analysis, interpretation and meaning construction (Thorne, Reimer Kirkham, & O’Flynn-Magee, 2004). This analysis allowed us to give voice to patients’ experiences, and gain a deeper understanding of the impact of accessing cannabis for medical purposes within and outside of the regulatory framework. Additionally, this analysis informs the meaning of “reasonable access” and a determination of whether it had been achieved during the transition period from the MMAR to MMPR.

1.6 Study design

1.6.1 Cannabis Access Regulations Study (CANARY)

The research presented herein is derived from an analysis of data obtained via an online survey and semi-structured interviews undertaken through the Cannabis Access Regulations Study (CANARY). Launched in 2014, the CANARY study was a cross-sectional, mixed methods study aimed at capturing the anticipated shift in medical cannabis regulations in Canada from the MMAR to the MMPR in April 2014, which did not occur as anticipated due to a court injunction (Allard et al. v. Canada, 2014). The data utilized in this study was collected approximately 6-9 months post-introduction of the MMPR; the survey data was collected from March to May 2014,
and the interviews were conducted between May and July 2014. This timeframe reflects the early stages of regulatory change; the MMAR and MMPR overlapped from Oct 1, 2013 to April 1, 2014, and the subsequent court injunction prolonged access to the MMAR’s legal sources, including personal and designated cannabis production, beyond April 1, 2014. Both quantitative and qualitative data were collected to support an evaluation of health policy and services at both a patient and system level. The rich qualitative interview data augmented the survey data by giving voice to patients’ experiences.

A total sample of 369 patients were recruited for the online survey, comprised of 3 sub-groups: 1) MMPR Sub-Group – patients who were authorized to use cannabis under the MMPR (n=59); 2) MMAR Sub-Group – patients who were authorized to use cannabis under extended MMAR authorizations (n=178); 3) No Health Canada Program Sub-Group – patients who used cannabis for medical purposes but were not authorized under a Health Canada program (n=132). These subgroups allowed for comparisons of experiences with access to authorization and cannabis sources under the two regulatory frameworks for legal access to medical cannabis, and of medical cannabis users who did and did not participate in Health Canada’s program. An assumption of this study was those in the No HC group were accurately defining their cannabis use as medical. Given that the MMPR had been recently implemented, and a smaller number of patients were enrolled, it was more difficult to recruit this group than the others.

The survey and interview questions were developed in consultation with knowledge users and research partners, including Action Atlantic, The Arthritis Society, British Columbia Cancer Agency (BCCA), British Columbia Ministry of Health, Canadian AIDS Society, Canadian Association of Medical Cannabis
Dispensaries, Canadian Cancer Society, Canadian Consortium for the Investigation of Cannabinoids (CCIC), Canadian Medical Association (CMA), Canadian Pain Coalition, Chronic Pain Association of Canada and was informed by the Levesque model (Figure 1.2) and previous literature. Where possible, the surveys utilized items and scales used in previous research on access to cannabis for medical purposes as well as validated and reliable instruments. A pilot test of the surveys was conducted with three patients identified through patient advocacy groups, as well as with research team members.

1.6.2 Quantitative data collection

To facilitate enrolment of a sample representative of medical cannabis users with regard to diversity of socio-demographic characteristics and medical conditions, a variety of recruitment strategies that have been successfully implemented in previous research were used, including: a) sending a letter of invitation via patient email lists held by study partners; b) posting advertisements about the study in advocacy group newsletters, websites and other social media; c) distributing letters of invitations/advertisements through LPs and community-based dispensaries from across Canada. Health Canada declined to participate in the study, providing the rationale that engaging in research was “beyond the mandate” of the MMAP (personal communication). Although this was a convenience sample, concerted effort was employed to obtain representativeness in the sample with respect to geographical location and language (i.e., French) with support from study partners.

All interested individuals were directed to a bilingual study website (www.canarystudy.ca), which provided information about the purpose of the research, what participation entailed, and eligibility criteria. Potential participants
were then directed to an online survey, which asked for their email address to ensure the survey was only filled out once by each participant. Potential participants were also asked about their eligibility and those that did not meet the study criteria were unable to continue to the survey. Eligibility criteria included living in Canada, being at least 19 years of age, and able to speak and read English or French. To allow for a diverse sample and to enhance generalizability of the results, eligibility criteria included a range of medical conditions, including HIV/AIDS, cancer, arthritis, chronic pain, and other medical conditions. HIV/AIDS, cancer and arthritis were Category 1 conditions in the MMAR, and pain is one of the most frequently cited reasons for the use of cannabis for medical purposes (Government of Canada, 2001; Sexton, Cuttler, Finnell, & Mischley, 2016; Walsh et al., 2013; Ware et al., 2015). The eligibility criteria did not include current or past use of cannabis for medical purposes, however, for the purposes of the quantitative portion of this research, only those who reported use of cannabis for medical purposes in the last 30 days were included. To be eligible for participation in the online survey, individuals also needed access to a computer and the Internet. Those that met the study criteria were taken to an online consent form and, if they consented, they were taken to the online survey. The consent form included information about study participation, including the possibility of being invited to take part in qualitative telephone interviews if willingness was indicated. The surveys took approximately 30-45 minutes to complete. A follow-up survey was conducted; however, the responses were not used in this data analysis due to low participation rates, particularly for MMPR authorized participants. Participants were entered into 4 draws for $50 for completing both the baseline and follow-up survey.
1.6.3 Qualitative data collection

Based on previous research (Bottorff et al., 2013; Bottorff et al., 2011), it was anticipated that a sample of 30 individuals would provide the opportunity to explore a sufficient range of patient experiences and to uncover common patterns and themes. In total, a subset of 33 participants who had indicated a willingness to be contacted to participate in the qualitative interviews agreed to engage in semi-structured, telephone interviews.

Purposive sampling was utilized to ensure participants from each subgroup (MMPR, MMAR and No Health Canada Program) were included and to obtain similar participant diversity with respect to sociodemographic characteristics and medical conditions as those included in the survey. Those who had not used cannabis for medical purposes ever or in the last 30 days were included in the qualitative portion of this research to provide a wider breadth of perspectives. Interviews were conducted by telephone and took approximately one hour. A bilingual research assistant conducted interviews for participants who identified French as their first language. Each interview was audio-recorded, transcribed verbatim, and French interviews were translated into English. A separate draw for $50 was conducted for those completing qualitative interviews. A more detailed description of the qualitative research methods used in this dissertation is noted in Section 5.2.

1.7 Summary

This dissertation consists of six chapters. Chapter 2 is a review of the literature focused on access to cannabis for medical purposes. Drawing on the Levesque model, that chapter highlights patient- and system-related factors that may be associated with
access to both authorization and sources of cannabis for medical purposes. Chapters 3 and 4 summarize the quantitative analysis of survey responses, focusing on factors associated with legal authorization status (Chapter 3) and with accessing legal and illegal sources of cannabis (Chapter 4). Chapter 5 explores the qualitative data that augments the survey data obtained and gives voice to patients’ experiences related to accessing cannabis for medical purposes, focusing on the consequences of access. Chapter 6 synthesizes key study findings and discusses the implications for reasonable access to cannabis for medical purposes, as well as presents limitations, recommendations and directions for future research.
Figure 1.1 Timeline of Canadian medical cannabis regulation
Figure 1.2 Levesque et al.’s (2013) patient-centred conceptual framework of access to health care
CHAPTER 2: LITERATURE REVIEW – PATIENT AND SYSTEM FACTORS RELATED TO ACCESS TO CANNABIS FOR MEDICAL PURPOSES

2.1 Introduction

As described in Section 1.1, the use of cannabis for medical purposes is substantial in Canada and other international jurisdictions. It is estimated that approximately 2-4% of the Canadian population over the age 15, or 24-28% of cannabis users (~600,000 - 1,000,000) have used cannabis for medical purposes in the past 12 months (Adlaf et al., 2005; Government of Canada, 2017b; Stockwell et al., 2006). The rate of medical cannabis use is similar in California, where 2-3% of adults report current use of cannabis in the context of illness (California NORML, 2014). It is estimated that 5% of the adult population (or 1.4 million) have ever used cannabis for medical purposes in California; there are higher rates of lifetime medical cannabis use reported in Colorado and Washington (~8-9%) (Pacula, Jacobson, & Maksabedian, 2016; Ryan-Ibarra, Induni, & Ewing, 2015).

As a growing body of research attests to the therapeutic potential of cannabis for diverse medical conditions and symptoms (National Academies of Sciences, Engineering, 2017), numerous jurisdictions have carved out a legal space for its medical use within the broader framework of legal prohibition, including Canada, the Netherlands, Germany, Israel, Argentina, and 29 states and the District Columbia in the USA (Government of Canada, 2016; Klieger et al., 2017; Sznitman & Zolotov, 2015). As described in Section 1.2, Canada’s regulatory framework, starting with the Marihuana Medical Access Regulations (MMAR) in 2001, followed by the Marihuana for Medical Purposes Regulations (MMPR) in 2013 and the Access to Cannabis for Medical
Purposes Regulation (ACMPR) in 2016 (see Figure 1.1), was meant to provide reasonable access to cannabis for medical purposes, and has allowed eligible patients to legally possess cannabis and acquire it from a legal source. However, patients have reported barriers to both obtaining authorization and accessing a legal source under the MMAR (Belle-Isle et al., 2014; Belle-Isle & Hathaway, 2007; Canadians for Safe Access, 2005; Lucas, 2008). The most common barriers indicated by patients were difficulties obtaining the documentation necessary for authorization from a physician, problems with the cannabis supply options, and the high cost associated with access. Health Canada’s evaluation plan for the MMPR did not include such patient-centred outcomes (Health Canada, 2012). As medical use of cannabis is growing in Canada and other jurisdictions, and considering the more recent medical cannabis regulations in Canada (ACMPR), as well as the upcoming legalization of cannabis for recreational purposes (which may affect access for medical purposes), there is a need to assess patient experiences with access to authorization and sources of cannabis for medical purposes under different regulatory frameworks. Therefore, this literature review identifies and describes the factors associated with access to cannabis for medical purposes to inform research that will expand our understanding of what constitutes reasonable access to cannabis for medical purposes, and support efforts to assess and attain it.

2.2 Methods

A narrative review was conducted in order to summarize and classify prior knowledge regarding patient- and system-related factors that may be associated with reasonable access to cannabis for medical purposes. This type of review focuses on both conceptual and empirical sources, and while less comprehensive than systematic
reviews, this methodology is suitable for holistic interpretations that include the reviewers’ own experience and existing conceptual models (Paré, Trudel, Jaana, & Kitsiou, 2015). The strategy for this narrative review involved searching the following electronic databases to identify relevant qualitative, quantitative or mixed methods studies published in the past 15 years in peer-reviewed journals: PubMed, CINAHL, EMBASE, Medline, Web of Science, PAIS, Des Libris, and Google Scholar. Search terms included “medical marijuana” (MeSH), “health services accessibility” (MeSH), “health knowledge, attitudes, practice” (MeSH), “access to medical cannabis”, “accessibility to health services” (MeSH), and “barriers”. The search was expanded using relevant references from selected studies. Grey literature was searched as well, primarily reports from government and civil society, including health professional associations and colleges, and patient organizations. Patient- and system-related factors that may be associated with reasonable access to cannabis for medical purposes were identified and categorized into themes following a review of the literature. An iterative process was also used to reflect and theorize how these factors might fit into the Levesque model (described in Section 1.4 and Figure 1.2) based on the literature and my professional knowledge about, and experience with, patients using cannabis for medical purposes, Canada’s medical cannabis program and regulations, various sources of medical cannabis, as well as the social, legal and political context surrounding cannabis in Canada.

2.3 Summary of literature review findings

The primary articles reviewed in this chapter are described in Table 2.1.
2.3.1 Patient-related factors associated with access to cannabis for medical purposes

2.3.1.1 Demographic characteristics

Health Canada did not publish detailed demographic information about patients registered in the MMAR, however, some information about demographic characteristics can be gleaned from several studies and reports. In a Canadian online cross-sectional study of 628 individuals using cannabis for medical purposes from 2011-2012 (during the MMAR), 71% were male, with a mean age of 39 years (Walsh et al., 2013). Most participants in that study had some post-secondary education (58%), and reported a higher income than the general population; 33% reported a yearly household income of under $20,000 per year. In that sample, 78% lived in urban centres, and although only 32% were authorized under the MMAR, they exhibited a regional distribution that was consistent with authorization under the MMAR; approximately 38% resided in Ontario, 35% in British Columbia, 14% in the Prairies, 7% in the Maritimes and 5% in Quebec (Belle-Isle et al., 2014; Walsh et al., 2013). The statistics related to gender and age in that sample are consistent with other survey studies in California, the United Kingdom and Australia, as well as a large international survey spanning 31 countries, which also comprised a higher proportion of male respondents, and median age ranging from 40-45 years, with about a third of respondents over 50 years of age (Bonn-Miller, Boden, Bucossi, & Babson, 2014; Hazekamp, Ware, Muller-Vahl, Abrams, & Grotenhermen, 2013; Reiman, 2007; Reinarman et al., 2011; Swift, Gates, & Dillon, 2005; Ware, Adams, & Guy, 2005). A more recent international survey of 1,429 self-identified users of cannabis for medical purposes from 18 countries, primarily from the USA, reported younger respondents,
with a median age of 36.6 years, and fewer male respondents (54.6%) than in previous studies (Sexton et al., 2016). In an evaluation of medical cannabis registries tracking gender and age in 16 USA states, 59-69% of registered medical cannabis users were male, and 35-50% were over 50 years of age (Fairman, 2016). Results of a study tracking Dutch patients accessing cannabis through their national medical cannabis program (N=10,826) from 2011–2016 indicate a higher percentage of females (51.4%) than males were utilizing the program, and the largest age group was 41-60 years old (de Hoop, Heerdink, & Hazekamp, 2018).

Previous studies have identified some associations between demographic characteristics and access to authorization under the MMAR and to sources of cannabis for medical purposes in Canada. In terms of income level, in a cross-sectional study of 628 medical cannabis users, Belle-Isle et al. (2014) reported that lower income was positively associated with obtaining authorization under the MMAR. While income level was not associated with accessing cannabis from specific sources in that study, it was associated with accessing cannabis in general. Lower income individuals (i.e., <$20,000 yearly household income) were significantly more vulnerable to the cost of cannabis than those with higher incomes; 72% of those in the lowest income group reported sometimes or never being able to afford a sufficient quantity of cannabis for medical purposes, and 54% reported choosing between cannabis and other necessities (e.g., food, rent, other medicines). Affordability was a concern for many participants in that study; over half indicated that they never or only sometimes were able afford to buy a sufficient quantity of cannabis to relieve their symptoms, and 33% reported that they often or always chose between cannabis and other necessities.
Geographical location has also been identified as a factor associated with authorization and sources of cannabis in Canada. In Belle-Isle et al.’s study (2014), a significantly higher proportion of British Columbia and Ontario participants accessed cannabis from medical cannabis dispensaries (hereafter referred to as dispensaries), and a significantly higher proportion of participants from the Prairies and Maritimes accessed from a friend or acquaintance. Regional differences also emerged in that study regarding speaking to a physician about the use of cannabis for medical purpose, which is a requirement for obtaining authorization; significantly more patients reported discussing cannabis use with their physicians in British Columbia than in the Maritimes. Moreover, patients living in urban centres were more likely to speak with a physician about the appropriateness of cannabis to manage their health conditions and symptoms than those living in rural areas. Those living in rural areas were also more likely to obtain an authorization and to produce their own supply of cannabis. Another demographic characteristic associated with sources of medical cannabis was the patient’s age. A Canadian cross-sectional study of 445 individuals who used cannabis for medical purposes demonstrated that older age was positively associated with accessing cannabis from dispensaries compared to accessing cannabis from other sources (Capler, Walsh, et al., 2017).

In anticipation of the upcoming legalization of cannabis in 2018, the government of Canada conducted the first national cannabis-specific survey, which included a questionnaire about medical cannabis use; however, the results the government shared did not include demographic characteristics of medical cannabis users, thus limiting the potential for increased understanding of the access experiences for diverse groups (Government of Canada, 2017a). The data Health
Canada currently provides about its medical cannabis program also does not include demographic information such as gender, age, or medical conditions of patients (Health Canada, 2018c); instead, it focuses on their geographic location and amounts purchased, which are factors more relevant to the supply side of the program than to patient needs and perspectives. Supply-side factors were also the focus of Health Canada’s evaluation plan for the MMPR, which has not yet been published (Health Canada, 2012). To date, data presumably collected by LPs about their clients has also not been shared with the public.

2.3.1.2 medical conditions and symptoms

Under the MMAR, the majority (72%) of applications for authorization to possess cannabis involved Category 1 medical conditions (i.e., severe arthritis, spinal cord injury/disease, multiple sclerosis, cancer, AIDS/HIV, epilepsy, or compassionate (i.e., end-of-life) care). A minority (28%) of applications for authorization under the MMAR involved Category 2 conditions (i.e., any other symptoms for which conventional treatments have been deemed inappropriate) for which a specialist, in addition to a general practitioner, was required to support the application (Stambrook et al., 2012). Severe arthritis accounted for 65% of those authorized under the MMAR (Arthritis Society, 2016). Medical conditions and symptoms for which patients report using cannabis have been investigated in several studies. In a Canadian survey of 628 individuals who used cannabis for medical purposes, including those authorized and those not authorized under the MMAR, the most common conditions indicated for use were chronic pain, mental health conditions (i.e., anxiety and depression), and arthritis. In terms of symptoms for which cannabis was being used to address, 85% indicated they were using cannabis
for sleep issues, 82% to manage pain, 79% for anxiety, 67% to cope with depression, and nearly 50% to address symptoms related to appetite, nausea, inflammation and muscle spasms (Walsh et al., 2013). Similar medical conditions and symptoms were indicated in cross-sectional studies of medical cannabis users from other jurisdictions, including the USA, Germany, France, the Netherlands, Spain, and Australia (Bonn-Miller et al., 2014; Hazekamp et al., 2013; Reinarman et al., 2011; Ryan-Ibarra et al., 2015; Sexton et al., 2016; Swift et al., 2005). Other medical conditions of note for which patients have reported using cannabis include HIV/AIDS, multiple sclerosis, cancer, epilepsy, gastrointestinal disorders (e.g., Crohn’s and colitis), post-traumatic stress disorder (PTSD), migraines, and glaucoma.

Some associations between medical conditions for which patients are using cannabis, and access to authorization and sources of cannabis for medical purposes in Canada have been demonstrated in previous research. Belle-Isle et al. (2014) reported that individuals who identified HIV/AIDS as their primary medical condition related to cannabis use reported fewer obstacles to accessing cannabis, and those with HIV/AIDS and arthritis were also more likely than participants with other medical conditions to discuss cannabis with their physician, which would impact access to authorization in terms of obtaining the necessary medical documentation. Walsh et al. (2013), in their online survey, report a positive association between multiple sclerosis and gastrointestinal disorders and authorization under the MMAR, and a negative association between mental health conditions (anxiety and/or depression) and authorization. It has also been suggested in several Canadian studies that concurrent stigma related to mental health conditions and cannabis use may be a barrier to obtaining physician support to use cannabis for these conditions, especially
considering the psychoactive effects of cannabis, and experience with patients’ use of other substances, such as alcohol, to address symptoms such as anxiety and depression (Bottorff et al., 2013; Capler, Walsh, et al., 2017; Walsh et al., 2013, 2017).

In terms of sources accessed, Capler et al. (2017), in a cross-sectional study of 445 medical cannabis users in Canada, report that a higher proportion of those who used dispensaries were using cannabis for HIV/AIDS and arthritis, and a lower proportion were using cannabis for mental health conditions, compared with those not using dispensaries. In addition, Belle-Isle et al (2014), report that while poorer health was significantly associated with obtaining authorization under the MMAR compared to better health, those with poorer health were also nearly twice as likely as those with better health to report choosing between cannabis and other necessities, suggesting a barrier to cannabis sources rather than to authorization. It is possible that poorer health was also associated with income levels, due to reduced capacity to work, thus impacting ability to afford cannabis from any source.

2.3.1.3 patterns of cannabis use for medical purposes

Several studies have examined patterns of cannabis use for medical purposes in different jurisdictions. In a recent study of medical cannabis users in Canada, 81% used dried herbal cannabis, 30% used edible products, 14% used oils, 14% used solid concentrates, 11% used liquid concentrates, and 10% used tinctures (Government of Canada, 2017a). In a large cross-sectional study of medical cannabis users in Canada (Walsh et al., 2013), 57% of participants indicated a preference to administer cannabis used for medical purposes by smoking, 43% by vaporizing, and 28% by oral ingestion. Belle-Isle et al. (2014) reported that 93% of participants identified access to alternative
cannabis products (e.g., baked goods and tinctures) as important options. The preference for smoking cannabis is reflective of study results in the USA and other jurisdictions (Hazekamp et al., 2013; Reinarman et al., 2011). In an international survey of 953 individuals using cannabis for medical purposes in 31 countries (primarily from the USA, Germany, France, and Canada), 94.8% of respondents indicated using inhalation (86.8% smoke, 47.2% vaporize), 68.5% using oral or sublingual administration (edibles or tinctures), and 5% using topicals (Hazekamp et al., 2013). In another international survey of 1,429 individuals using cannabis for medical purposes, Sexton et al. (2016) reported the most common routes of medical cannabis administration were inhalation (84.1%), vaporization (16.3%), oral methods, including tinctures, capsules and edibles (8%), topicals (6%) and juicing (5%). Pacula et al. (2016), in a survey of 2009 participants (approximately 7%, or 140, having used cannabis for medical purposes) in four US states with medical cannabis laws (Washington, Oregon, Colorado, New Mexico) reported the most commonly declared routes of administration for those using cannabis for medical purposes were smoking (78%), eating (32%) and vaporizing (18%). Furthermore, Swift et al. (2005) in an Australian survey of 128 participants who used cannabis for medical purposes, reported 74% of medical cannabis users indicated that smoking was the most beneficial route. This finding coincides with a study by Hazekamp et al. (2013) that reported highest satisfaction rates for smoking (72.4%), followed by vaporizing (50%), and food/tincture (13.1%). However, a recent study of patients accessing cannabis through the Dutch program for medical cannabis observed a spike in participation after the introduction of cannabis oils in 2015, suggesting this may have become a more prevalent or preferred method of cannabis use (de Hoop et al., 2018).
Regarding the amount of cannabis used for medical purposes, Walsh et al. (2013), in their cross-sectional study of patients utilizing cannabis both within and outside of the MMAR, reported that 45% of participants used greater than 14 grams per week (i.e., 2 grams/day). Hazekamp et al. (2013) reported a mean daily dose of about 3 grams. Lower amounts of use have been reported in more recent studies; Sexton et al. (2016) reported 90.5% of medical cannabis users indicated using 7 grams or less per week, which corresponds with reported levels of use in a study of four states in the USA with medical cannabis laws (Pacula et al., 2016). In a recent survey by the Canadian government, medical cannabis users reported using an average of 1.4 grams per day (Government of Canada, 2017a). Health Canada’s MMAR program recommended that physicians authorize their patients to access a maximum of 5 grams per day. While the average amount used within the MMAR was 2.5 grams/day, the average daily dosage prescribed was 18.22 gram per day (Allard et al. v. Canada, 2016). This discrepancy may reflect amounts authorized for self-production or designated production, rather than amounts purchased though Health Canada’s contracted supplier; higher amounts may be required to mitigate possible crop failures, and may also be indicative of diversion to the illegal market. Under the ACMPR, the amount of cannabis shipped by LPs per client was 0.75 grams per day between January 1 and March 31, 2017. This amount suggests the possibility that patients are augmenting the amount of cannabis obtained from LPs with cannabis from other sources, since Health Canada statistics indicate patients were authorized by their healthcare practitioners to access, on average, 2.4 gram per day (Health Canada, 2017b). Indeed, previous studies have shown that under the MMAR, authorized patients accessed cannabis from both legal and illegal sources (Capler, Walsh, et al., 2017; Walsh et al., 2013), suggesting such augmentation is occurring.
Walsh et al. (2013), reported that ~75% of study participants authorized under the MMAR accessed cannabis from dispensaries, suggesting that dispensaries may be used by authorized patients to augment the cannabis accessed from legal sources. Another study reported that medical cannabis patients accessing cannabis from dispensaries in Canada indicated using a significantly higher quantity of cannabis than those not using dispensaries (Capler, Walsh, et al., 2017), which may reflect under-dosing among those who do not use dispensaries or over-consumption by dispensary users.

**2.3.2 System-related factors associated with access to cannabis for medical purposes**

**2.3.2.1 utilization of medical cannabis programs and sources**

As one indicator of legal access to cannabis for medical purposes in Canada, Health Canada authorized 35,000 patients to possess cannabis under the MMAR until it stopped accepting new applicants in October 2013. (Ramsay, 2014). This constituted an estimated 5% of medical users in the country, which suggests there were barriers to accessing the government’s medical cannabis program under the MMAR (Belle-Isle et al., 2014). Based on a projected growth rate of 40% per year under the MMAR, it was estimated that the number of people using cannabis for medical purposes under the MMPR would increase to 450,000 by 2024 (Beeby, 2013; Stambrook et al., 2012). Enrollment built slowly during the early stages of the MMPR, but increased rapidly thereafter; in April 2014, 5,100 patients were registered with an LP under the MMPR. The number of registered patients jumped to 8,000 in June 2014 and to 14,000 by the end of October 2014 (Keller, 2014). As of July 2017, ~170,000 patients were registered with one of Canada’s 52 LPs under the ACMPR (Health Canada, 2017a), and by December 2017 that number rose to ~269,000 patients (Health Canada, 2017b). This
number of registered individuals is thought to represent a small but increasing proportion of the estimated 1 million people in Canada who self-report using cannabis for medical purposes (Adlaf et al., 2005; Government of Canada, 2017b; Stockwell et al., 2006; Walsh et al., 2013). A recent survey commissioned by the Canadian government reported that among the 730 respondents who used cannabis for medical purposes recruited from the general population over the age of 16, 71% did not have a medical document from a healthcare professional for their use of cannabis, and 19% reported obtaining cannabis through the ACMPR (Government of Canada, 2017a). Together, these findings suggest that the majority of Canadians who use cannabis for medical purposes do so without federal approval and therefore experience barriers or other constraints to obtaining legal authorization.

In the USA, as of 2015, it was estimated that across the 23 states and 1 district with medical cannabis programs, approximately 650,000 individuals had enrolled nationwide; enrollment differed greatly between state programs, and 99.4% of all people were enrolled in 14 of 24 programs (Fairman, 2016). Another study of state medical cannabis programs in the USA demonstrated inverse correlations between enrollment and more rigorous state regulations (e.g., the requirement for state-licensed manufacturing and distribution as the only route of access to cannabis, and the requirement for standardized testing and labelling of cannabis products) as well as with registration costs (Williams, Olfson, Kim, Martins, & Kleber, 2016).

In terms of sources of cannabis for medical purposes, in Canada, 60% of patients authorized under the MMAR held a license for personal production of cannabis, 20% had licenses designating another individual to produce for them, 10% purchased cannabis from Health Canada’s contracted supplier, and the supply source
was unknown for the remaining 10% (Stambrook et al., 2012). A survey of 100 MMAR authorized patients in 2007 reported only 8% were obtaining cannabis from Health Canada’s contracted supplier, although approximately 50% had tried it at least once (Lucas, 2012), suggesting they were not satisfied with the product available. A Canadian cross-sectional study of 628 medical cannabis users reported that only 25% of those authorized under the MMAR were exclusively accessing cannabis from legal sources available to them; on average, those authorized under the MMAR accessed from significantly more sources (2.11) than those who were not authorized (1.78) (Walsh et al., 2013).

The main sources of cannabis used by those authorized under the MMAR included self-production with or without a license (50-70%), medical cannabis dispensaries (50-75%), and friends (38-55%) (Belle-Isle et al., 2014; Belle-Isle & Hathaway, 2007; Lucas, 2012; Walsh et al., 2013). In a large Canadian sample of medical cannabis users, including individuals authorized under the MMAR and those not authorized, 67% reported accessing cannabis from friends, followed by 48% from dispensaries and 28% from dealers/street sources (Belle-Isle et al., 2014; Walsh et al., 2013). These findings concur with a more recent Government of Canada survey of medical cannabis users in the general population, which reported 33% obtained cannabis from family or friends, 23% from dispensaries, and 22% from a dealer (Government of Canada, 2017a). Other studies purport the use of dispensaries by individuals authorized under the MMAR. One study reported that medical cannabis dispensary users in Canada were significantly more likely to have obtained Health Canada authorization to use cannabis for medical purposes than those not using dispensaries, which may be a result of the similar requirements for documentation
from healthcare professionals (Capler, Walsh, et al., 2017). Additionally, medical cannabis users authorized under the MMAR were reported to be more likely to use dispensaries than those who were unauthorized (Walsh et al., 2013).

A similar pattern of obtaining cannabis from multiple sources has been reported in international studies of individuals using cannabis for medical purposes. In a survey of 953 medical cannabis users in 31 countries, only 10.4% obtained cannabis from official sources, while 26.4% accessed cannabis from unofficial or tolerated outlets (e.g., coffee shops, dispensaries, buyer’s clubs); 54.4% accessed from legal or illegal home-growing; and 43.3% from other sources (including illegal sources, friends and family) (Hazekamp et al., 2013). An Australian survey of 128 self-identified medical cannabis users also reported access from multiple sources: 58% accessed from friends/family, 42% from dealers, 38% grew their own supply, and 6% accessed from dispensaries (Swift et al., 2005).

### 2.3.2.2 characteristics of cannabis products and services

Whereas cannabis is perceived by many patients to provide effective symptom relief across various medical conditions (Aggarwal et al., 2009; Ben Amar, 2006; Hill, 2015; Walsh et al., 2013), there are specific characteristics of cannabis that have been identified as important for such effectiveness to be realized. In particular, it has been theorized that some strains of cannabis (i.e., cultivars) may be beneficial for certain conditions while others may aggravate symptoms, possibly as a result of the ratio of cannabinoids Δ-9-tetrahydrocannabinol (THC) and cannabidiol (CBD), and terpenoid profiles (M. A. Lewis, Russo, & Smith, 2018; C. J. Morgan & Curran, 2008; Russo, 2011; Russo & Guy, 2006; Sawler et al., 2015; Schubart et al., 2011). Indeed, patients have
reported that strain type is an important determinant of effectiveness (Sexton et al., 2016; Walsh et al., 2013). Individuals who use cannabis for medical purposes in Canada have noted that having access to preferred strains, as well as a variety of strains, was important (Bottorff et al., 2011; Lucas, 2012). In addition to strains of raw plant cannabis, cannabis products such as baked goods and tinctures were also considered important options for approximately 90% of participants in two Canadian studies (Belle-Isle et al., 2014; Lucas, 2012).

Looking at the connection between product availability and appropriateness and access to sources of cannabis, Belle-Isle et al. (2014) noted incongruence between patient preferences and strains of cannabis and products provided by Health Canada’s contracted supplier under the MMAR. Whereas 93% of study participants identified access to a specific preferred strain and/or a variety of strains as important options, the supplier provided only a single strain of dried cannabis and no other products. Patients have expressed a negative assessment of the product from this source; as many as 75% assessed it as low quality, there was a 30% return rate for the product, and concerns about the quality of the product were expressed by patient advocacy groups (Belle-Isle et al., 2014; Canadians for Safe Access, 2004, 2005, Lucas, 2008, 2012). In a study of 100 MMAR authorized medical cannabis users in Canada, 97.6% indicated they would prefer to obtain cannabis from a source that offers a “large selection of different strains” (Lucas, 2012). In another Canadian study, a significantly higher proportion of patients who used dispensaries compared to those who did not use dispensaries considered access to a specific strain to be important, suggesting that consistent access to a variety of strains may be one of the reasons for their use of this source (Capler, Walsh, et al., 2017).
Characteristics of services provided by medical cannabis programs and sources have also been shown to be relevant to access. A cross-sectional study of 150 patients at medical cannabis facilities in California reported high ratings on four dimensions of patient satisfaction, including general, interpersonal, access and privacy (Reiman, 2007). The most important reasons for choosing a facility were reported as familiarity with facility, staff, comfort and security. A study looking at sources of cannabis utilized for medical purposes in Canada assessed satisfaction levels with different sources in terms of quality of product, safety of access, availability of product, efficiency of access, cost, and feeling respected (Capler, Walsh, et al., 2017). In that study, it was reported that individuals accessing cannabis from dispensaries as well as other legal and illegal sources (i.e., friend, self-production, other producer, street and Health Canada’s contracted supplier) rated dispensaries equal to or significantly more favourably than those other sources on all parameters except cost; cost was rated significantly more favourably for self-production and other producers, and significantly less favourably for street sources. These findings concur with findings from other Canadian studies wherein patients cited personal production (legal or illegal) and dispensaries as their top choices of cannabis sources (Belle-Isle & Hathaway, 2007; Lucas, 2012). The most important reason indicated for self-production in a Canadian study of medical cannabis patients was the quality of the product (39%), followed by price (36%), avoiding the illegal market (29%), selection of a specific strain of cannabis (24%), and safety (12%) (Belle-Isle et al., 2014).

Patient groups continued to express concerns about the availability and quality of cannabis for medical purposes under the MMPR (British Columbia Civil Liberties Association, 2013; Canadian AIDS Society, 2013; Canadian Association of Medical
Cannabis Dispensaries, 2013). Anecdotal evidence from newspaper articles suggests some patients were unable to obtain an adequate and appropriate supply of cannabis from the LPs with which they registered (Ramsay, 2014). Under the MMPR, LPs were permitted to provide a wide variety of cannabis strains; however, the regulations did not initially include provision of cannabis products other than dried cannabis. In June 2015, the Supreme Court of Canada ruled that restricting the MMAR to only dried cannabis was too restrictive and violated the Charter (R. v. Smith, 2015). As a result of that ruling, the MMPR, which was in effect at the time of the decision, was amended to include provisions for other forms of cannabis (i.e., fresh cannabis and cannabis oil). Such provisions were also included in the ensuing ACMPR. Health Canada’s Performance Measurement and Evaluation Plan to assess implementation activities and outputs for the MMPR, however, did not include patient-centred outcomes, including satisfaction with availability and appropriateness of products and services permitted under the regulations and offered by LPs (Health Canada, 2012).
2.3.2.3 healthcare practitioner support for access to medical cannabis programs and sources

Researchers have identified gatekeepers to health services as potential barriers to accessing health services (Gulliford et al., 2002; Ricketts & Goldsmith, 2005). Studies of physician attitudes toward the medical use of cannabis in various jurisdictions have demonstrated a mixed level of support (Adler & Colbert, 2013; Charuvastra, Friedmann, & Stein, 2005; Ebert et al., 2015; Kondrad & Reid, 2013; Uritsky, McPherson, & Pradel, 2011; Zolotov, Vulfsons, Zarhin, & Sznitman, 2018). Health Canada’s medical cannabis program, regulated by the MMAR, MMPR, and ACMPR, have placed physicians in the role of gatekeepers, requiring doctors to support patients’ applications for authorization and access to legal sources of cannabis. With Health Canada removed from the authorization process under the MMPR and ACMPR, the entire onus for authorizing patients shifted onto healthcare professionals. In several Canadian studies, physicians have expressed reluctance to take on this role, citing inadequate knowledge of therapeutic benefits and potential risks associated with cannabis, the illegality of cannabis in Canadian society, and related stigma attached to cannabis (Jones & Hathaway, 2008; Ziemianski et al., 2015). Blurred boundaries between medical and recreational cannabis use may also be a deterrent for healthcare practitioners to support the use of cannabis for medical purposes (Belackova et al., 2015; Ziemianski et al., 2015).

Physician colleges and associations in Canada have expressed persistent concern about their gatekeeping role and have withheld support for the government medical cannabis program, stating that safety and risks have not been adequately studied in relation to cannabis use, appropriate dosage is unclear, cannabis is
unapproved as a drug in Canada, as well as medico-legal liability concerns (Allan et al., 2018; Canadian Medical Association, 2011, 2013a, 2013b, Canadian Medical Protective Association, 2005, 2016; Charuvastra et al., 2005; College of Family Physicians of Canada, 2013; Federation of Medical Regulatory Authorities of Canada, 2013; Jones & Hathaway, 2008). The Canadian Medical Association reiterated its concern about the role of physicians in the medical cannabis program, advocating for the termination of the medical cannabis program in light of legalization of cannabis for recreational purposes (Canadian Medical Association, 2016). Nurse practitioners were added as additional gatekeepers under the MMPR and ACMPR; however, provincial/territorial colleges across Canada have not yet adopted the regulations (College of Registered Nurses of British Columbia, 2013, 2015; The Canadian Nurses Protective Society, 2017). Specialty clinics have opened up across the country to fill the gap, charging patients a fee to connect them with supportive physicians and register them with LPs from whom these clinics may also be receiving compensation, raising ethical concerns (Israel, 2017; Valleriani, 2014). Some of the provincial and territorial medical regulatory authorities have stated that physicians must not charge fees to patients associated with providing documentation for access to cannabis for medical purposes (College of Physicians and Surgeons of British Columbia, 2016; College of Physicians and Surgeons of Ontario, 2015). According to Health Canada records, it appears that the number of healthcare practitioners providing documentation for access to medical cannabis through LPs has been increasing, with approximately 11,000 of 80,000 physicians in Canada having provided documentation for the 269,000 patients who had registered in the ACMPR by the end of 2017 (Canadian Medical Association, 2018a; Health Canada, 2018c).
Patients have identified physicians as a key barrier to access under the MMAR. The difficulty experienced by patients in obtaining physician support was the main issue of a court challenge to the MMAR that declared the program unconstitutional (R. v. Mernagh, 2011). In a Canadian survey, 50% of respondents (n= 100) reported difficulty finding a physician to support their application (Lucas, 2012). Belle-Isle et al. (2014) reported 32% of study participants (n= 628) sought a new physician in relation to their use of cannabis for medical purposes, with many of those (57%) changing physicians more than once. In that study, it was also reported that compared to their communication with their physician regarding other medical issues, 50% of participants were less satisfied with their communication about the use of cannabis for medical purposes, and 31% reported that they often or always felt discriminated against by their physician because of their use of cannabis. Additionally, 38% of participants reported that they had not talked to any doctor about their use of cannabis (Belle-Isle et al., 2014). While part of the reluctance has been reported to be on the side of physicians, patients have also expressed discomfort in broaching the topic due to the legal status of cannabis and fear of negative repercussions on their relationship with their physician (Belle-Isle et al., 2014; Bottorff et al., 2013; Satterlund, Lee, & Moore, 2015). In terms of sources of access, a Canadian study reported that medical cannabis dispensary users were substantially more likely to have discussed their use of cannabis with a physician than non-dispensary users, highlighting the requirement of most dispensaries at the time of the study to obtain medical documentation from healthcare providers, which was also a potential barrier to accessing this source (Capler, Walsh, et al., 2017).
2.3.2.4 affordability of access to medical cannabis programs and sources

Studies of access to cannabis for medical purposes in Canada have shown that cost is a substantial barrier to access, whether obtained legally under the government program or outside of the legal framework. Costs include direct costs, such as the price of product, and indirect costs, such as fees for obtaining required medical documents. Both types of costs comprise opportunity cost, resulting in individuals forgoing other basic life necessities. Respondents to a Government of Canada survey reported spending an average of $121 per month for cannabis used for medical purposes; 13% reported receiving dried herbal cannabis, and 33% reported receiving edible products for free (Government of Canada, 2017a). In Belle-Isle et al.’s study (2014), participants who used cannabis for medical purposes reported a median cost of $200 per month for cannabis; moreover, 40% of MMAR applicants were charged to have their application completed by a physician, with charges ranging from $10 to $800. In a survey study of HIV/AIDS patients in Canada (n=197), 13% indicated they were not using cannabis because of the cost (Belle-Isle & Hathaway, 2007). The affordability of accessing the medical cannabis program and sources interacts with patients’ income level, as discussed above in Section 2.3.1.1, which includes findings about medical cannabis users choosing between medical cannabis and other necessities.

In terms of affordability related to specific sources of cannabis, although production and shipping costs were highly subsidized by the Canadian government under the MMAR, many patients considered the price charged by Health Canada’s contracted supplier at $5 per gram was too high; personal or designated production, therefore, offered the most cost-effective options for access under the MMAR (Belle-
Isle & Hathaway, 2007). A cost-benefit analysis commissioned by Health Canada projected that there would be a 30% decrease in the relative number of individuals who would obtain cannabis from legal sources over the next 10 years due to a potential increase in price of cannabis under the MMPR (Stambrook et al., 2012). The MMPR Regulatory Impact Analysis Statement also indicated a likely increase in the price of cannabis charged to patients (Government of Canada, 2013). Patient groups expressed concerns about the cost of cannabis under the MMPR (British Columbia Civil Liberties Association, 2013; Canadian AIDS Society, 2013; Canadian Association of Medical Cannabis Dispensaries, 2013), and an ensuing court case deemed the MMPR to be unconstitutional for not providing adequate access to cannabis to those in medical need, citing “irreparable harm” would be caused to patients who would be unable to afford cannabis under the MMPR (Allard et al. v. Canada, 2016). This case resulted in the creation of the ACMPR, which re-instated the more affordable options of personal and designated production as legal sources of cannabis.

To address affordability, patient advocates have been calling for coverage by both private and public health insurance plans, as well as for medical cannabis to be exempt from current taxes, and from the proposed excise taxes to be implemented under the new legalization regulations for recreational cannabis (Canadians for Fair Access to Medical Marijuana, 2016, 2018; Department of Finance Canada, 2017a). A private insurer recently announced they will provide coverage for medical cannabis under certain circumstances (Ligaya, 2018), and a pilot study has been announced to provide medical cannabis coverage for students while assessing potential cost savings to the health care system (Hayes, 2018). Additionally, Veterans Affairs Canada has established a reimbursement policy for veterans accessing cannabis from LPs under
the ACMPR (Veterans Affairs Canada, 2017). Although many patients who use cannabis for medical purposes access cannabis from dispensaries, cost coverage programs do not apply to this source. Participants in a Canadian study did not rate these sources favourably for cost; individuals were more satisfied with the cost of accessing cannabis from self-production and other growers, suggesting that sources closest to production are able to provide cannabis at the lowest cost (Capler, Walsh, et al., 2017).

2.4 Discussion

This review identified patient- and system-related factors relevant to access to medical cannabis authorization and sources in Canada. Regarding patient-related factors that emerged from the literature, several demographic characteristics were associated with access to authorization and source. In Canadian studies, individuals with lower income were more likely to have authorization (MMAR), and were also more likely to have difficulties affording a sufficient quantity of cannabis to relieve their symptoms, and to report choosing between cannabis and other necessities. Geographical region and residential type (i.e., rural or urban/suburban) were also associated with both authorization status and source; with respect to authorization, individuals living in British Columbia and urban centres were more likely to speak with their physicians about cannabis use for medical purposes and those in rural areas were more likely to have obtained authorization (MMAR). Regarding sources of cannabis, those living in British Columbia and Ontario were more likely to access cannabis from dispensaries, those from the Maritimes and the Prairies were more likely to access from friends and acquaintances, and those living in rural areas were more likely to produce their own supply of cannabis. Older age was associated with
accessing cannabis from dispensaries compared to other sources. In terms of medical conditions, those with HIV/AIDS, arthritis, multiple sclerosis, and gastrointestinal disorders were more likely to have obtained authorization for medical cannabis use under the MMAR than those with other conditions; those with mental health conditions were significantly less likely to be authorized. Additionally, those accessing cannabis from dispensaries tended to use larger quantities (grams/day) of cannabis than those not accessing from dispensaries. These patient-related factors are important to consider since they can help determine if the needs of patients are being served equitably by the legal medical program and related sources.

Regarding system-related factors, a higher degree of patient engagement was associated with legal programs that had less rigorous regulations and lower registration costs in the USA. Product and service characteristics, including availability of specific strains, quality of cannabis, cost of cannabis, safety of access, efficiency of access and feeling respected appear to be relevant to the choice of, and satisfaction with, sources. Regarding healthcare practitioner support, individuals who used dispensaries were more likely to have discussed their cannabis use with a healthcare practitioner than those not using this source. Finally, in terms of affordability, satisfaction with cost of cannabis was significantly higher for ‘self-production’ and ‘other growers’ than for other sources (i.e., friends, street, dispensaries, and Health Canada’s supplier). Such system-related factors provide insight into how policies and program may impact reasonable access to cannabis for medical purposes in Canada. Descriptive data from the reviewed studies and grey literature point to other factors that may be of interest in relation to medical cannabis access (e.g., ratios of cannabinoids in products, stigma, and importance of avoiding
the illegal market). These patient- and system-related factors need to be examined with respect to their impact on access to authorization and sources as regulatory changes occur. It is also possible that there may be other factors yet to be identified that are relevant to different regulations for medical cannabis and in changing contexts (i.e., legalization of cannabis and private insurance coverage).

Additionally, the Levesque model of access to health care can inform our understanding of how these factors may impact access to cannabis for medical purposes at different stages of access. Table 2.2 illustrates how the patient- and system-related factors examined in the literature can theoretically fit into the Levesque model. For example, demographic factors such as income level, could impact patients’ ability to pay for medical cannabis or medical documentation, thus affecting their participation in the legal program or their use of cannabis sources at the utilization stage of access. Healthcare practitioners’ values and medical opinions, and the position of their regulatory bodies regarding cannabis and the medical cannabis program, could impact their willingness to support access by providing medical documentation, thus influencing the seeking stage of access. The characteristics of the medical cannabis program or sources, such as strains and products available from legal sources, may determine whether patients wish to pursue access through the program, impacting the perception need and desire for care stage of access. The characteristics of programs and sources could also impact their appropriateness for patients, thus affecting satisfaction and health outcomes at the consequences stage of access. The Levesque model can also help us identify gaps in research; for example, outreach and marketing efforts by sources of cannabis may differently impact their approachability for individuals with different demographic
characteristics or medical conditions impacting the perception of needs and desire for care stage of access.

There are several limitations to this review of the literature on access to cannabis for medical purposes. Regarding the review itself, as a narrative review of the literature, some studies may have been missed that would have been captured in a systematic review. A protocol for a systematic review focusing on structural barriers to medical cannabis access has been recently developed, but the actual review has yet not been published (Valencia, Asaolu, Ehiri, & Rosales, 2017). With respect to the studies reviewed in this chapter, several limitations should be noted. First, while most studies in this review provided descriptive data on patient- and system-related factors, few researchers have examined possible associations between these factors and access to medical cannabis programs and sources. Second, the cross-sectional nature of the majority of studies does not permit inferences about causation to be made. Third, it is also possible other factors not examined in these studies are relevant to measuring access to medical cannabis from a patient perspective. As such, the use of qualitative and mixed methods study designs should be pursued in future research on this topic to more fully elucidate all factors influencing patients’ access to medical cannabis. Additionally, respondents to most of the surveys included in this review were self-selected, potentially resulting in response bias. Many of the study samples were recruited through organizations supportive of medical cannabis use, which could further contribute to a response bias. However, data generated from government registries and through general population recruitment appear to concur with the findings from convenience sample studies. Finally, most surveys were conducted online, and therefore, excluded segments of the population that do not
have access to computers or lack computer literacy. Consequently, factors impacting access to medical cannabis for marginalized or underserved individuals (e.g., low incomes, housing insecurity, low literacy, elderly) may not have been acknowledged.

In summary, this narrative review identified patient and system factors related to medical cannabis access. The current study aimed to build upon this previous research by exploring, quantitatively and qualitatively, how these factors are associated with access to medical cannabis authorization and sources, under the MMAR and MMPR, and outside the legal framework in Canada. This study also sought to identify other relevant factors that may have been overlooked in past research. Including such factors in future research will allow a comparison of access under different regulatory frameworks in Canada, and other jurisdictions, to be undertaken. The following chapters will further explore the Levesque model as a framework for understanding access to cannabis for medical purposes and to ascertain if reasonable access to medical cannabis has been achieved.
### Table 2.1 Description of key studies on medical cannabis use and access

<table>
<thead>
<tr>
<th>Author/year/country</th>
<th>Study design</th>
<th>Sample population</th>
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<tbody>
<tr>
<td><strong>Belle-Isle et al.</strong>&lt;br&gt;2014 Canada</td>
<td>Cross-sectional online survey (same data set as Walsh et al. 2013)</td>
<td>Sample size: 628&lt;br&gt;Self-identified English or French speaking current adult medical cannabis users *</td>
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<tr>
<td><strong>Bonne-Miller et al.</strong>&lt;br&gt;2014 USA</td>
<td>Cross-sectional survey, administered at dispensary&lt;br&gt;Recruited from a dispensary in California</td>
<td>Sample size: 217&lt;br&gt;Self-identified current adult medical cannabis users</td>
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<tr>
<td><strong>Capler et al.</strong>&lt;br&gt;2017 Canada</td>
<td>Cross-sectional online survey (subset of data set from Walsh et al. 2013)</td>
<td>Sample size: 445&lt;br&gt;Self-identified English or French speaking current adult medical cannabis users *</td>
</tr>
<tr>
<td><strong>Fairman,</strong>&lt;br&gt;2016 USA</td>
<td>Descriptive data from 16 state registries</td>
<td>Sample size: 440,000&lt;br&gt;Medical cannabis users registered in 16 States</td>
</tr>
<tr>
<td><strong>Government of Canada,</strong>&lt;br&gt;2017 Canada</td>
<td>Cross-sectional online survey&lt;br&gt;Recruited by phone from list of random telephone numbers</td>
<td>Sample size: 730&lt;br&gt;Self-identified medical cannabis users, use in past year **</td>
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<tr>
<td><strong>Hazekamp et al.</strong>&lt;br&gt;2011 31 countries (38.5% USA, 16.6% Germany, 7.9% France, 7.5% Canada, 5.5% Netherlands, 5.1% Spain)</td>
<td>Cross-sectional online survey&lt;br&gt;Recruited from website of international cannabis organization and newsletter</td>
<td>Sample size: 953&lt;br&gt;Self-identified medical cannabis users, experience with at least 2 forms of cannabis based medicines (English, French, Spanish, German and Dutch speaking)</td>
</tr>
<tr>
<td><strong>Lucas</strong>&lt;br&gt;2011 Canada</td>
<td>Cross-sectional online survey&lt;br&gt;Recruited online and by mail, from medical cannabis patient internet discussion groups and dispensaries</td>
<td>Sample size: 100&lt;br&gt;Federally authorized medical cannabis users *</td>
</tr>
</tbody>
</table>

*Data collected during time of Marihuana Medical Access Regulations (MMAR) in Canada<br>**Data collected during time of Access to Cannabis for Medical Purposes Regulations (ACMPR) in Canada
Table 2.1 Description of key studies on medical cannabis use and access (continued)

<table>
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<tr>
<th>Author/year/country</th>
<th>Study Design</th>
<th>Sample population</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pacula et al.</strong> 2016 USA</td>
<td>Cross-sectional online survey Recruited from ongoing probability-based internet panel of 50,000 people in 4 states with medical cannabis laws (Washington, Oregon, Colorado, New Mexico)</td>
<td>Sample size: 140 Self-identified English-speaking medical cannabis users (asked about source of medical recommendation)</td>
</tr>
<tr>
<td><strong>Reinarman et al.</strong> 2011 USA</td>
<td>Cross-sectional data Data from 9 medical cannabis assessment clinics in California - medical history form completed by patient and physician</td>
<td>Sample size: 1746 Individuals seeking assessment for access to medical cannabis program</td>
</tr>
<tr>
<td><strong>Sexton et al.</strong> 2016 18 countries (77.8% from USA, 5.6% United Kingdom, 3.1% Canada)</td>
<td>Cross-sectional online survey Convenience sample recruited through cannabis policy websites, social media, Washington State dispensaries</td>
<td>Sample size: 1429 Self-identified medical cannabis users, cannabis use in last 90 days</td>
</tr>
<tr>
<td><strong>Swift et al.</strong> 2005 Australia</td>
<td>Cross-sectional mail-out survey Recruited from media stories and cannabis-related organizations</td>
<td>Sample size: 128 Self-identified adult medical cannabis users, current or past cannabis use</td>
</tr>
<tr>
<td><strong>Walsh et al.</strong> 2013 Canada</td>
<td>Cross-sectional online survey Recruited online through medical cannabis and patient networks and through one BC dispensary</td>
<td>Sample size: 628 Self-identified English or French speaking current adult medical cannabis users *</td>
</tr>
</tbody>
</table>

*Data collected during time of Marihuana Medical Access Regulations (MMAR) in Canada
**Data collected during time of Access to Cannabis for Medical Purposes Regulations (ACMPR) in Canada
Table 2.2 Theoretical influence of patient and system factors on access to cannabis for medical purposes (authorization and sources)

<table>
<thead>
<tr>
<th>Health care needs</th>
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<th>Health care seeking</th>
<th>Health care reaching</th>
<th>Health care utilization</th>
<th>Health care consequences</th>
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<tbody>
<tr>
<td>Patient factors</td>
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<td>Ability to seek</td>
<td>Ability to reach</td>
<td>Ability to pay</td>
<td>Ability to engage</td>
</tr>
<tr>
<td>- Demographics</td>
<td>- Demographics</td>
<td>- Demographics</td>
<td>- Demographics (e.g., age, geographical location, income)</td>
<td>- Demographics (income level)</td>
<td></td>
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<tr>
<td>- Medical conditions</td>
<td>- Medical conditions</td>
<td>- Medical conditions</td>
<td>- Medical conditions</td>
<td>- Patterns of use (amount needed)</td>
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<tr>
<td></td>
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<td>- Patterns of use</td>
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<td>- Satisfaction</td>
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<tr>
<td>System factors</td>
<td>Approachability</td>
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</tr>
<tr>
<td></td>
<td>- Characteristics of program and sources</td>
<td>- Health care professionals' values and medical opinions (e.g., documentation)</td>
<td>- Characteristics of program and sources</td>
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<td>- Characteristics of program and sources (products and services provided)</td>
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CHAPTER 3: EXPLORING PATIENT AND SYSTEM FACTORS ASSOCIATED WITH MEDICAL CANNABIS ACCESS IN CANADA: A COMPARISON OF AUTHORIZATION STATUS

3.1 Introduction

The goal of Canada’s medical cannabis program is to provide reasonable access to cannabis for medical purposes, in line with the country’s policy to facilitate reasonable access to health services without financial or other barriers (Canada Health Act, 1984). Authorization under the program’s Marihuana Medical Access Regulations (MMAR) and subsequent Marihuana for Medical Purposes Regulations (MMPR), and current Access to Cannabis for Medical Purposes Regulations (ACMPR) have allowed individuals to legally possess cannabis and acquire it from a legal source (See figure 1.1). This chapter focuses on patient- and system-related factors associated with the authorization aspect of legal access to cannabis for medical purposes in Canada under the MMAR and MMPR.

The MMAR, which came into effect in 2001, set out a process to authorize individuals with a demonstrated medical need to possess and obtain a legal supply of cannabis (Government of Canada, 2001). This government-administered program created two categories of applicants: Category 1 required a physician’s signature on a medical declaration in support of applications for patients suffering from symptoms related to end of life care, cancer, HIV/AIDS, spinal cord injury, epilepsy and arthritis; and Category 2 required an additional assessment by a medical specialist for those suffering from symptoms related to other medical conditions for which conventional treatments had been deemed inappropriate. The medical declarations were sent to Health Canada, along with application forms, for review and processing. Successful
applications resulted in an Authorization to Possess license, which allowed a patient to access cannabis from legal sources, which at that time consisted of personal production, designated production – each requiring a separate license - or purchasing from Health Canada’s contracted supplier.

The MMPR, enacted on October 1, 2013, were meant to replace the MMAR, overlapping with those regulations until the scheduled repeal of the MMAR on March 31, 2014 (Government of Canada, 2013). The MMAR, however, continued past that date as a result of a court injunction allowing individuals who were previously authorized under the MMAR to continue to produce cannabis through personal or designated production until a constitutional challenge to the MMPR could be heard (Allard et al. v. Canada, 2014). The MMPR included fundamental changes to the authorization process and the legal sources of cannabis for medical purposes. Under the MMPR, Health Canada no longer played a central role in the authorization of individuals to possess cannabis for medical purposes; instead, healthcare practitioners, including physicians and nurse practitioners, were solely responsible for authorizing access to cannabis. The application process was streamlined and did not delineate a category requiring specialist support. In addition, personal and designated production were to be replaced by commercial licensed producers (LPs), which were to become the only legal source of cannabis for authorized patients in Canada.

Approximately 35,000 individuals were authorized under the MMAR, representing a small fraction of the estimated one million people in Canada who self-reported using cannabis for medical purposes (Adlaf et al., 2005; Stockwell et al., 2006). This suggests there may have been barriers to authorization under these
regulations. Previous research has explored the access experience of patients who used cannabis for medical purposes, both within and outside the MMAR (Belle-Isle et al., 2014; Belle-Isle & Hathaway, 2007; Bottorff et al., 2013; Bottorff, Bissell, et al., 2011; Hathaway & Rossiter, 2007; Lucas, 2012; Walsh et al., 2013). In a large national survey of 628 medical cannabis users in Canada, 86% of respondents reported experiencing obstacles to access under the MMAR (Belle-Isle et al., 2014; Walsh et al., 2013). The most common barriers to access identified in past studies included difficulties obtaining the necessary documentation from a physician, problems with the supply options, and the high cost associated with access (Belle-Isle et al., 2014; Belle-Isle & Hathaway, 2007; Bottorff et al., 2013). Few differences were reported between MMAR authorized and unauthorized patients with regard to their demographic characteristics, medical conditions, severity of symptoms, and patterns of cannabis use, suggesting that this program may have been leaving many qualified patients without legal authorization (Belle-Isle et al., 2014; Walsh et al., 2013). The lack of legal authorization potentially places patients at risk of legal sanction and associated stigma (Bottorff et al., 2013).

Since the implementation of the MMPR, there has been no rigorous national evaluation undertaken to assess changes to access from a patient-centred perspective in order to determine whether reasonable access to cannabis for medical purposes has been achieved, and for whom. It is uncertain whether the barriers to access that existed under the MMAR have persisted under the MMPR, or if new barriers associated with access to the MMPR have arisen. Thus, an objective of this study was to identify the patient- and system-related factors associated with legal authorization status among adults in Canada who use cannabis for medical purposes. This
assessment will provide a foundation for future assessments of the current regulations, the ACMPR, and will inform future amendments that may arise from the upcoming legalization of cannabis for recreational purposes.

3.2 Methods

This study employed a cross-sectional design with data obtained via an online survey administered to a national sample of individuals using cannabis for medical purposes, as described in detail in Section 1.6. For the analyses in this chapter, all study participants who completed the survey and indicated current use of cannabis for medical purposes were included.

3.2.1 Variable selection

The primary outcome of interest for the present analysis was authorization status. Participants identified as either: (1) using cannabis under the MMAR (MMAR status); (2) using cannabis under the MMPR (MMPR status); or (3) as not being authorized under either of these Health Canada regulations (i.e., no Health Canada authorization (No HC status)). Informed by the Levesque et al. patient-centred conceptual framework of access to health care (the Levesque model), described in Section 1.4 (see Figure 1.2 and Table 2.2), and previous studies exploring the barriers to accessing cannabis for medical purposes (See Chapter 2), explanatory variables that were hypothesized to be potentially associated with authorization status were selected. These included a range of sociodemographic, health-related, and patterns of use factors that are described in detail below.

Sociodemographic factors examined included: age in years was collected and this variable was dichotomized following a review of the distribution of ages (mean
or median); gender ¹ (female vs. male); ethnicity - defined as identifying as only Caucasian or identifying with another ethnocultural background (Caucasian vs. other); residence location (urban/suburban vs. rural); province - Ontario was used as a reference (ref) because the majority of the study participants were from this province (Ontario (ref) vs. BC vs. Prairies vs. Quebec vs. Atlantic); yearly household income (≥ $20,000 vs. < $20,000, representing low income cut-offs for individuals in Canada in 2013-2014, in Canadian dollars (Statistics Canada, 2015)); employment – employed was defined as full-time, part-time, casual or self-employed, and other was defined as unemployed, retired, on disability or student (employed vs. other); and education (≥ post-secondary vs < post-secondary).

Health-related factors examined in the analysis included medical conditions and reasons for use of medical cannabis. Medical conditions were categorized a priori and included: chronic pain (yes vs. no); arthritis (yes vs. no); mental health (yes vs. no); respiratory (yes vs. no); nervous system (yes vs. no); gastrointestinal (yes vs. no); cardiovascular (yes vs. no); endocrine (yes vs. no); cancer (yes vs. no); and HIV/AIDS (yes vs. no); and miscellaneous conditions, defined as conditions that did not fall into the other categories (e.g., shingles, glaucoma, Hepatitis C) (yes vs. no). Reasons for using medical cannabis included: pain (yes vs. no); sleep (yes vs. no); mental health (yes vs. no); well-being (yes vs. no); nausea and vomiting (yes vs. no); inflammation (yes vs. no); loss of appetite and weight loss (yes vs. no); spasms (yes vs. no); and ‘other’ miscellaneous reasons defined as reasons that did not fall into the above

¹There were few participants self-reporting other gender categories (e.g., transgendered), analysis was restricted to those who identified their gender as male or female.
categories (yes vs. no). Respondents could select as many medical conditions and reasons for use as applied to them, and these were self-reported rather than confirmed by a healthcare professional’s diagnosis.

Patterns of use factors explored in this analysis included quantity of cannabis used per day and mode of using cannabis. Quantity used per day was defined using Health Canada’s suggested upper limit under the MMAR and MMPR of 5 grams/day (>5g/day vs. ≤5g/day) and the median amount used by participants in this study of 2.5 grams/day (>2.5g/day vs. ≤2.5g/day). Mode of use included any inhalation, defined as an amalgamation of smoked herbal cannabis, vaporized herbal cannabis and inhaled concentrates (yes vs. other); smoked herbal cannabis (yes vs. no); vaporized (yes vs. no); inhaled concentrates (yes vs. no); edibles (yes vs. no); juiced (yes vs. no); ingested concentrates (yes vs. no); tinctures (yes vs. no); and topicals (yes vs. no).

We also explored system-related factors hypothesized to be associated with authorization status. These included various problems related to accessing both authorization and cannabis. Problems that were considered included: getting documentation (yes vs. no); cost of medical cannabis (yes vs. no); finding effective strains and products (yes vs. no); availability of medical cannabis (yes vs. no); waiting time for registration (yes vs. no); waiting time to receive product (yes vs. no); not enough information (yes vs. no); other problems (yes vs. no).

3.3.2 Statistical analysis

As a first step, baseline descriptive statistics were conducted to explore the characteristics of the study sample, stratified by authorization status (Tables 3.1-3.6).
To examine bivariate associations between the explanatory variables of interest and authorization status (Tables 3.2, 3.4-3.6), multinomial logistic regression analyses were conducted and 95% confidence intervals were calculated. Only complete cases were included, missing data was less than 5%. For the multivariate analysis (Table 3.3), we applied an a priori defined statistical protocol based on examination of the Akaike Information Criterion (AIC) and p-values to construct an explanatory, multivariate multinomial logistic regression model. First, we constructed a full model including all variables with \( p < 0.10 \) in bivariate analyses. After noting the AIC of the model, we removed the variable with the largest p-value and built a reduced model. We continued this iterative process until no variables remained for inclusion. We assessed multicollinearity using the Variance Inflation Factor. We selected the multivariate model with the lowest AIC score. All p-values were two-sided.

### 3.3 Results

A total of 380 survey respondents indicated they were current users of cannabis for medical purposes. This study included 369 participants, excluding only those missing data on income (n=7) and those who identified as transgender (n=4). This analysis comprised three authorization status sub-groups: 1) MMAR status (n=178; 48.2%); 2) MMPR status (n=59; 16%); 3) No HC status (n=132; 35.8%).

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2 Participants who identified as transgender were not asked to indicate which gender they identified with, and given the small sample, an analysis with this gender category was not possible.
3.3.1 Sociodemographic factors associated with authorization status

Among the 369 study participants, 158 (42.8%) were women and 313 (84.2%) were people of Caucasian ancestry. The median age was 48 years\(^3\) (interquartile range = 36, 56). The majority of participants (74.5%) lived in urban or suburban centres. The largest segment was from Ontario (37.4%), followed by British Columbia (30.9%), and the Prairie provinces (15.4%). In terms of socioeconomic status, 66.7% had an annual income above $20,000, and 74.5% had post-secondary education. The majority (61.8%) of the sample was not employed. The descriptive presentation of sociodemographic characteristics stratified by authorization status is presented in Table 3.1.

The results of the bivariate analyses of associations between sociodemographic characteristics and authorization status are shown in Table 3.3. Female gender was significantly and negatively associated with MMAR status compared to No HC status (odds ratio [OR]: 0.53; 95% confidence interval [CI]: 0.34-0.84). Residence in British Columbia vs. Ontario was significantly and negatively associated with MMPR status in comparison to both No HC status (OR: 0.29; 95% CI: 0.13 – 0.69) and MMAR status (OR: 0.32; 95% CI: 0.14 – 0.73).

Table 3.4 shows the results from the multivariate analyses of sociodemographic factors associated with authorization status. As shown, female gender remained significantly and negatively associated with MMAR status compared to No HC status (adjusted odds ratio [AOR]: 0.57; 95% CI: 0.35 – 0.93) and was also significantly and positively associated with MMPR status compared to MMAR status (AOR: 1.96: 95%

\(^3\) Responses for age had a non-normal distribution, therefore this variable was dichotomized by median age, ≥48 years and <48 years
CI: 1.03 – 3.70). Residence in British Columbia vs. Ontario remained significantly and negatively associated with MMPR status in comparison to No HC status (AOR: 0.31; 95% CI: 0.13-0.73) and MMAR status (AOR: 0.32; 95% CI: 0.14-0.75). Additionally, residence in the Atlantic provinces vs. Ontario was significantly and negatively associated with MMPR status in comparison to MMAR status (AOR: 0.26; 95% CI: 0.07-0.97).

3.3.2 Health-related factors associated with authorization status

The descriptive statistics of health-related factors stratified by authorization status are shown in Table 3.2. The most prevalent medical conditions reported by study participants were pain (72.1%), arthritis (44.2%) and mental health conditions (43.1%). Pain relief was the most common reason for medical cannabis use, reported by 90% of the sample, followed by sleep issues (69.4%), and mental health (63.1%). In addition, well-being was reported as a reason for use by over half the study participants (53.9%).

Table 3.3 presents the results of the bivariate analyses of health-related factors associated with authorization status. For medical conditions, mental health conditions were significantly and positively associated with MMPR status in comparison to MMAR status (OR: 2.16; 95% CI: 1.19 – 3.93), and significantly and negatively associated with MMAR status in comparison to No HC status (OR: 0.58; 95% CI: 0.37 – 0.92). Miscellaneous conditions were significantly and negatively associated MMAR status in comparison to No HC status (OR: 0.54; 95% CI: 0.33 - 0.91. In terms of reasons for use, pain relief was significantly and positively associated with MMAR
status compared to No HC status (OR: 2.13; 95% CI: 1.01-4.49), as was inflammation (OR: 2.26; 95% CI: 1.42-3.62).

Table 3.4 shows the results from the final multivariate analysis of medical conditions and reasons for use associated with authorization status. Mental health conditions remained significantly and positively associated with MMPR status in comparison to MMAR status (AOR: 2.40; 95% CI: 1.26 – 4.60). In addition, in this analysis, miscellaneous conditions were significantly and negatively associated with the MMPR group compared to the No HC group (AOR: 0.43; 95% CI: 0.19 – 0.97). Regarding reasons for use, the relationship between inflammation and authorization status persisted in the multivariate analyses: those with inflammation were 2.56 times more likely to have MMAR status than No HC status (AOR: 2.56; 95% CI: 1.57 - 4.17).

### 3.3.3 Quantity of use associated with authorization status

Table 3.5 shows the descriptive statistics and bivariate analyses for quantity of cannabis used stratified by authorization status. Overall, the median amount used per day by study participants was 2.5 grams of cannabis per day (g/day), with an interquartile range of 1-5 g/day. Most (78.3%) of the sample reported using less than or equal to 5 g/day. Those with MMAR status used the greatest amount of cannabis, and those with No HC status used the least. In bivariate analyses, use of greater than 2.5 g/day was significantly and positively associated with MMAR status (OR: 5.34; 95% CI: 3.23-8.82) and MMPR status (OR: 2.05; 95% CI: 1.07-3.90) compared to No HC status, and was significantly and negatively associated with MMPR status in comparison to MMAR status (OR: 0.38; 95% CI (0.21-0.70). Use of more than 5 grams/day was significantly and positively associated with MMAR status compared
to the No HC group (OR: 4.46; 95% CI: 2.32-8.58), and was significantly and negatively associated MMPR status compared to MMAR status (OR: 0.22; 95% CI: 0.09-0.54).

### 3.3.4 Modes of use associated with authorization status

Descriptive statistics and bivariate analyses of modes of medical cannabis use associated with authorization status are shown in Table 3.6. Inhalation of any kind (i.e., smoked, vaporized and inhaled concentrates) was reported by 94.3% of study participants. Smoked cannabis was the most common mode used (77.2%) followed by vaporizing and edibles, which were both reported by 66.4% of participants.

In bivariate analyses, smoked cannabis was significantly and negatively associated with MMPR status compared to No HC status (OR: 0.47; 95% CI: 0.23-0.94). Vaporizing was significantly and positively associated with MMAR status (OR: 2.07; 95% CI: 1.29-3.32) and MMPR status (OR: 2.37; 95% CI:1.20-4.68) compared to No HC status. Use of edibles was significantly and positively associated with MMAR status compared to No HC status (OR: 2.11; 95% CI: 1.31-3.42). Juicing, ingesting concentrates, tinctures and topicals were significantly and positively associated with MMAR status compared to both No HC status and MMPR status (See Table 3.6).

### 3.3.5 Problems experienced associated with authorization status

Table 3.7 shows the descriptive statistics and bivariate analyses pertaining to problems participants experienced with access to medical cannabis stratified by authorization status. In total, 85.1% of the participants reported experiencing some problems with gaining access to medical cannabis. Half the individuals across the authorization groups reported problems with obtaining necessary documentation for
accessing medical cannabis (50.9%). In addition, the cost of medical cannabis was reported as a problem by nearly half of the participants (48.2%).

Cost of medical cannabis was a problem that was significantly and positively associated with MMPR status compared to both MMAR status (OR: 2.70; 95% CI: 1.43-5.10) and No HC status (OR: 3.92; 95% CI: 2.02-7.62). Difficulty finding effective strains and products was associated significantly and positively with MMAR status (OR: 1.65; 95% CI: 1.04 – 2.62) and MMPR status (OR: 2.14; 95% CI: 1.15 – 4.00) compared to No HC status. Problems with availability of cannabis was significantly and positively associated with MMPR status compared to MMAR status (OR: 1.91; 95% CI: 1.03-3.47). Problems related to waiting time for registration was also significantly and positively associated with MMAR status (OR: 1.82; 95% CI: 1.07-3.11) and MMPR status (OR: 3.68 95% CI: 1.89-7.18) compared to No HC status. Waiting time for registration was a problem that was also significantly and positively associated with MMPR status compared to MMAR status (OR: 2.02; 95% CI: 1.01-3.69). Difficulties with waiting time to receive products was significantly and positively associated with MMAR and MMPR status compared to No HC status (OR: 2.06; 95% CI: 1.18-3.61 and OR: 2.56; 95% CI: 1.26- 5.20, respectively).

3.4 Discussion

To our knowledge, this is the first national study to assess and compare access to medical cannabis under the MMPR, the MMAR, and outside the federal regulations, from a patient-centred perspective. As summarized in Table 3.8, in this study it is demonstrated that authorization status differed according to a variety of sociodemographic, health-related, and patterns of use factors. In addition, specific problems related to accessing cannabis for medical purposes were associated with
authorization status. These patient- and system-related factors will be discussed below in the context of relevant literature and their potential impact on the various stages of access as outlined in Levesque’s model (see figure 1.2 and Table 3.9).

3.4.1 Sociodemographic factors

This study shows significant differences between authorization status in relation to gender and province of residence. With regard to gender, female participants in earlier studies of access to cannabis for medical purposes in Canada, the US, and Australia, were not equally represented (~30%) (Belle-Isle et al., 2014; Reiman, 2007, 2008; Reinarman et al., 2011; Swift et al., 2005; Walsh et al., 2013; Ware et al., 2005). In the current study the proportion of female participants, at 42.8%, was closer to the 50.7% proportion of the Canadian population who are female (Statistics Canada, 2017). A recent international online study of 1,429 individuals who self-identified as using cannabis for medical purposes reported similar gender proportions, with 45.4% of cannabis users in that study being female (Sexton, Cuttler, Finnell, & Mischley, 2016). While the increased proportion of female participants in these later studies may reflect sampling techniques, it may also reflect a shift in population use of cannabis, with increasing use by females. While not specifically assessing medical use of cannabis, a large population survey in Canada reported an increase in the prevalence of cannabis use among females, from 7% in 2013 to 10% 2015, with no concurrent increase for males (Government of Canada, 2017b). An increase in use of cannabis for medical purposes by females over the past decade might explain the significantly smaller proportion of females with MMAR status than those with MMPR status, given the later implementation of the MMPR. As cannabis becomes more accepted in society, as evidenced by the legalization of medical and
recreational use in various jurisdictions, societal values may also be changing, particularly for females who may be more risk averse and have been found to have lower positive acceptability attitudes toward cannabis (Byrnes, Miller, & Schafer, 1999; Kolar, Erickson, Hathaway, & Osborne, 2018). Likewise, the creation of commercial LPs under the MMPR may have contributed to the increased normalization of cannabis use for medical purposes, thus reducing stigma and allowing women to reframe cannabis as a possible treatment option. In Levesque’s model, such changes in values would facilitate female patients’ ability to seek care at the seeking stage of access.

The smaller proportion of females with MMAR status than MMPR status suggests that some of the barriers to accessing authorization under the MMAR, such as difficulties obtaining medical documentation and the lack of suitable options for acquiring cannabis (e.g., only one cannabis strain provided by the one legal supplier), may have been pronounced for women, and may have been ameliorated by the MMPR’s streamlined application process and new option for accessing cannabis from a number of LPs. These changes may have better accommodated women, thus facilitating access for them at the reaching stage in the Levesque model. It is further possible that outreach endeavours to women as a target market by some LPs (Harrison, 2015; Szklarski, 2018) may have increased their perceived approachability by females, and in turn, increased their desire to access cannabis from this source through the legal program (i.e., perception of need and desire for care stage of access). It is instructive to note the significantly smaller proportion of females with MMAR status than those with No HC status, and the lower (although not significant) proportion of females with MMPR status than No HC status, suggesting that there
may be fewer barriers to accessing cannabis for medical purposes for females outside the legal cannabis program, where the prevalence of male and female participants was approximately equal.

With respect to province of residence, the results suggest an early uptake of MMPR in Ontario, particularly compared to British Columbia and the Atlantic provinces. Geographic distribution of LPs and dispensaries may explain the present finding that compared to Ontario, significantly fewer participants residing in British Columbia had MMPR status than MMAR or No HC status. At the time of data collection, most of the LPs were situated in Ontario; 10 of the 21 LPs were in Ontario, and 6 were in British Columbia. As of April 2018, there were 92 LPs, and 53 were located in Ontario, and 21 in British Columbia (Health Canada, 2018b). On the other hand, medical cannabis dispensaries (i.e., dispensaries), which offer another, albeit illegal, option for accessing cannabis for medical purposes outside the MMPR and MMAR, were more prolific in British Columbia than Ontario at the time of the survey (City of Vancouver, 2015; Keller, 2016). Previous research in Canada reported a higher proportion of study participants who accessed cannabis for medical purposes from dispensaries resided in British Columbia (70%) compared to Ontario (41%) (Belle-Ise et al., 2014). Although LPs can ship product across Canada, it is possible that individuals using cannabis for medical purpose prefer to access cannabis from locally situated sources (i.e., LPs in Ontario and dispensaries in British Columbia). Proximity is considered an important factor for access to healthcare services, including pharmacies (Hiscock, Pearce, Blakely, & Witten, 2008; Law et al., 2013; Law, Dijkstra, Douillard, Jay, & Morgan, Steven, 2011). More generally, studies have also demonstrated consumer ethnocentrism and a “region of origin effect” for local and
home province agricultural products, including foods and wines (Chamorro, Rubio, & Miranda, 2015; Cranfield, Henson, & Blandon, 2012; Lim & Hu, 2016). In relation to the Levesque model, individuals could be more aware of local options for accessing cannabis for medical purposes, which would impact the perception of needs and desire for care stage of access. In addition, the social values and norms in British Columbia, which include a strong presence of and support for local cannabis production and sales (Angus Reid Institute, 2017; Craft Cannabis Association of British Columbia, 2016) may have hindered access under the MMPR at the seeking stage; the MMPR only provided access through LPs, which did not conform to those values. The comparatively early uptake of the MMPR in Ontario might also be explained by the geographic location of clinics providing medical documentation required for patients to access cannabis through LPs, which had begun to flourish in Ontario alongside the implementation of the MMPR (Goffin, 2014). The location of clinics may thus have facilitated access to the MMPR for residents of Ontario at the seeking stage of access in terms of obtaining documentation, and reaching stage in terms of being able to attend in-person appointments with health care practitioners.

Authorization status was not associated with any other sociodemographic factors including age, ethnicity, urban or rural residence, income, employment or education, suggesting that such factors may have less impact on the process of accessing legal authorization status than gender and geographical location in Canada. However, a previous study of individuals using cannabis for medical purposes in Canada reported those with lower income were more likely to be authorized under the MMAR than those with higher income (Belle-Isle et al., 2014). The difference in these study results may reflect the fact that at the time of the present study, the MMAR
was being phased out, and there may have been less incentive for lower income individuals to pursue authorization in the absence of the more affordable options it had provided for legal sources of cannabis (i.e., personal and designated production). Likewise, a previous study had reported a positive association between authorization through the MMAR and residence in rural areas, with rural residents reporting the highest level of self-production (Belle-Isle et al., 2014). Given that the option for legal personal production was being phased out at the time of the current study, legal authorization may have become less appealing for rural residents than it was previously, also diminishing access at the perception of need and desire for care stage.

3.4.2 Health-related factors

In this study, chronic pain, arthritis and mental health conditions were the most common reported medical conditions reported by users of cannabis for medical purposes; pain, sleep and mental health were the common reasons (i.e., symptoms) they reported for using cannabis. This finding corroborates previous studies in Canada (Walsh et al., 2013), and research in the USA and international jurisdictions that have also reported pain and mental health to be among the top medical conditions reported by people who use cannabis for medical purposes (Bonn-Miller et al., 2014; Reinarman et al., 2011; Sexton et al., 2016). Although it is possible that the high prevalence of individuals with pain conditions and symptoms in the current study may reflect bias in recruitment methods whereby participants were oversampled through several pain-specific patient organizations, the common findings from these other studies suggest that these results are not merely a reflection of sampling. A patient’s medical conditions and symptoms would impact the needs stage of access.
With regard to the associations between authorization status and health-related factors, a previous study conducted before the MMPR came into effect reported substantial similarities between authorized and unauthorized medical cannabis users in regard to health status (Walsh et al., 2013). Likewise, few significant differences emerged in the present study in relation to health-related factors between those with No HC status and those with MMAR or MMPR status. Of note, a significantly higher prevalence of participants with MMAR status were using cannabis to address inflammation than those with No HC status. This could be a reflection of the historically high prevalence of individuals with arthritis in the MMAR program (65%) (Arthritis Society, 2016), suggesting easier access to authorization for this medical condition. Such access may be due to physician and community interest in cannabis as a treatment option for ameliorating the inflammation associated with arthritis given the limited therapy alternatives available (Fitzcharles et al., 2016). In addition, because arthritis was listed as a qualifying condition for authorization in the MMAR, this may have provided an avenue of access that was perhaps exploited by some patients and physicians (Ste-Marie et al., 2016). Conversely, miscellaneous medical conditions were more prevalent for those with No HC status than those with MMPR status, suggesting obtaining medical documents necessary for authorization from physicians has been more difficult for individuals living with these conditions. Alternately, individuals with miscellaneous conditions may not believe they would qualify for authorization for cannabis use under Health Canada’s regulations, and thus choose not to attempt to attain authorization. Additionally, the lack of research funding for the medical use of cannabis more generally, and especially for less prevalent conditions, may make it more difficult to obtain the necessary evidence to identify these conditions as qualifying for authorization for cannabis use. This may
change in the future, however, as some LPs are funding research for the use of cannabis in the treatment of less prominent conditions, such as PTSD (Tilray, 2016). The perceived acceptability of medical cannabis use for certain conditions by healthcare practitioners and patients would impact access at the seeking stage.

In terms of differences in health-related factors between individuals with MMAR status and those with MMPR status, a significantly higher prevalence of individuals with mental health conditions had MMPR status than MMAR status. This suggests that there may have been an unmet need for legal access to cannabis for medical purposes for individuals with mental health conditions under the MMAR, and that access may be improving under the MMPR. Previous research undertaken in Canada, prior to the MMPR coming into effect, reported that individuals with mental health conditions were less likely to be authorized under the MMAR than those with other conditions, suggesting historical barriers to legally accessing cannabis for mental health conditions (Walsh et al., 2013). Possible barriers included the MMAR’s requirement for a consultation with an additional healthcare practitioner for conditions that were not explicitly listed in the regulations, including mental health conditions. The stigma associated with mental health conditions may be compounded by the stigma related to the use of cannabis (Bottorff et al., 2013; Walsh et al., 2013). Additionally, physicians may have concerns around dual diagnosis of mental health and addictions, as well as possible risks of cannabis use for people with serious mental health conditions, such as bi-polar disorder and schizophrenia (Charuvastra et al., 2005; Crippa et al., 2009; Ebert et al., 2015; Grant, Atkinson, Gouaux, & Wilsey, 2012; Kondrad & Reid, 2013; Moore et al., 2007). Such professional opinions would create further barriers to accessing legal authorization for people living with these conditions.
conditions in terms of obtaining the required medical documents. Requirements under the MMPR did not necessitate an additional medical consultation for any medical conditions, making the application process less onerous, possibly facilitating the reaching stage of access for those with mental health conditions. Additionally, more recent research illustrating the high prevalence of cannabis use for mental health conditions and the possible salutary effects of CBD and various terpenoids (Abramovici, 2013; Aggarwal et al., 2009; Bottorff, Bissell, et al., 2011; Crippa et al., 2011; Hazekamp et al., 2013; Lucas, 2012; Morgan & Curran, 2008; Reinarman et al., 2011; Russo, 2011; Schubart et al., 2011; Walsh et al., 2013, 2017) may have increased the perception of the relevance of cannabis for the treatment of these conditions after the implementation of the MMPR. Further, more recent research on the perceived efficacy and prevalent use of cannabis in the context of mental health (Belle-Isle et al., 2014; Bottorff, Bissell, et al., 2011; Walsh et al., 2013) may have reduced stigma for healthcare providers and patients alike, facilitating both the perception of needs and seeking stages of access under the MMPR.

3.4.3 Patterns of use factors

In relation to the amount of cannabis used, individuals with MMAR status used a significantly larger amount of cannabis than other study participants, and those with No HC status used significantly less than others. These findings coincide with Health Canada data, which reported larger average amounts of grams/day authorized by physicians for their patients under the MMAR vs. the MMPR (i.e., 8 grams vs. 4 grams/day) (Health Canada, 2017b; Stambrook et al., 2012). The amounts of cannabis use reported in that study are substantiated by the average daily amounts indicated by patients with respective authorization status in the current study (i.e. 8.31
grams/day vs. 3.81 grams/day). The amount of cannabis authorized by physicians under the MMPR continued to drop over time, and by March 31, 2017 under the ACMPR it was reported as 2.4 gram/day (Health Canada, 2017b). The average daily amount used by individuals with No HC status in the current study (i.e., 2.67 grams/day) also concurs with previous studies, which have reported that individuals using cannabis for medical purposes report using between 1-3 grams/day (Abramovici, 2013). However, a more recent survey by the government of Canada reported that the average daily amount reported by medical users of cannabis was 1.4 grams (Government of Canada, 2017a).

Due to the cross-sectional nature of the data, we were not able to determine the direction of the associations found between the amount of cannabis used and authorization status. The higher levels of medical cannabis use reported by individuals with MMAR status in the present study might be related to cost, since this group had access to a supply of cannabis at a lower cost through personal and designated production, increasing affordability of larger amounts of cannabis. Indeed, the ability to produce their own cannabis, and the resulting affordability, may have attracted these individuals to pursue authorization through this program, impacting the perception of need and desire for care stage of access. It is also possible that the greater quantities used by those with MMAR status may represent actual amounts needed by patients, and those with MMPR status or No HC status were perhaps being under-served due to lack of affordability, thus impacting access at the utilization stage of access for these individuals. Alternatively, the increased affordability of cannabis under the MMAR may have led to levels of use beyond medical need. It must be noted that government and industry data does not account for other sources of cannabis
being accessed by individuals authorized under the legal program, and thus may not reflect actual amounts used by patients, highlighting the importance of patient-centred research to gain a better understanding of their experiences.

Regarding modes of use, as reported in other studies (Cranford, Bohnert, Perron, Bourque, & Ilgen, 2016; Government of Canada, 2017a; Hazekamp et al., 2013; Reinarman et al., 2011; Sexton et al., 2016; Swift et al., 2005; Walsh et al., 2013; Ware et al., 2005), smoking was the most common mode of cannabis use among the current study’s participants, with vaporizing and edibles also commonly used routes of administration. The finding that individuals with MMAR and MMPR status vaporized significantly more than those with No HC status may be a result of encouragement by the healthcare practitioners providing medical documentation under these regulations to use vaporization, which is considered safer than other modes of use (i.e., smoking) (Cannabinoid Medical Clinic, 2017; Earleywine & Barnwell, 2007; Greenleaf Medical Clinic, 2017). It should be noted that although vaporizing is considered safer than smoking, there are some potential risks related to this mode of use, particularly with oil thinning agents (Troutt & DiDonato, 2017). LPs may also be providing individuals with MMPR status education about vaporizers and opportunities to purchase them (Cannimed, 2017; Harrison, 2016). A connection between vaporizing and medical cannabis programs was corroborated by Borodovsky et al. (2016), in their study of 2,838 individuals living in the USA who had used cannabis at least once in their lifetime. That study reported individuals residing in states with medical cannabis laws had a significantly higher likelihood of ever vaporizing, and that states with longer-standing legal status for medical cannabis and higher dispensary density were also significantly associated with the use of
vaporizing and consumption of edibles (Borodovsky, Crosier, Lee, Sargent, & Budney, 2016).

In the current study, the use of non-inhalation modes, such as edibles, tinctures, juicing and topicals, were more prevalent for individuals with MMAR status than either MMPR or No HC status. These modes were not legally available from either Health Canada’s contracted supplier or designated producers under the MMAR, or from LPs under the MMPR at the time of this study. Individuals thus would have to produce their own products, or find them outside of the legal program. The availability of these products at dispensaries may in part explain the high prevalence of individuals with MMAR status using this source of cannabis, which ranged from 50-80% in previous studies (Belle-Isle et al., 2014; Lucas, 2012; Walsh et al., 2013), and approximately 30% in this study, as described further in Chapter 4. Additionally, given that these modes of use often require a large amount of cannabis, they may have been more affordable for those with MMAR status due to lower costs of cannabis through the legal sources associated with the MMAR (i.e., personal and designated production). Likewise, these modes may have been more accessible to those with MMAR status due to proximity to production of cannabis plants and raw material, like leaves and ‘shake’ (the small pieces of cannabis flower that break off larger pieces), which are often used to make these products. The MMAR might have, therefore, been more desirable to individuals who prefer to use these modes of administration and provided a motivation for their decision to pursue legal authorization, impacting the perception of need and desire for care stage of access. Alternatively, it is possible that those with MMAR status may have had more awareness of these modes of use through online MMAR patient networks, where such
information is shared (Medical Marijuana Alliance and Resources, 2017). Since this study’s survey data collection, the Supreme Court of Canada ruled that medical cannabis should be legal in all forms and Health Canada has allowed LPs to produce and sell cannabis-infused oils, and fresh cannabis buds and leaves, in addition to dried cannabis (R. v. Smith, 2015). A study of Dutch patients accessing medical cannabis through the government program reported an increase in participation after the introduction of cannabis oils (de Hoop et al., 2018). Future research will be needed to determine if the availability of these products through LPs will catalyze desire to gain authorization under the ACMPR.

### 3.4.4 Access problems experienced

Results from the current study concur with previous research on access to cannabis for medical purposes in Canada, which reported 86% of study participants, including those who were accessing cannabis under the MMAR and those who were not authorized, experienced problems accessing cannabis for medical purposes (Belle-Isle et al., 2014). The main barriers reported in that study were lack of physician support, affordability and access to a legal supply. These problems were also demonstrated in the present study. Over half of all participants in the current study experienced problems obtaining required medical documentation from their healthcare practitioner, pointing to a systemic issue regarding healthcare practitioners’ lack of support for access to cannabis for medical purposes, creating a barrier at the seeking stage of access. In fact, for participants with No HC status, the most common reason for not enrolling in Health Canada’s medical cannabis program was healthcare practitioners not providing necessary medical documents, indicated by 54.5% of this group (data not presented in tables). This issue has also been
identified in previous studies (Bottorff et al., 2013; Jones & Hathaway, 2008; Lucas, 2012). Statements from physician organizations have expressed concern about their gatekeeping role, which continued under the MMPR and ACMPR (Canadian Medical Association, 2013; Canadian Medical Association, 2011, 2016; College of Family Physicians of Canada, 2013; Federation of Medical Regulatory Authorities of Canada, 2013). This barrier to access does not appear to have been addressed by the MMPR at the time of this study; individuals with MMPR status and MMAR status did not differ with respect to experiencing problems obtaining documentation. This lack of support from healthcare practitioners may be ameliorated through efforts to develop resources and educational programs to support clinicians in this area, addressing their concerns and knowledge gaps (Balneaves, Alraja, Ziemianski, McCuaig, & Ware, 2018; Ware & Ziemianski, 2015; Ziemianski et al., 2015).

Another related barrier to obtaining documentation from healthcare practitioners is the associated cost, resulting from some physicians and clinics charging fees to patients. Almost a third of participants in the current study experienced problems regarding the cost of documentation, with amounts charged ranging from $30-$800 (data not presented in tables). In their study of access to cannabis under the MMAR, Belle-Isle et al. (2014) reported similar results: 40% of MMAR applicants were charged by physicians for the service of having their application completed, with charges ranging from $10 to $800. Some provincial colleges of physicians and surgeons have stated that physicians must not charge fees to patients associated with providing documentation for access to cannabis for medical purposes (College of Physicians and Surgeons of British Columbia, 2016; College of Physicians and Surgeons of Ontario, 2015). While the absence of fees would
promote equity for those with lower income levels, it is unclear whether this would improve access to documentation overall, since these fees may be an incentive for physicians to provide documentation.

Cost of cannabis was also a problem for almost half of participants in the present study; however, those with MMPR status experienced significantly more difficulties with cost than those with MMAR status and No HC status, creating a barrier at the utilization stage of access. This finding corresponds with earlier predictions that cost for patients would be higher under the MMPR, and would impede access (Stambrook et al., 2012). A court proceeding, published after the current study was conducted, determined that the MMPR did not provide affordable options for cannabis such as those provided under the MMAR through personal and designated production, and ordered amendments be made to the regulations to address affordability (Allard et al. v. Canada, 2016). As a result, in August 2016, the ACMPR was published and reintroduced patient and caregiver production of cannabis (Government of Canada, 2016). Future research should assess whether difficulties with cost of cannabis continue under the ACMPR, given these changes.

Finding effective cannabis strains and products was a problem for 44% of participants in the present study, particularly for those with MMPR and MMAR status. Those with MMPR status also had significantly more difficulties with availability of medical cannabis. As noted above, at the time of this study, the MMPR did not allow for products beyond dried cannabis. In addition, LPs had not yet developed a variety of strains in sufficient quantities to allow for consistent availability. Further, individuals with both MMAR and MMPR status experienced significantly more problems with waiting time to receive products than those with No
HC status. This difference may be related to the sources of cannabis used by those with No HC status, including dispensaries and friends/family (Capler, Walsh, et al., 2017; Pogue, 2015; Walsh et al., 2013). These sources often provide immediate access, in contrast to the legal sources which require producing one’s own product or having it supplied through the mail. While these problems are more directly related to accessing a legal source of cannabis than accessing authorization, per se, these problems, as well as cost of cannabis, may deter individuals from seeking legal authorization due to the lack of desirability of the products and services offered by legal sources, impacting access to authorization by creating barriers at the perception of need and desire for care stage of access. Those with MMAR and MMPR status also experienced more difficulties with waiting time for registration than those with No HC status. For the MMPR in particular, this may reflect the fact that in the early stages of the MMPR, most of the LPs were not accepting new patients because they did not have sufficient amount of product available for sale (Hutchinson, 2014; Sookochoff, 2014), obstructing the reaching stage of access. Future research will be needed to determine whether these problems have been sufficiently addressed under the ACMPR to improve access.

3.4.5 Implications and limitations

Individuals authorized by Health Canada to use cannabis for medical purposes under the MMAR and MMPR did not differ greatly from those not authorized in terms of sociodemographic or health-related factors. This finding suggests that there are other social or structural factors, related to individuals’ abilities and system attributes, that must be addressed in order to ensure reasonable access to cannabis for medical purposes. Some of these factors were identified in this study, and have
specific implications for programs, policies, and research related to the use of cannabis for medical purposes in Canada.

First, problems experienced by those in Health Canada’s program, including cost, availability of effective strains and products, availability of cannabis, and waiting time to receive products and for registration, reflect issues with the program’s implementation and execution. Problems with availability of cannabis and waiting time for registration for those in the MMPR appear to reflect the early stages of LP operations in Canada. The lower amount of cannabis use for those in the MMPR may also be related to problems with cost and availability of cannabis, and to problems finding effective strains and products. Although it might be expected that improvements will be made over time, LPs were the only source of legal access for many patients for a period of at least nine months, and the lack of access could have had substantial implications for the lives of those using cannabis for medical purposes, particularly in terms health, legal and financial outcomes, impacting the consequences stage of access. Implementation plans for amended or new regulations must be considered carefully in the future so that reasonable access is not impeded during transition periods. Regulations as well as sources also appear to have the ability to promote different modes of use, such as vaporizing or edibles, which may also become more widespread once they are offered through the program. If those modes are desired by patients, such program changes may impact access at the perceived need and desired for care stage, and if they are effective for symptoms and cost-effective, could also impact access at the consequences stage, and should be monitored regularly.
Second, in relation to policy, the cost of cannabis offered through the legal cannabis program is an important factor affecting the utilization, and consequences (i.e., health outcomes) stages of access if a patient cannot afford sufficient amounts of cannabis to address their needs. Cost may also affect the perception of need and desire for care stage of access, since high prices may be a disincentive to seek authorization through the program. The issue of affordability must be addressed for reasonable access to be realized. While prices are currently set by cannabis providers, cost can be addressed directly through policy (i.e., price setting), or indirectly by licensing more LPs to increase competition. Policies supporting cost coverage through provincial and private insurance, and removal of taxation, as patients have advocated, can also help address this important barrier to access (Canadians for Fair Access to Medical Marijuana, 2016). Regulations limiting the quantity of cannabis individuals are permitted to purchase, and the types of products available, should also be examined in view of how they may affect reasonable access. Additionally, restrictive or cost-prohibitive regulatory requirements limiting the number of LPs in different provinces and territories may impact regional access to the legal program. Regulations that support the inclusion of smaller local producers, particularly in British Columbia and Nova Scotia, may increase access to the legal program for individuals living in these regions. The proposed regulations for the legalization of recreational cannabis include a “micro-producer” category that may have implications for the medical program in this regard (Health Canada, 2018d).

There are various research implications arising from the findings. Greater understanding is needed regarding cannabis use in the treatment of health conditions to address stigma and lack of knowledge by healthcare professionals. Such
understanding is particularly needed for mental health conditions, including anxiety and depression, and for conditions beyond those typically associated with medical cannabis use (i.e., arthritis, cancer, etc.). The development of standardized categories of medical conditions would help compare findings across studies examining factors related to use of, and legal authorization for, cannabis for medical purposes. Further, research on amounts of cannabis used for medical purposes should consider data from the different sources accessed and include assessment of whether needs were met. Additionally, despite the emphasis on the importance of having access to specific strains of cannabis, there is a lack of research indicating the specific strains and concentrations that best address specific symptoms and conditions. Such an understanding would allow patients and providers to capitalize on the personalized medicine potential of cannabis (Lazary, Juhasz, Hunyady, & Bagdy, 2011). Additionally, the relative safety and efficacy of different modes of use for different symptoms and medical conditions should be assessed further, to ensure the best possible products are available legally and their use incentivized. More generally, it is important for future research on access to cannabis for medical purposes to assess relevant patient- and system-related factors from a patient-centred perspective. Finally, in terms of reach design, a prospective cohort study is needed to capture future changes to regulations that might impact reasonable access to cannabis for medical purposes in Canada.

This study has several limitations. As a cross-sectional study, it provides a view of only one point in time, and causal or temporal relationships between the outcome and explanatory variables cannot be assessed. This study involved multiple statistical comparisons, and while many factors were found to reach statistical significance at  \( p \)
<.05 and \( p < .01 \), it is possible that some of these may have occurred by chance. Further, the study sample was not randomly selected and, therefore, may not be fully representative of the Canadian population accessing or eligible for cannabis for medical purposes. For example, compared to the Canadian population, there was an under-representation of Quebec residents in this study. Recruitment was also done through organizations that focused on certain medical conditions (e.g., pain), which may have led to an over-representation of these health conditions in the present study. However, the distribution of province of residence and medical conditions in this sample was consistent with other studies of medical cannabis use in Canada. The recruitment of participants through certain points of access (e.g., dispensaries and LPs) and the use of an online survey to collect data may also have led to a selection effect. For example, individuals with lower socioeconomic status who may not have had access to computers and the Internet, or those with lower computer literacy (i.e., the elderly), may not have been included in the sample. In addition, since there were few LPs in operation at the time of this study, there was a smaller number of people in Canada authorized under the MMPR relative to the MMAR. As a result, there is less representation from this group; however, the numbers were sufficient for the purposes of the analysis.

Another potential limitation was the lack of physician-confirmed diagnoses; instead, medical conditions were self-reported by study participants. Likewise, we did not require confirmation of authorization status for participants reporting accessing cannabis under the MMAR or MMPR. In addition, with respect to problems experienced in accessing cannabis, given that participants were asked if they ‘ever’ experienced these problems, it is possible that the problems indicated may have been
related to a previous authorization status rather than their current authorization status. For example, an individual with MMPR authorization status may have previously had MMAR status or No HC status, and their response could reflect a problem they experienced in relation to that status. It should also be acknowledged that at the time of the study, new entrants to the legal medical cannabis program were unable to choose to be part of the MMAR; any associations found in relation to authorization status must be interpreted accordingly. Overall, these study limitations require us to interpret with caution the associations between patient- and system-related factors and authorization status, pending replication in studies that employ a more systematic recruitment approach and confirmation of diagnosis. It is also possible that unmeasured factors may have played an important role in determining individuals’ authorization status. Since this analysis did not include individuals who were not currently using cannabis for medical purposes, it is also possible that the experiences accessing cannabis reported in this study are not reflective the experiences of individuals who stopped using cannabis for medical purposes, which may be instructive with regards to possible barriers to reasonable access. This study has several methodological strengths, including the involvement of community and academic experts in the development of the survey, detailed queries of cannabis use and access, the examination of factors related to authorization status that were identified in previous research, general adherence to standards for reporting Internet-based surveys (Eysenbach, 2004), and the use of a patient-centred theoretical framework of access to health care.

In sum, this study found many similarities between those individuals who were authorized to use cannabis for medical purposes and those not authorized,
suggesting that there were barriers to legal authorization for access to cannabis for medical purposes in Canada at the time of the current study. The differences that did emerge between authorization groups imply various systemic and regulatory barriers to accessing cannabis for medical purposes that are disproportionately experienced by individuals from different sociodemographic groups and with different medical conditions and symptoms, despite similar health care needs. Females, residents of British Columbia and the Atlantic provinces, and those with mental health and miscellaneous conditions appear to have experienced more barriers to accessing legal authorization to cannabis for medical purposes under the MMPR. Differences in patterns of use that emerged across authorization status suggest that different regulations may permit, or promote, different amounts and modes of cannabis use, and be better suited to different individuals’ preferences and needs. Legal authorization was also associated with barriers related to cost, finding effective strains and products, availability of strains, and waiting time to receive product and for registration in the program. These problems present both direct barriers to legal authorization (i.e., waiting time for registration), and other constraints that may be deterring individuals from seeking authorization. While some of the factors identified in this study have been addressed through court challenges since the time of the study, and LPs have had the opportunity to expand their operations and scope of services, this study points to some key factors that must be taken into account to ensure reasonable access is achieved. Industry data alone is not sufficient to assess the impact of regulations on patient access; future research should use a patient-centred approach to monitor the impacts of changes to regulations on patients’ experiences of access to cannabis for medical purposes, and consider how they may facilitate or impede the various stages of access. Such monitoring of regulatory changes should
occur at regular and short-term intervals, so that amendments can be responsive to patients’ needs and reasonable access can be achieved, thus preventing the suffering of patients, threats to their liberty, and costly court cases.
### Table 3.1 Descriptive statistics of sociodemographic factors stratified by authorization status (n=369)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No HC</th>
<th>MMAR</th>
<th>MMPR</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td><strong>n = 132</strong></td>
<td>n = 178</td>
<td>n = 59</td>
<td>369 (100)</td>
<td></td>
</tr>
<tr>
<td><strong>Sociodemographic factors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Median age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥48 years</td>
<td>72 (54.5)</td>
<td>95 (53.4)</td>
<td>28 (47.5)</td>
<td>195 (52.8)</td>
</tr>
<tr>
<td>&lt;48 years</td>
<td>60 (45.4)</td>
<td>83 (46.6)</td>
<td>31 (52.5)</td>
<td>197 (47.2)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>female</td>
<td>67 (50.8)</td>
<td>63 (35.4)</td>
<td>28 (47.5)</td>
<td>158 (42.8)</td>
</tr>
<tr>
<td>male</td>
<td>65 (49.2)</td>
<td>115 (64.6)</td>
<td>31 (52.5)</td>
<td>211 (57.2)</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>110 (83.3)</td>
<td>154 (86.5)</td>
<td>49 (83.1)</td>
<td>313 (84.8)</td>
</tr>
<tr>
<td>other</td>
<td>22 (16.7)</td>
<td>24 (13.5)</td>
<td>10 (16.9)</td>
<td>56 (15.2)</td>
</tr>
<tr>
<td><strong>Residence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sub/urban</td>
<td>104 (78.8)</td>
<td>125 (70.2)</td>
<td>46 (78.0)</td>
<td>275 (74.5)</td>
</tr>
<tr>
<td>rural</td>
<td>28 (21.2)</td>
<td>53 (29.8)</td>
<td>13 (22.0)</td>
<td>94 (25.5)</td>
</tr>
<tr>
<td><strong>Province</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ontario</td>
<td>46 (34.8)</td>
<td>62 (34.8)</td>
<td>30 (50.8)</td>
<td>138 (37.4)</td>
</tr>
<tr>
<td>British</td>
<td>47 (35.6)</td>
<td>58 (32.6)</td>
<td>9 (15.3)</td>
<td>114 (30.9)</td>
</tr>
<tr>
<td>Prairie</td>
<td>16 (12.1)</td>
<td>27 (15.2)</td>
<td>14 (23.7)</td>
<td>57 (15.4)</td>
</tr>
<tr>
<td>Quebec</td>
<td>12 (9.1)</td>
<td>9 (5.1)</td>
<td>3 (5.1)</td>
<td>24 (6.5)</td>
</tr>
<tr>
<td>Atlantic</td>
<td>11 (8.3)</td>
<td>22 (12.4)</td>
<td>3 (5.1)</td>
<td>36 (9.8)</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥$20,000</td>
<td>82 (62.1)</td>
<td>127 (71.3)</td>
<td>37 (62.7)</td>
<td>246 (66.7)</td>
</tr>
<tr>
<td>&lt;$20,000</td>
<td>50 (37.9)</td>
<td>51 (28.7)</td>
<td>22 (37.3)</td>
<td>123 (33.3)</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>employed*</td>
<td>51 (38.6)</td>
<td>67 (37.6)</td>
<td>23 (39.0)</td>
<td>141 (38.2)</td>
</tr>
<tr>
<td>other</td>
<td>81 (61.4)</td>
<td>111 (62.4)</td>
<td>36 (61.0)</td>
<td>228 (61.8)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥post-secondary</td>
<td>96 (72.7)</td>
<td>136 (76.4)</td>
<td>43 (72.9)</td>
<td>275 (74.5)</td>
</tr>
<tr>
<td>&lt;post-secondary</td>
<td>36 (27.3)</td>
<td>42 (23.6)</td>
<td>16 (27.1)</td>
<td>94 (25.5)</td>
</tr>
</tbody>
</table>

No HC: No Health Canada; MMAR: Marihuana Medical Access Regulations; MMPR: Marihuana for Medical Purposes Regulations

* employed includes: full-time, part-time, casual, and self-employment
Table 3.2 Descriptive statistics of health-related factors stratified by authorization status (n=369)*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No HC  n (%)</th>
<th>MMAR n (%)</th>
<th>MMPR n (%)</th>
<th>Total n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 132</td>
<td>n = 178</td>
<td>n = 59</td>
<td>369 (100)</td>
</tr>
<tr>
<td><strong>Medical conditions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>99 (75.0)</td>
<td>128 (71.9)</td>
<td>39 (66.1)</td>
<td>266 (72.1)</td>
</tr>
<tr>
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<td>50 (28.1)</td>
<td>20 (33.9)</td>
<td>103 (27.9)</td>
</tr>
<tr>
<td>Arthritis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
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<td>78 (43.8)</td>
<td>25 (42.4)</td>
<td>163 (44.2)</td>
</tr>
<tr>
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<td>100 (56.2)</td>
<td>34 (57.6)</td>
<td>206 (55.8)</td>
</tr>
<tr>
<td>Mental health</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>64 (48.5)</td>
<td>63 (35.4)</td>
<td>32 (54.2)</td>
<td>159 (43.1)</td>
</tr>
<tr>
<td>no</td>
<td>68 (51.5)</td>
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<td>27 (45.8)</td>
<td>210 (56.9)</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>37 (20.8)</td>
<td>11 (18.6)</td>
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<tr>
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<td>48 (81.4)</td>
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</tr>
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<td>75 (20.3)</td>
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<tr>
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<td>294 (79.6)</td>
</tr>
<tr>
<td>Nervous system</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>26 (19.7)</td>
<td>37 (20.8)</td>
<td>9 (15.3)</td>
<td>72 (19.5)</td>
</tr>
<tr>
<td>no</td>
<td>106 (80.3)</td>
<td>141 (79.2)</td>
<td>50 (84.7)</td>
<td>297 (80.5)</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
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<td>30 (16.9)</td>
<td>11 (18.6)</td>
<td>62 (16.8)</td>
</tr>
<tr>
<td>no</td>
<td>111 (84.1)</td>
<td>148 (83.1)</td>
<td>48 (81.4)</td>
<td>307 (83.2)</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>27 (20.5)</td>
<td>25 (14.0)</td>
<td>9 (15.3)</td>
<td>61 (16.5)</td>
</tr>
<tr>
<td>no</td>
<td>105 (79.5)</td>
<td>153 (86.0)</td>
<td>50 (84.7)</td>
<td>308 (83.5)</td>
</tr>
<tr>
<td>Endocrine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>23 (17.4)</td>
<td>22 (12.4)</td>
<td>6 (10.2)</td>
<td>51 (13.8)</td>
</tr>
<tr>
<td>no</td>
<td>109 (82.6)</td>
<td>156 (87.6)</td>
<td>53 (89.8)</td>
<td>318 (86.2)</td>
</tr>
<tr>
<td>Cancer</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>yes</td>
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<td>10 (5.6)</td>
<td>6 (10.2)</td>
<td>26 (7.0)</td>
</tr>
<tr>
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<td>168 (94.4)</td>
<td>53 (89.8)</td>
<td>343 (93.0)</td>
</tr>
<tr>
<td>HIV/AIDS</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>0 (0.0)</td>
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<tr>
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<td>124 (93.9)</td>
<td>167 (93.8)</td>
<td>59 (100.0)</td>
<td>350 (94.9)</td>
</tr>
</tbody>
</table>

*No HC: No Health Canada; MMAR: Marihuana Medical Access Regulations; MMPR: Marihuana for Medical Purposes Regulations
* respondents were able to select more than one medical condition and reason for use
Table 3.2 Descriptive statistics of health-related factors stratified by authorization status (n=369)* (continued)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No HC n (%)</th>
<th>MMAR n (%)</th>
<th>MMPR n (%)</th>
<th>Total n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n = 132</td>
<td>n = 178</td>
<td>n = 59</td>
<td></td>
<td>369 (100)</td>
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</table>

**Reasons for use**

<table>
<thead>
<tr>
<th>Pain relief</th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
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<td>165 (92.7)</td>
<td>54 (91.5)</td>
<td>332 (90.0)</td>
</tr>
<tr>
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<td>19 (14.4)</td>
<td>13 (7.3)</td>
<td>5 (8.5)</td>
<td>37 (10.0)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Sleep</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>93 (70.5)</td>
<td>124 (69.7)</td>
<td>39 (66.1)</td>
<td>256 (69.4)</td>
</tr>
<tr>
<td>no</td>
<td>39 (29.5)</td>
<td>54 (30.3)</td>
<td>20 (33.9)</td>
<td>113 (30.6)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Mental health</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>89 (67.4)</td>
<td>106 (59.6)</td>
<td>38 (64.4)</td>
<td>233 (63.1)</td>
</tr>
<tr>
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<td>72 (40.4)</td>
<td>21 (35.6)</td>
<td>136 (36.9)</td>
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</table>

<table>
<thead>
<tr>
<th>Well-being</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
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<td>96 (53.9)</td>
<td>32 (54.2)</td>
<td>199 (53.9)</td>
</tr>
<tr>
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<td>61 (46.2)</td>
<td>82 (46.1)</td>
<td>27 (45.8)</td>
<td>170 (46.1)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Nausea &amp; vomiting</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>62 (47.0)</td>
<td>86 (48.3)</td>
<td>30 (50.8)</td>
<td>178 (48.2)</td>
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<tr>
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<td>70 (53.0)</td>
<td>92 (51.7)</td>
<td>29 (49.2)</td>
<td>191 (51.8)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Inflammation</th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
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<td>93 (52.2)</td>
<td>24 (40.7)</td>
<td>160 (43.4)</td>
</tr>
<tr>
<td>no</td>
<td>89 (67.4)</td>
<td>85 (47.8)</td>
<td>35 (59.3)</td>
<td>209 (56.6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Loss of appetite &amp; weight loss</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>56 (42.4)</td>
<td>73 (41.0)</td>
<td>20 (33.9)</td>
<td>149 (40.4)</td>
</tr>
<tr>
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<td>76 (57.6)</td>
<td>105 (59.0)</td>
<td>39 (66.1)</td>
<td>220 (59.6)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Miscellaneous</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>21 (15.9)</td>
<td>22 (12.4)</td>
<td>7 (11.9)</td>
<td>50 (13.6)</td>
</tr>
<tr>
<td>no</td>
<td>111 (84.1)</td>
<td>156 (87.6)</td>
<td>52 (88.1)</td>
<td>319 (86.4)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Spasms</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>13 (9.8)</td>
<td>26 (14.6)</td>
<td>6 (10.2)</td>
<td>45 (12.2)</td>
</tr>
<tr>
<td>no</td>
<td>119 (90.2)</td>
<td>152 (85.4)</td>
<td>53 (89.8)</td>
<td>324 (87.8)</td>
</tr>
</tbody>
</table>

* respondents were able to select more than one medical condition and reason for use

No HC: No Health Canada; MMAR: Marihuana Medical Access Regulations; MMPR: Marihuana for Medical Purposes Regulations
Table 3.3  Bivariate multinomial logistic regression analyses of sociodemographic, medical conditions and reasons for use factors associated with authorization status (n = 369)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>MMAR vs. No HC</th>
<th>MMPR vs. No HC</th>
<th>MMPR vs. MMAR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sociodemographic factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(≥ 48 vs. &lt; 48)</td>
<td>0.95 (0.61 – 1.50)</td>
<td>0.75 (0.41 – 1.39)</td>
<td>0.79 (0.45 – 1.42)</td>
</tr>
<tr>
<td>Gender (female vs. male)</td>
<td>0.53 (0.34 – 0.84)**</td>
<td>0.88 (0.47 – 1.62)</td>
<td>1.65 (0.91 – 2.99)</td>
</tr>
<tr>
<td>Ethnicity (Caucasian vs. other)</td>
<td>1.28 (0.68 – 2.41)</td>
<td>0.98 (0.43 – 2.22)</td>
<td>0.76 (0.34 – 1.71)</td>
</tr>
<tr>
<td>Residence (sub/urban vs. rural)</td>
<td>0.63 (0.38 – 1.08)†</td>
<td>0.95 (0.45 – 2.00)</td>
<td>1.50 (0.75 – 3.00)</td>
</tr>
<tr>
<td>Province (BC vs. Ontario)</td>
<td>0.92 (0.53 – 1.57)</td>
<td>0.29 (0.13 – 0.69)**</td>
<td>0.32 (0.14 – 0.73)**</td>
</tr>
<tr>
<td>Province (Prairie vs. Ontario)</td>
<td>1.25 (0.61 – 2.59)</td>
<td>1.34 (0.57 – 3.15)</td>
<td>1.07 (0.49 – 2.34)</td>
</tr>
<tr>
<td>Province (Quebec vs. Ontario)</td>
<td>0.56 (0.22 – 1.43)</td>
<td>0.38 (0.10 – 1.47)</td>
<td>0.69 (0.17 – 2.73)</td>
</tr>
<tr>
<td>Province (Atlantic vs. Ontario)</td>
<td>1.48 (0.65 – 3.36)</td>
<td>0.42 (0.11 – 1.62)</td>
<td>0.28 (0.08 – 1.02)†</td>
</tr>
<tr>
<td>Income (&lt;$20,000 vs. ≥ $20,000)</td>
<td>0.66 (0.41 – 1.06)†</td>
<td>0.98 (0.52 – 1.84)</td>
<td>1.48 (0.80 – 2.75)</td>
</tr>
<tr>
<td>Employment (employed vs. other)</td>
<td>0.96 (0.60 – 1.52)</td>
<td>1.01 (0.54 – 1.90)</td>
<td>1.06 (0.58 – 1.94)</td>
</tr>
<tr>
<td>Education (≥ post-sec vs. &lt; post-sec)</td>
<td>1.21 (0.72 – 2.03)</td>
<td>1.01 (0.51 – 2.01)</td>
<td>0.83 (0.42 – 1.62)</td>
</tr>
<tr>
<td><strong>Medical conditions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain (yes vs. no)</td>
<td>0.85 (0.51 – 1.42)</td>
<td>0.65 (0.33 – 1.27)</td>
<td>0.76 (0.41 – 1.43)</td>
</tr>
<tr>
<td>Arthritis (yes vs. no)</td>
<td>0.93 (0.60 – 1.47)</td>
<td>0.88 (0.47 – 1.64)</td>
<td>0.94 (0.52 – 1.71)</td>
</tr>
<tr>
<td>Mental health (yes vs. no)</td>
<td>0.58 (0.37 – 0.92)*</td>
<td>1.26 (0.68 – 2.33)</td>
<td>2.16 (1.19 – 3.93)*</td>
</tr>
<tr>
<td>Miscellaneous (yes vs. no)</td>
<td>0.54 (0.33 – 0.91)*</td>
<td>0.47 (0.22 – 1.00)†</td>
<td>0.87 (0.41 – 1.85)</td>
</tr>
<tr>
<td>Respiratory (yes vs. no)</td>
<td>1.09 (0.63 – 1.90)</td>
<td>0.70 (0.31 – 1.60)</td>
<td>0.64 (0.29 – 1.42)</td>
</tr>
<tr>
<td>Nervous system (yes vs. no)</td>
<td>1.07 (0.61 – 1.88)</td>
<td>0.73 (0.32 – 1.68)</td>
<td>0.69 (0.31 – 1.52)</td>
</tr>
<tr>
<td>Gastrointestinal (yes vs. no)</td>
<td>1.07 (0.58 – 1.97)</td>
<td>1.21 (0.54 – 2.71)</td>
<td>1.13 (0.53 – 2.43)</td>
</tr>
</tbody>
</table>

No HC: No Health Canada; MMAR: Marihuana Medical Access Regulations; MMPR: Marihuana for Medical Purposes Regulations; OR: odds ratio; CI: confidence interval

* = p < 0.05; ** = p < 0.01; † = p < 0.1
Table 3.3  Bivariate multinomial logistic regression analyses of sociodemographic, medical conditions and reasons for use factors associated with authorization status (n = 369) (continued)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>MMAR vs. No HC</th>
<th>MMPR vs. No HC</th>
<th>MMPR vs. MMAR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unadjusted OR (95% CI)</td>
<td>Unadjusted OR (95% CI)</td>
<td>Unadjusted OR (95% CI)</td>
</tr>
<tr>
<td><strong>Medical conditions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiovascular (yes vs. no)</td>
<td>0.64 (0.35 – 1.16)</td>
<td>0.70 (0.31 – 1.60)</td>
<td>1.10 (0.48 – 2.52)</td>
</tr>
<tr>
<td>Endocrine (yes vs. no)</td>
<td>0.67 (0.35 – 1.26)</td>
<td>0.54 (0.21 – 1.40)</td>
<td>0.80 (0.31 – 2.09)</td>
</tr>
<tr>
<td>Cancer (yes vs. no)</td>
<td>0.73 (0.29 – 1.80)</td>
<td>1.38 (0.48 – 4.00)</td>
<td>1.90 (0.66 – 5.48)</td>
</tr>
<tr>
<td>HIV/AIDS (yes vs. no)</td>
<td>1.02 (0.40 – 2.62)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Reason for use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain relief (yes vs. no)</td>
<td>2.13 (1.01 – 4.49)*</td>
<td>1.82 (0.64 – 5.12)</td>
<td>0.85 (0.29 – 2.50)</td>
</tr>
<tr>
<td>Sleep (yes vs. no)</td>
<td>0.96 (0.59 – 1.57)</td>
<td>0.82 (0.42 – 1.58)</td>
<td>0.85 (0.45 – 1.59)</td>
</tr>
<tr>
<td>Mental health (yes vs. no)</td>
<td>0.71 (0.44 – 1.14)</td>
<td>0.87 (0.46 – 1.67)</td>
<td>1.23 (0.67 – 2.26)</td>
</tr>
<tr>
<td>Well-being (yes vs. no)</td>
<td>1.01 (0.64 – 1.58)</td>
<td>1.02 (0.55 – 1.89)</td>
<td>1.01 (0.56 – 1.83)</td>
</tr>
<tr>
<td>Nausea &amp; vomiting (yes vs. no)</td>
<td>1.06 (0.67 – 1.66)</td>
<td>1.17 (0.63 – 2.16)</td>
<td>1.11 (0.61 – 1.99)</td>
</tr>
<tr>
<td>Inflammation (yes vs. no)</td>
<td>2.26 (1.42 – 3.62)**</td>
<td>1.42 (0.25 – 2.68)</td>
<td>0.63 (0.35 – 1.14)</td>
</tr>
<tr>
<td>Loss of appetite &amp; weight loss (yes vs. no)</td>
<td>0.94 (0.60 – 1.49)</td>
<td>0.70 (0.37 – 1.32)</td>
<td>0.74 (0.40 – 1.37)</td>
</tr>
<tr>
<td>Miscellaneous (yes vs. no)</td>
<td>0.75 (0.39 – 1.42)</td>
<td>0.71 (0.28 – 1.78)</td>
<td>0.95 (0.39 – 2.36)</td>
</tr>
<tr>
<td>Spasms (yes vs. no)</td>
<td>1.57 (0.77 – 3.18)</td>
<td>1.04 (0.37 – 2.87)</td>
<td>0.66 (0.26 – 1.70)</td>
</tr>
</tbody>
</table>

No HC: No Health Canada; MMAR: Marihuana Medical Access Regulations; MMPR: Marihuana for Medical Purposes Regulations; OR: odds ratio; CI: confidence interval

* = \( p < 0.05 \); ** = \( p < 0.01 \); † = \( p < 0.1 \)
Table 3.4 Multivariate multinomial logistic regression analyses of sociodemographic and health-related factors associated with authorization status (n = 369)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>MMAR vs. no HC</th>
<th>MMPR vs. no HC</th>
<th>MMPR vs. MMAR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adjusted OR (95% CI)</td>
<td>Adjusted OR (95% CI)</td>
<td>Adjusted OR (95% CI)</td>
</tr>
<tr>
<td><strong>Sociodemographic factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (female vs. male)</td>
<td>0.57 (0.35 – 0.93)*</td>
<td>1.11 (0.58 – 2.13)</td>
<td>1.96 (1.03 – 3.70)*</td>
</tr>
<tr>
<td>Province (BC vs. Ontario)</td>
<td>0.95 (0.54 – 1.68)</td>
<td>0.31 (0.13 – 0.73)**</td>
<td>0.32 (0.14 – 0.75)**</td>
</tr>
<tr>
<td>Province (Prairie vs. Ontario)</td>
<td>1.01 (0.47 – 2.17)</td>
<td>1.34 (0.55 – 3.25)</td>
<td>1.33 (0.58 – 3.04)</td>
</tr>
<tr>
<td>Province (Quebec vs. Ontario)</td>
<td>0.49 (0.18 – 1.33)</td>
<td>0.38 (0.10 – 1.48)</td>
<td>0.77 (0.19 – 3.18)</td>
</tr>
<tr>
<td>Province (Atlantic vs. Ontario)</td>
<td>1.54 (0.65 – 3.62)</td>
<td>0.40 (0.10 – 1.58)</td>
<td>0.26 (0.07 – 0.97)*</td>
</tr>
<tr>
<td><strong>Health status factors: medical conditions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental health (yes vs. no)</td>
<td>0.62 (0.38 – 1.03)</td>
<td>1.50 (0.77 – 2.92)</td>
<td>2.40 (1.26 – 4.60)**</td>
</tr>
<tr>
<td>Miscellaneous (yes vs. no)</td>
<td>0.60 (0.34 – 1.06)</td>
<td>0.43 (0.19 – 0.97)*</td>
<td>0.71 (0.32 – 1.62)</td>
</tr>
<tr>
<td><strong>Health status factors: reasons for use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflammation (yes vs. no)</td>
<td>2.56 (1.57 – 4.17)**</td>
<td>1.57 (0.81 – 3.04)</td>
<td>0.61 (0.33 – 1.15)</td>
</tr>
</tbody>
</table>

No HC: No Health Canada; MMAR: Marihuana Medical Access Regulations; MMPR: Marihuana for Medical Purposes Regulations; OR: odds ratio; CI: confidence interval
* = p < 0.05; ** = p < 0.01
Table 3.5 Descriptive statistics and bivariate multinomial logistic regression analyses of quantity of use and authorization status (n = 359)

<table>
<thead>
<tr>
<th>Quantitative Statistics</th>
<th>Descriptive statistics ( n (%) )</th>
<th>Unadjusted OR ( OR (95% CI) )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No HC ( n = 126 )</td>
<td>MMAR ( n = 174 )</td>
</tr>
<tr>
<td><strong>Quantity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>1 g/day</td>
<td>4 g/day</td>
</tr>
<tr>
<td>Mean</td>
<td>2.67 g/day</td>
<td>8.40 g/day</td>
</tr>
<tr>
<td>IQR</td>
<td>1-3 g/day</td>
<td>2-10 g/day</td>
</tr>
<tr>
<td><strong>Amount</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;2.5g/day</td>
<td>35 (27.8)</td>
<td>117 (67.2)</td>
</tr>
<tr>
<td>≤2.5g/day</td>
<td>91 (72.2)</td>
<td>57 (32.8)</td>
</tr>
<tr>
<td>&gt;5g/day</td>
<td>13 (10.3)</td>
<td>59 (33.9)</td>
</tr>
<tr>
<td>≤5g/day</td>
<td>113 (89.7)</td>
<td>115 (66.1)</td>
</tr>
</tbody>
</table>

No HC: No Health Canada; MMAR: Marihuana Medical Access Regulations; MMPR: Marihuana for Medical Purposes Regulations; OR: odds ratio; CI: confidence interval

* = \( p < 0.05 \); ** = \( p < 0.01 \)
Table 3.6 Descriptive statistics and bivariate multinomial logistic regression analyses of modes of use and authorization status (n = 369)

<table>
<thead>
<tr>
<th>Mode of Use</th>
<th>Descriptive statistics</th>
<th>Unadjusted OR</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>Unadjusted OR</td>
<td>OR (95% CI)</td>
</tr>
</tbody>
</table>
|                   | No HC  
n = 132         | MMAR  
n = 178 | MMPR  
n = 59 | Total  
n=369 |
| Any inhalation    |                         |               |             |
| yes vs. no        | 123 (93.2)              | 169 (94.9)    | 56 (94.9)   | 348 (94.3) |
|                   | 1.37 (0.53 – 3.56)      | 1.37 (0.36 – 5.24) | 0.99 (0.26 – 3.80) |
| Smoked            |                         |               |             |
| yes vs. no        | 108 (81.8)              | 137 (77.0)    | 40 (67.8)   | 285 (77.2) |
|                   | 0.74 (0.42 – 1.30)      | 0.47 (0.23 – 0.94)* | 0.63 (0.33 – 1.20) |
| Vaporized         |                         |               |             |
| yes vs. no        | 73 (55.3)               | 128 (71.9)    | 44 (74.6)   | 245 (66.4) |
|                   | 2.07 (1.29 – 3.32)**    | 2.37 (1.20 – 4.68)* | 1.15 (0.59 – 2.24) |
| Inhaled concentrates |                       |               |             |
| yes vs. no        | 41 (31.1)               | 74 (41.6)     | 19 (32.2)   | 134 (36.3) |
|                   | 1.58 (0.98 – 2.54)      | 1.05 (0.55 – 2.04) | 0.67 (0.36 – 1.24) |
| Edibles           |                         |               |             |
| yes vs. no        | 76 (57.6)               | 132 (74.2)    | 37 (62.7)   | 245 (66.4) |
|                   | 2.11 (1.31 – 3.42)**    | 1.24 (0.66 – 2.33) | 0.59 (0.31 – 1.10) |
| Juiced            |                         |               |             |
| yes vs. no        | 11 (08.3)               | 38 (21.3)     | 3 (5.1)     | 52 (14.1) |
|                   | 2.99 (1.46 – 6.10)**    | 0.59 (0.16 – 2.20) | 0.20 (0.06 – 0.67)** |
| Ingested concentrates |                     |               |             |
| yes vs. no        | 28 (21.2)               | 72 (40.4)     | 9 (15.3)    | 109 (29.5) |
|                   | 2.52 (1.51 – 4.22)**    | 0.67 (0.29 – 1.52) | 0.26 (0.12 – 0.57)** |
| Tinctures         |                         |               |             |
| yes vs. no        | 23 (17.4)               | 57 (32.0)     | 10 (16.9)   | 90 (24.4) |
|                   | 2.23 (1.29 – 3.87)**    | 0.97 (0.43 – 2.19) | 0.43 (0.20 – 0.92)* |
| Topicals          |                         |               |             |
| yes vs. no        | 23 (17.4)               | 56 (31.5)     | 10 (16.9)   | 89 (24.1) |
|                   | 2.18 (1.26 – 3.77)**    | 0.97 (0.43 – 2.19) | 0.44 (0.21 – 0.94)* |

No HC: No Health Canada; MMAR: Marihuana Medical Access Regulations; MMPR: Marihuana for Medical Purposes Regulations; OR: odds ratio; CI: confidence interval. Respondents were able to select more than one mode of use.
* = p <0.05; ** = p < 0.01
Table 3.7  Descriptive statistics and bivariate multinomial logistic regression analyses of problems experienced with access and authorization status (n = 369)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Descriptive statistics n (%)</th>
<th>Unadjusted OR OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No HC n = 132</td>
<td>MMAR n = 178</td>
</tr>
<tr>
<td>Getting documentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes vs. no</td>
<td>74 (56.1)</td>
<td>84 (47.2)</td>
</tr>
<tr>
<td>Cost of documentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes vs. no</td>
<td>35 (26.5)</td>
<td>54 (30.3)</td>
</tr>
<tr>
<td>Finding effective strains/products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes vs. no</td>
<td>51 (38.6)</td>
<td>85 (47.8)</td>
</tr>
<tr>
<td>Availability of cannabis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes vs. no</td>
<td>54 (40.9)</td>
<td>71 (39.9)</td>
</tr>
<tr>
<td>Waiting time for registration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes vs. no</td>
<td>26 (19.7)</td>
<td>55 (30.9)</td>
</tr>
<tr>
<td>Waiting time to receive product</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes vs. no</td>
<td>22 (16.7)</td>
<td>52 (29.2)</td>
</tr>
<tr>
<td>Not enough information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes vs. no</td>
<td>42 (31.8)</td>
<td>47 (26.4)</td>
</tr>
<tr>
<td>Other problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes vs. no</td>
<td>45 (34.1)</td>
<td>67 (37.6)</td>
</tr>
<tr>
<td>No problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes vs. no</td>
<td>23 (17.4)</td>
<td>25 (14.0)</td>
</tr>
</tbody>
</table>

No HC: No Health Canada; MMAR: Marihuana Medical Access Regulations; MMPR: Marihuana for Medical Purposes Regulations; OR: odds ratio; CI: confidence interval. Respondents were able to select more than one problem with access.

* = p < 0.05; ** = p < 0.01
Table 3.8 Summary of significant associations between factors and authorization status

<table>
<thead>
<tr>
<th>Factors</th>
<th>MMAR</th>
<th>MMPR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sociodemographic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>(-) vs. No HC and MMPR</td>
<td>(-) vs. No HC and MMAR</td>
</tr>
<tr>
<td>B.C.*</td>
<td></td>
<td>(-) vs. MMAR</td>
</tr>
<tr>
<td>Atlantic*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Medical conditions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental health</td>
<td></td>
<td>(+) vs. MMAR</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
<td>(-) vs. No HC</td>
</tr>
<tr>
<td><strong>Reasons for use</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflammation</td>
<td></td>
<td>(+) vs. No HC</td>
</tr>
<tr>
<td><strong>Quantity used</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;2.5 g/day</td>
<td>(+) vs. No HC</td>
<td>(+) vs. No HC</td>
</tr>
<tr>
<td>&gt;5.0 g/day</td>
<td>(+) vs. No HC</td>
<td>(-) vs. MMAR</td>
</tr>
<tr>
<td><strong>Modes of use</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoked</td>
<td></td>
<td>(-) vs. No HC</td>
</tr>
<tr>
<td>Vaping</td>
<td>(+) vs. No HC</td>
<td>(+) vs. No HC</td>
</tr>
<tr>
<td>Edibles</td>
<td>(+) vs. No HC</td>
<td></td>
</tr>
<tr>
<td>Juicing, ingesting concentrates, tinctures, topicals</td>
<td>(+) vs. No HC and MMPR</td>
<td></td>
</tr>
<tr>
<td><strong>Problems experienced</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost of cannabis</td>
<td>(+) vs. No HC and MMAR</td>
<td>(+) vs. No HC and MMAR</td>
</tr>
<tr>
<td>Effective strains</td>
<td>(+) vs. No HC</td>
<td>(+) vs. No HC</td>
</tr>
<tr>
<td>Waiting time for registration</td>
<td>(+) vs. No HC</td>
<td>(+) vs. No HC and MMAR</td>
</tr>
<tr>
<td>Waiting time for product</td>
<td>(+) vs. No HC</td>
<td>(+) vs. No HC</td>
</tr>
<tr>
<td>Availability of product</td>
<td>(+) vs. No HC</td>
<td>(+) vs. MMAR</td>
</tr>
</tbody>
</table>

*No HC: No Health Canada (n=132); MMAR: Marihuana Medical Access Regulations (n=178); MMPR: Marihuana for Medical Purposes Regulations (n=59)
*Ontario was used as reference province
Table 3.9 Patient and system factors significantly associated with authorization status in relation to the Levesque model of access to health care

<table>
<thead>
<tr>
<th>Health care needs</th>
<th>Perception of need and desire for care</th>
<th>Health care seeking</th>
<th>Health care reaching</th>
<th>Health care Utilization</th>
<th>Health care consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient factors</strong></td>
<td>Ability to perceive</td>
<td>Ability to seek</td>
<td>Ability to reach</td>
<td>Ability to pay</td>
<td>Ability to engage</td>
</tr>
<tr>
<td>Health-related factors:</td>
<td>Sociodemographic characteristics:</td>
<td>Sociodemographic characteristics:</td>
<td>Sociodemographic characteristics:</td>
<td>Patterns of use:</td>
<td></td>
</tr>
<tr>
<td>- medical conditions</td>
<td>- gender</td>
<td>- gender</td>
<td>- gender</td>
<td>- quantity used</td>
<td></td>
</tr>
<tr>
<td>- geographic location</td>
<td>- geographic location</td>
<td>- geographic location</td>
<td>- mode of use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health-related factors:</td>
<td>Health-related factors:</td>
<td>Health-related factors:</td>
<td>Health-related factors:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- medical conditions</td>
<td>- medical conditions</td>
<td>- medical conditions</td>
<td>- medical conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- reasons for use</td>
<td>- reasons for use</td>
<td>- reasons for use</td>
<td>- reasons for use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patterns of use:</td>
<td>Patterns of use:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- quantity used</td>
<td>- mode of use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>System factors</strong></td>
<td>Approachability</td>
<td>Acceptability</td>
<td>Available and accommodation</td>
<td>Affordability</td>
<td>Appropriateness</td>
</tr>
<tr>
<td>Problems:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- effective strains and products</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- availability of product</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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CHAPTER 4: FACTORS ASSOCIATED WITH ACCESSING MEDICAL CANNABIS FROM LEGAL AND ILLEGAL SOURCES AND PERCEPTIONS OF QUALITY AMONG AUTHORIZED USERS

4.1 Introduction

As described in Section 1.2, in 2001, Canada enacted a medical cannabis program with the goal of providing reasonable access to cannabis for medical purposes. In the context of federal criminal laws prohibiting the possession, production and distribution of cannabis, the medical cannabis program and its related regulations comprise both authorization to legally possess cannabis for medical purposes, and legal sources for obtaining cannabis for medical purposes. This chapter focuses on factors associated with access to legal and illegal sources of cannabis for medical purposes.

The *Marihuana Medical Access Regulations* (MMAR), implemented in 2001 and administered by Health Canada, provided several legal sources of cannabis to those authorized to use it for medical purposes, including producing one’s own supply with a personal production license, designating someone to grow on one’s behalf with a designated production license, or acquiring cannabis through mail-order from Health Canada’s sole contracted supplier, Prairie Plant Systems (Government of Canada, 2001). However, previous research identified barriers to accessing these sources, including the quality of the supply, the strains and products available, the cost associated with access, challenges with learning to cultivate, legal concerns, and difficulty finding a designated producer (Belle-Isle et al., 2014; Belle-Isle & Hathaway, 2007; Lucas, 2012; Stambrook et al., 2012; Walsh et al., 2013). These studies also reported that many individuals who did obtain authorization under the MMAR
nonetheless utilized illegal sources. For example, it was estimated that only ~20% of study participants authorized under the MMAR accessed cannabis exclusively from legal sources (Belle-Isle et al., 2014), suggesting that patients’ needs were not being met by the legal sources available to them. The Marihuana for Medical Purposes Regulations (MMPR), implemented in October 2013, were set to replace the legal sources available through the MMAR with licensed producers (LPs) in April 2014, as the only legal source of cannabis for eligible patients (Government of Canada, 2013). However, a court injunction (Allard et al. v. Canada, 2014) allowed for the continuation of the MMAR and the legal sources available under those regulations until a court case questioning the constitutionality of the MMPR could be heard, which did not occur until 2016 (Allard et al. v. Canada, 2016). As such, the legal sources associated with both regulations were available during that time to individuals authorized under the respective regulations.

Since the implementation of the MMPR, and the addition of LPs as a legal source of cannabis, there has been no national evaluation undertaken to determine whether this change in legal sources impacted the use of illegal sources by authorized medical cannabis patients. Thus, an objective of this study was to identify patient- and system-related factors associated with accessing illegal and legal sources of cannabis among adults authorized to use cannabis for medical purposes in Canada. This assessment will provide a foundation for future assessments of the current regulations, the Access to Cannabis for Medical Purposes Regulations (ACMPR), which were implemented in 2016 and reinstated personal and designated production options, to exist alongside LPs (Government of Canada, 2016). These findings are also applicable to upcoming regulations for the legalization of cannabis for recreational
purposes in Canada, as they highlight features of cannabis sources that can be incorporated into the legal market to deter use of the illegal market.

4.2 Methods

This study utilized the cross-sectional data retrieved from a national sample online survey, as described in detail in Section 1.6. For this analysis, we included all study participants with MMAR and MMPR authorization status who completed the survey and indicated that they currently used cannabis for medical purposes.

4.2.1 Variable selection

The primary outcome of interest for the first part of the analysis is “source status”. Participants were categorized as currently accessing cannabis from either: (1) only legal sources (“legal only source status”); or (2) both legal and illegal sources (“illegal source status”). At the time of the study, legal sources were those sanctioned by Health Canada in relation to the MMAR and MMPR, including: Health Canada’s supplier, licensed personal production, licensed designated producers, and LPs. Illegal sources included: medical cannabis dispensaries (hereafter dispensaries), personal production without a license, close friends or family, acquaintances or dealers, and unfamiliar street sources. Informed by the Levesque et al. patient-centred conceptual framework of access to health care (the Levesque model), described in Chapter 1.4 (Figure 1.2), input from study investigators and community partners, and previous studies exploring barriers to accessing cannabis for medical purposes (Belle-
Isle et al., 2014; Belle-Isle & Hathaway, 2007; Bottorff et al., 2013; Lucas, 2012; Reiman, 2007; Reinarman et al., 2011; Walsh et al., 2013), a range of patient- and system- related factors potentially associated with accessing legal and illegal sources were identified. Patient-related factors included sociodemographic and health-related factors, and system-related factors included characteristics of cannabis products and services. All variables were coded dichotomously as yes vs. no unless otherwise stated. (See Appendix A for survey questions).

Sociodemographic factors examined in this analysis included the following: median age (≥ 48 vs. < 48); gender ⁵ (female vs. male); ethnicity defined as identifying as only Caucasian or identifying with another ethnocultural background (Caucasian vs. other); residence (urban/suburban vs. rural); province, with Ontario used as the reference because the majority of study participants were from this province (Ontario (ref) vs. British Columbia vs. Prairies vs. Quebec vs. Atlantic); income defined as above or equal to or below $20k, representing the poverty line in Canada (≥ $20K vs. < $20K); employment, with employed defined as full-time, part time, casual or self-employed, and other defined as unemployed, retired, on disability or student (employed vs. other); education ≥ post-secondary vs. < post-secondary); and authorization status (MMAR vs. MMPR).

Health-related factors examined included medical conditions and reasons for use of cannabis (i.e., symptoms). Participants were asked if they had been diagnosed by a healthcare professional with any medical conditions, with responses categorized as: chronic pain; arthritis; mental health; respiratory; gastrointestinal; cardiovascular;

⁵ There were few participants self-reporting other gender categories (e.g., transgendered), analysis was restricted to those who identified as male or female.
nervous system; endocrine; cancer; HIV/AIDS; and miscellaneous conditions, defined as conditions that did not fall into the other categories (e.g., shingles, glaucoma, hepatitis C). Participants were also asked to select their reasons for using medical cannabis, which were categorized as: pain; sleep; mental health; nausea and vomiting; well-being; inflammation; loss of appetite and weight loss; spasms; and miscellaneous reasons defined as reasons that did not fall into the other categories.

Study participants were also asked to select characteristics of medical cannabis products and services that they considered important. The list of characteristics was developed by study investigators drawing on previous studies, expert opinion, input from community partners, medical cannabis users, and industry standards (Belle-Isle et al., 2014; Capler, Prosk, & Leung, 2013; Walsh et al., 2013; Ware, Ducruet, & Robinson, 2006). These characteristics included access to preferred strains; access to a variety of strains; access to a variety of products (e.g., baked good, tinctures, oils, hashish, etc.); organically grown; free of pesticides and fertilizers; free of microbial contaminants; able to select strain and dosage; able to observe and smell before purchase; standardized levels of ingredients (e.g., cannabinoids, terpenes); available in large quantities; available in small quantities; sent to their home; available in a dispensary; available in a pharmacy; provided in trimmed form (i.e., the small leaves have been removed from the cannabis flower); provided in milled form; and other characteristics, which they were asked to specify.

In the second part of the analysis, the outcome of interest was satisfaction levels (i.e., perceived quality) with various dimensions of cannabis products and services provided by legal and illegal sources of cannabis. Differences in satisfaction levels between legal and illegal sources were also explored. Satisfaction was conceptualized
as perceived quality (i.e., the judgment of, or impression about, an entity’s overall excellence or superiority), which some researchers postulate is an apt construct that connects to both satisfaction and behavioural intentions (Dagger, Sweeney, & Johnson, 2007; Gill & White, 2009). The satisfaction-related items developed for this study were adapted from the Health Services Quality Scale (HSQS), a measure of perceived quality of health services (Dagger et al., 2007). The HSQS has been found to be reliable and valid in samples from private outpatient oncology clinics and general practice clinics and is applicable to high-involvement, high-contact, ongoing service (Dagger et al., 2007). Such attributes characterize access to cannabis for medical purposes, thus it is appropriate for use in this study. The development of satisfaction-related items was also informed by research that examined medical cannabis users’ evaluations of cannabis characteristics (Ware et al., 2006), industry standards (Capler et al., 2013), and input from study investigators and community partners.

For each current source of cannabis that participants indicated they used, they were asked to rate the following dimensions and related items:

1. **Quality of medical cannabis products** was measured on a 1 to 5 Likert-type scale (1 = very poor to 5 = very good). Items included: presentation, constructed as a composite score for humidity, appearance, and grind; potency, defined as THC content; strains, measured as a composite score for selection of strains and availability of preferred strains; availability of cannabis products, defined as availability of edibles, tinctures, etc.; effectiveness at relieving symptoms; and overall product satisfaction.

2. **Quality of care and service** was measured as a composite score of ten items focused on personal rapport and attention provided by sources of cannabis.
Items were rated using a 1 to 5 Likert-type scale (1 = strongly disagree to 5 = strongly agree), and included a “not applicable” response option to capture instances where items were not relevant for particular sources. Items included: they always listen to what I have to say; they understand my needs; there are opportunities for me to provide feedback; I find it easy to talk with them; they answer my questions; they explain things in a way that I can understand; I believe they care about me; I talk with them about things that are happening in my life, not just about my medical condition or cannabis products; I get personalized attention from them; and I have built a good relationship with them.

3. Quality of expertise and support was determined by a composite score of ratings on six items focused on competency, training and support related to their cannabis use on a 1 to 5 Likert-type scale (1 = strongly disagree to 5 = strongly agree), and included a “not applicable” response option to capture instances where items were not relevant for particular sources. Items included: I can rely on them to be well trained and qualified; they carry out their tasks competently; they provide thorough explanations about the medicine and different ways to take it; they make good recommendations for strains and products most appropriate for my particular condition and symptoms; they help me to keep track of the cannabis strains and products I have used; and they support me to meet my needs around medical cannabis.

4. Administrative quality and accessibility was defined as a composite score of ratings on six items focused on efficiency, convenience, and safety on a 1 to 5 Likert-type scale (1 = strongly disagree to 5 = strongly agree), and
included a “not applicable” response option to capture instances where items were not relevant for particular sources. Items included: I receive medical cannabis in a timely manner; generally, appointments run on time; they have responded to my calls or other inquiries in a timely manner; the registration procedures are accurate; I believe is well managed; the hours of operation meet my needs; the location is convenient; the options for accessing medical cannabis meet my needs (i.e., mail, in-person); I feel safe getting cannabis through this source.

5. **Affordability** was gauged by a single item that asked participants to rate their level of agreement on a 1 to 5 Likert-type scale (1 = strongly agree; 5 = strongly disagree) and included a “not applicable” response option to capture instances where the item was not relevant for particular sources, regarding whether cannabis and associated cost are affordable.

6. **Overall Satisfaction** was assessed by a single item asking participants to rate their overall satisfaction with sources on a 1 to 5 Likert-type scale, with 1 = completely unsatisfied and 5 = completely satisfied.

### 4.2.2 Statistical analysis

As a first step, baseline descriptive statistics were used to explore the distribution of sources used, stratified by authorization status (MMPR and MMAR) and across the total sample. Descriptive statistics were also employed to characterize the sociodemographic and health-related factors, and characteristics of cannabis products and services participants considered important, stratified by source status (legal and illegal sources status). To examine bivariate associations between the explanatory variables of interest and source status, simple logistic regressions were
constructed, and 95% confidence intervals were calculated. Only complete cases were included, missing data was less than 5%. An a priori defined statistical protocol was then used based on examination of the Akaike Information Criterion (AIC) and p-values to construct an explanatory multivariate logistic regression model. First, a full model was constructed that included all variables with $p < 0.10$ in bivariate analyses. After noting the AIC of the model, the variable with the largest p-value was removed and a reduced model was built. We continued this iterative process until no variables remained for inclusion. The final multivariate model selected was the one with the lowest AIC score. We assessed multicollinearity using the Variance Inflation Factor. All p-values were two-sided.

To examine participants’ perceptions of the quality of services and products provided by sources they indicated currently using, summary statistics (mean, median and IQR) were conducted on the dimensions of perceived quality of product, care and service, expertise and support, administration and accessibility, affordability, and overall satisfaction score with different cannabis sources. Composite scores were the calculated as the average of scores for all items, and were not calculated for participants with missing data, including if they selected the “not applicable” response option. Wilcoxon rank sum tests were used to compare ratings for legal and illegal sources on these dimensions among study participants with MMAR and MMPR authorization status.

4.3 Results

4.3.1 Distribution of cannabis sources accessed
This sample included 237 participants who were authorized under the MMAR or MMPR to use cannabis for medical purposes. There was a near even split between those with legal only source status (n=119) and those with illegal source status (n=118). As shown in Table 4.1, among these participants, the most widely used cannabis source was personal production with a license (40.9%), followed by dispensaries (32.1%) and licensed producers (26.6%). Unfamiliar street source and personal production (without a license) were the least used cannabis sources (4.2% and 4.6%, respectively).

4.3.2 Sociodemographic and health-related factors associated with source status

Table 4.2 shows the descriptive statistics and bivariate analyses of sociodemographic characteristics stratified by cannabis source status. No significant differences were found in sociodemographic factors between the legal only source group and the illegal source group.

The descriptive statistics and bivariate analyses of health-related factors stratified by cannabis source status are shown in Table 4.3. Pain was the most prevalent reported medical condition for both the legal only source group and the illegal source group. For the legal only source group, the top three medical conditions indicated were pain (71.4%), arthritis (47.1%) and mental health conditions (37%). In the illegal source group, the top reported medical conditions were pain (69.5%), mental health conditions (43.2%) and arthritis (39.8 %). There were no significant associations between reported medical conditions and source status in the bivariate analyses.
Regarding reasons for using medical cannabis, for both source status groups, the most common reason for using medical cannabis was pain, followed by sleep issues and mental health. The results of the bivariate analyses revealed that use of cannabis for inflammation was significantly and negatively associated with the legal only source status (odds ratio [OR]: 0.55; 95% confidence interval [CI]: 0.33-0.92).

Table 4.4 shows the results of the multivariate analyses of reasons for use associated with source status. As shown, inflammation was found to be independently and negatively associated with the use of only legal sources (adjusted odds ratio [AOR]:0.53; 95% CI: 0.31-0.88).

4.3.3 Associations between important characteristics of cannabis products and services and source status

Table 4.5 shows the descriptive statistics and bivariate analyses for important characteristics of cannabis products and services stratified by source status. Among those in the legal only source group, access to their preferred strains was selected as an important characteristic by the most individuals (88.2%), followed by access to a variety of products (84.0%) and organically grown product (80.7%). Among those in the illegal source group, pesticide-free products was considered important by the most individuals (89.0%), as was ability to select strain and dosage (88.1%) and access to their preferred strains (87.3%).

The bivariate analysis shows that compared to individuals who access cannabis from both illegal and legal sources, individuals who used only legal sources were significantly less likely to consider as important: pesticide-free product (OR: 0.44; 95% CI: 0.22-0.91); access to a variety of strains (OR: 0.49; 95% CI: 0.25-0.95); ability to select strain and dosage (OR: 0.24; 95% CI: 0.12-0.47); ability to observe and
smell (OR: 0.44; 95% CI: 0.26-0.77); available in a dispensary (OR: 0.22; 95% CI: 0.12-0.39); and available in small quantities (OR: 0.46; 95% CI: 0.28-0.78).

4.3.4 Satisfaction with product quality

Table 4.6 shows the summary statistics of product satisfaction for legal and illegal sources used by authorized participants, including overall product satisfaction and perceived quality of presentation, potency, strains, product availability, and effectiveness. Participants reported the highest mean overall product satisfaction for designated producer, followed by personal production with a license, and personal production without a license. Mean presentation scores were highest for designated producer and personal production with a license, followed by personal production without a license. The highest mean potency scores were given for designated producer, followed by personal production with a license and dispensary. Mean strain scores were highest for personal production without a license followed by dispensary and personal production with a license. For cannabis products, the highest mean scores were given for personal production without a license, followed by personal production with a license and dispensary. The highest mean scores for effectiveness were given for personal production without a license, followed by designated producer and dispensary.

Wilcoxon rank sum test comparing legal and illegal sources on product satisfaction scores revealed that there were no significant differences between legal and illegal sources for overall product satisfaction level or for any other parameter of product satisfaction (overall product satisfaction: \( p=0.16 \); presentation: \( p=0.07 \);
potency: $p=0.87$; strains availability and selection: $p=0.53$; product availability: $p=0.17$; effectiveness: $p=0.26$) (Table not shown).

### 4.3.5 Satisfaction with quality of care; expertise and support; administration and accessibility

Table 4.7 shows summary statistics of perceived quality of care, expertise and support, and administration and accessibility scores for legal and illegal sources of cannabis. Mean scores for quality of care were highest for close friend or family, followed by designated producer and dispensary. Mean scores for expertise and support were highest for designated producer, followed by dispensary, and close friend or family. Personal production without a license, followed by designated producer, and dispensary received the highest mean scores for administration. Health Canada’s supplier PPS and unfamiliar street source received the lowest ratings for all three of these measures of service quality.

Table 4.8 shows the results of the Wilcoxon rank sum test comparing legal and illegal sources for quality of care, expertise and support, and administration and accessibility. As shown, illegal sources were rated significantly higher than legal sources for quality of care ($p=0.004$), expertise and support ($p=0.025$), and administration and accessibility ($p=0.008$).

### 4.3.6 Affordability and overall satisfaction ratings associated with use of legal and illegal sources

Table 4.9 shows summary statistics for affordability and overall satisfaction scores for legal and illegal sources. The highest affordability mean scores were for personal production without a license, followed by designated producer and personal production with a license. The highest mean overall satisfaction scores were for
designated producer, personal production with a license, and personal production without a license. Results from the Wilcoxon rank sum test reveal no significant difference in ratings for the affordability between legal and illegal sources ($p=0.26$), and no significant difference in ratings for overall satisfaction between legal and illegal sources ($p=0.89$) (Table not shown).

4.4 Discussion

The first part of the analyses examined factors associated with accessing cannabis from ‘legal only sources’ and from ‘illegal sources’, to help provide an understanding of the difference between medical cannabis users authorized under the MMAR and MMPR who access cannabis from illegal sources and those who do not. The second part of the analysis examined satisfaction with various dimensions of cannabis products and services provided by the legal and illegal sources accessed by authorized medical users. The evidence shows that the potential barriers and facilitators to accessing legal and illegal sources of cannabis appear not to relate directly to sociodemographic factors or health conditions of the individuals, but rather are related to the importance they assign to different characteristics of medical cannabis products and services, and their satisfaction with the products and services provided by the sources they access (see Table 4.10). These patient- and system-related factors will be discussed below in the context of relevant literature and their potential impact on the various stages of access as outlined in the Levesque model (see Table 4.11).
4.4.1 Legal and illegal sources accessed

Personal production with a license was the most commonly accessed source of cannabis by authorized medical cannabis users in the present study. This source was available to individuals authorized under the MMAR, however, it was accessed by only 51.7% of those authorized under the MMAR in our study. LPs, accessible to individuals authorized under the MMPR, were accessed by ~70% of those authorized under the MMPR in our study. Other legal sources, including designated producers and Health Canada’s supplier, were only available to those authorized under the MMAR, and were not widely used. Approximately half the sample of legally authorized medical cannabis patients accessed cannabis from illegal sources. This is a lower proportion than reported in a previous cross-sectional study of 628 medical cannabis users in Canada, in which 80.0% of MMAR authorized participants reported using illegal sources (Belle-Isle et al., 2014). Dispensaries were the most commonly accessed illegal source of cannabis in the current study, with approximately 30% of both MMAR and MMPR authorized participants using this source. Previous studies of MMAR authorized patients in Canada reported a higher proportion of MMAR licensed patients, ~50-80%, accessed cannabis from dispensaries (Lucas, 2012; Walsh et al., 2013). In another Canadian study, 47% of participants accessing cannabis from dispensaries were authorized under the MMAR, also attesting to the high rate of dispensary use by authorized patients (Capler, Walsh, et al., 2017).

Aside from dispensaries, other illegal sources were not frequently accessed. The high rate of dispensary use by authorized patients, who otherwise appear to shun illegal sources, may be related to the perception that dispensaries have more in common with legal sources than other illegal sources. This perception may come from
the long history of dispensaries in Canada, which have been providing access to cannabis for medical purposes since 1997 (Capler, 2010). Additionally, dispensaries have been acknowledged in some court cases for filling a gap in the federal medical cannabis program, and several municipalities in Canada have either turned a blind eye or created regulations for them, conferring a sense of legitimacy to these establishments (Allard et al. v. Canada, 2016; City of Vancouver, 2015; City of Victoria, 2016; Hitzig v. Canada, 2003). Additionally, dispensaries, although being de facto illegal, have actively tried to differentiate themselves from other illegal sources, positioning themselves as ‘quasi-legal’, and as occupying a legal ‘grey zone’ (Capler, 2010; McGillivray, 2017). Studies of dispensaries in the USA, and cannabis social clubs in Spain and Belgium, also highlight the quasi-legal nature of these outlets, which are considered to be in a grey area of legislation (Belackova, Tomkova, & Zabransky, 2016; Decorte, 2015; Martín & Alonso, 2011). For individuals who sought legal authorization, the perception of quasi-legal status may have increased the acceptability of dispensaries, despite their illegal status, and encouraged use of this source at the seeking stage of access. It would be of interest for future research to assess to what extent dispensary use is based on the perception of legality. Other factors influencing use of these illegal sources by authorized medical cannabis users may also include the products and services these sources provide, as will be further discussed below (see Section 4.4.3).

With the upcoming legalization of cannabis for recreational purposes, there will be additional legal sources for accessing cannabis, including storefront and online sales through private retailers and provincial government distributors. Though not explicitly meant to provide access to medical users, it will be of interest for future
research to assess the utilization of these new legal sources by medical patients, and their impact on access to cannabis for medical purposes in Canada.

### 4.4.2 Sociodemographic and health-related factors

While some sociodemographic characteristics and health conditions appear to be associated with legal authorization, as found in the current study (see Chapter 3) and past research (Belle-Isle et al., 2014; Walsh et al., 2013), these factors do not appear to differentiate those accessing ‘legal only’ and ‘illegal’ sources of medical cannabis among individuals with legal authorization. The only health-related factor associated with source status in the current study was the use cannabis for inflammation. Individuals reporting this reason for using cannabis were almost half as likely to be using only legal sources of cannabis than ‘illegal’ sources. This finding suggests that individuals using cannabis to manage inflammation may need to go beyond legal sources to meet their needs. This does not appear to be related to the quantity of cannabis required, however, since past research on cannabis for medical purposes in Canada under the MMAR has not indicated that patients who use cannabis for inflammation use greater quantities of cannabis (Walsh et al., 2013). Rather, individuals who use cannabis for medical purposes in Canada and other jurisdictions have reported that strain type is an important determinant of effectiveness (Sexton et al., 2016; Walsh et al., 2013) and research has suggested a subjective and theoretical differential therapeutic activity of distinct strains on various symptoms (Cuttler, Spradlin, & McLaughlin, 2018; Russo, 2011; Russo & Guy, 2006; Sawler et al., 2015). This evidence suggests that individuals with inflammation may have sought access to effective strains or products (e.g., edibles), which were not available from legal sources at the time of this study. Access to preferred strains was also considered
important to dispensary users in a previous study, further suggesting this may be a reason for use of that source (Capler, Walsh, et al., 2017). Within the Levesque model, the availability of effective strains and products for inflammation from certain sources would encourage access from those sources, thus impacting the perception of need and desire for care stage of access. Future research should evaluate which cannabis strains and modes of administration are most effective for various conditions and symptoms, including inflammation, and policies should ensure they are available from legal sources.

4.4.3 Important characteristics of cannabis products and services

These findings demonstrate that individuals who access medical cannabis from only legal sources and those who access medical cannabis from illegal as well as legal sources diverged significantly in the value they placed on various characteristics related to cannabis products and services, in general (i.e., not in relation to specific sources). In the context of the Levesque model, these values may have impacted the perception of need and desire for care stage of access, by encouraging some authorized medical cannabis users to access cannabis outside of the legal cannabis sources available to them, despite risk of criminal repercussions.

4.4.3.1 Variety of cannabis strains

Access to a variety of strains was considered important by most individuals in both source status groups. This coincides with findings from a previous survey of 100 MMAR authorized patients, in which 97% indicated they would prefer to obtain cannabis from a source that offers multiple strains (Lucas, 2012). In a study of 628 individuals using cannabis within and outside the MMAR, Belle-Isle et al. (2014)
reported 93% of study participants identified access to a variety of strains as an important option. The lower emphasis placed on access to a variety of strains by those accessing only legal sources in this study may explain why this group did not venture beyond legal sources. Individuals for whom strain variety is more important may have been better served by using many different sources, including illegal ones. Some illegal sources (i.e., dispensaries) have been reported to offer a greater variety of strains than legal sources (Bottorff et al., 2013; Capler et al., 2013). By contrast, LPs were newly established at the time of this study and, therefore, may not have yet been able to offer a wide variety of strains.

4.4.3.2 pesticide-free cannabis

Access to pesticide-free cannabis was considered important by a high proportion of individuals in both source status groups. This finding concurs with a cross-sectional study of 100 medical cannabis patients authorized under the MMAR, of which 81% reported that they would prefer certified organic methods of cultivation (Lucas, 2012). The fact that legal sources, including LPs and personal production, offered the most certainty about what products were used in the cultivation process, would suggest that those in the legal only status group might have placed a higher value on pesticide-free cannabis; however, this was not the case. It is possible that those who produce their own cannabis legally may also use illegal sources as a supplement between crops or in case of crop failure, or to increase their access to a variety of strains. Given the high prevalence of dispensary use in the current study (32.1%), and the variety of strains they provide, this is likely a source accessed in such circumstances.
Of note, concern has been raised about the use of pesticides on cannabis sourced from both LPs and dispensaries in Canada (Brown, 2017a; M. Miller & Looi, 2017; Robertson & McArthur, 2016). Dispensaries, due to their illegal status in Canada have historically been unregulated, and unable to access laboratories to test the products they distribute. Despite the lack of regulations and testing, patients have indicated that they trust the quality of the cannabis acquired from dispensaries in Canada and cannabis social clubs in other jurisdictions (Belackova et al., 2016; Bottorff, Balneaves, Buxton, & Oliffe, 2011; Decorte, 2015). Regarding LPs, the MMPR, and the more recent ACMPR, specify which pesticides are permitted for use and the allowable residue limits (Health Canada, 2013, 2016a). However, despite these regulations, concerns about pesticide use on cannabis from LPs continue, in part because the MMPR and ACMPR have made testing optional, and it was discovered upon inspection that not all LPs were complying with the regulations (Hager, 2017; Robertson, 2017). National associations of LPs and dispensaries have both announced that they are implementing testing requirements for their members (Canadian Association of Medical Cannabis Dispensaries, 2017a; Israel, 2017). Interestingly, packaging regulations for LPs focus on standardized levels of cannabinoids (Brown, 2017b), however, in the current study, participants indicated this was relatively less important than pesticides.

4.4.3.3 ability to select strains and dosage, observe and smell before purchase, and purchase small quantities

Being able to select strains and dosage, observe and smell the cannabis before purchase, and purchase small quantities were considered significantly less important to the legal only source status group. These characteristics, related to the manner in
which cannabis is accessed, highlight some of the major differences between legal and illegal sources. For example, concerning dosage, MMAR and MMPR regulations required healthcare practitioners to specify the daily quantities their patients were permitted to access through legal sources. In contrast, most illegal sources did not require documentation from healthcare providers, and those that did (i.e., dispensaries) typically did not require an indication of an exact dosage. In this way, illegal sources may provide a higher level of autonomy to those using cannabis for medical purposes. It has been suggested in previous research that individuals who access illegal sources may value this level of autonomy in their health care, in particular with a substance that is considered relatively easy and safe to self-titrate (Bottorff, Bissell, et al., 2011; Fainzang, 2013; Hanna & Hughes, 2011). Additionally, some legally authorized patients may use illegal sources to supplement the dosages they are permitted to purchase from legal sources, for example due to limits on amounts authorized by their healthcare practitioner.

With respect to being able to observe and smell products before purchase, illegal sources of medical cannabis often provide a face-to-face context, which facilitates these preferences. In contrast, patients accessing cannabis through the mail from LPs or Health Canada’s supplier must make selections based on images and descriptions provided online. Visual and olfactory inspection provides valuable information to patients about the potential effects of strains. For example, it is now understood that terpenes, which provide the characteristic smell of cannabis, vary by type and amount across different strains and may be responsible, in part, for the different effects (Blasco-Benito et al., 2018; M. A. Lewis et al., 2018; Russo, 2011; Russo & Marcu, 2017; Russo & McPartland, 2003; Sawler et al., 2015). The ability to purchase
cannabis in small quantities is also a more prominent trait of illegal sources. For example, LPs stipulate a minimum amount that can be ordered (e.g., 15 grams). In contrast, many illegal sources provide options for sales in various gram or monetary denominations. This is especially important for low-income patients who cannot afford to purchase larger quantities, and we have seen from other research and court cases that affordability is a barrier to access (Allard et al. v. Canada, 2016; Belle-Isle et al., 2014; Belle-Isle & Hathaway, 2007). In addition, some individuals may find this characteristic important as it allows them to try small amounts of different strains in order to ascertain those that best meet their needs. The importance of these characteristics may explain why some authorized medical cannabis users access cannabis from illegal sources.

4.4.3.4 mail-order, pharmacies and dispensaries

Regarding venues of cannabis access, neither mail-order nor pharmacy access were considered highly important by either source status group. Mail-order was the only option available for LPs, and is also available for some illegal sources, such as dispensaries. Access in a pharmacy was not available at the time of the survey, however, it was an option previously considered by legislators in Canada (Thaczuk, 2004), and is currently being proposed by pharmacies in Canada concurrent with cannabis legalization for recreational purposes (Almorza, 2017; Nieto, 2016; The Canadian Press, 2016). Pharmacies are the main locus of access for medical cannabis in other countries, including Uruguay, Germany, Italy, Israel, Switzerland, and Croatia (Efrati, 2016; Kilmer & Pacula, 2017; Malm, 2016; Miranda, 2017; Pavlic, 2016; Staff, 2017; The Local, 2016). It is possible that access from pharmacies will be considered more important once this avenue is established in Canada. Dispensaries,
being illegal, were not accessed by the legal only source group; unsurprisingly availability from a dispensary was considered significantly less important to individuals in the legal only source status group. Dispensaries also possess many of the characteristics that were considered less important by the legal only source group (e.g., access to a variety of strains, ability to select strain and dosage, ability to observe and smell the products, and availability in small quantities), suggesting that this may be a reason these participants have not pursued access from this source. Conversely, these participants may not consider such characteristics to be important because they have not experienced them.

4.4.4 Satisfaction with legal and illegal sources

The second part of the analysis looked at how all legally authorized participants perceived the quality of various dimensions of cannabis products and services offered by the legal and illegal sources they used (i.e., their satisfaction). The Levesque model addresses satisfaction at the consequence stage of access, which is impacted by the appropriateness of the healthcare service provided. As noted by Leveque et. al (2013), receiving a service that is not considered appropriate by the patient would restrict access, therefore satisfaction is an important determinant of reasonable access. In addition, it is likely that satisfaction with a source would feed back into the perception of need and desire for care stage of access, impacting future decisions to use that source.

4.4.4.1 product satisfaction, affordability, overall satisfaction

While there were no statistically significant differences between legal and illegal sources of cannabis for product satisfaction, there was wide variability in
satisfaction ratings within legal and illegal sources. Regarding product satisfaction ratings for individual sources, it appears that whether legal or illegal, sources closest to production (i.e., personal and designated production), and those focused on medical cannabis patients (i.e., dispensaries) were perceived to provide products that best met patients’ needs. This was not the case however for Health Canada’s supplier and LPs, despite their role as producers and their focus on medical cannabis, which may reflect the fact that the regulations they operated under restricted their ability to provide higher quality products. Indeed, Health Canada’s supplier was beset by regulations that impeded the production of more than one strain of cannabis, dictated the potency and required that it be provided in a milled form (Beeby, 2003). Patients have historically reported a high level of dissatisfaction with the product available from this source. Research has indicated that among patients who were authorized under the MMAR and had tried that source, 75% rated it poor or very poor (Lucas, 2012). Medical cannabis patient organizations have also expressed dissatisfaction with the product available from this source, including its quality and potency, as well as claims about the potential presence of heavy metals and biological contamination, and use of gamma irradiation (Canadians for Safe Access, 2005). While LPs did not have regulatory restrictions on the presentation or potency of dried cannabis under the MMPR, this study spanned the early stages of their operation, which may have impeded the quality and variety of cannabis they had available at the time. It would be of interest to learn how satisfaction ratings on these dimensions have changed over time, with over 90 LPs now providing a greater variety of product choice.

In terms of affordability, the highest satisfaction with affordability also appears to be for sources closest to production, where there was no ‘middle person’ (i.e.,
personal production without a license, designated producer and personal production with a license). Capler et al. (2017) identified similar findings in a study that assessed satisfaction with different sources of medical cannabis in Canada prior to the implementation of the MMPR. Unfamiliar street sources may have several layers between the producer and the vender, which could increase the price charged to patients. In contrast, Health Canada’s supplier and LPs act as both producers and vendors, yet they were still associated with lower satisfaction in relation to affordability. This finding suggests that the medical cannabis regulations did not address affordability in relation to these legal sources. For example, an evaluation of Health Canada’s contract with its supplier under the MMAR indicated a 1,500% mark-up on the price of cannabis charged to patients, accounting for inefficiencies and capital upgrades for the private company (Capler, 2007). Likewise, LPs have incurred high overhead costs to comply with regulations, as well as costs associated with preparations to supply the future legal recreational market, which could also keep prices high for patients. Additionally, with many LPs beholden to corporate shareholders, their focus must ultimately be on profits, which provides little incentive for lowering prices (Collins, 2016; Freeman, 2017; Lindeman, 2015; Weimart, 2017). The lack of affordability of cannabis from LPs under the MMPR led to the court declaring its unconstitutionality (Allard et al. v. Canada, 2016), and the creation of the ACMPR, which reinstated personal and designated production as more affordable options.

The finding that the highest overall satisfaction ratings were for the most affordable legal sources (i.e., legal designated and personal production), suggests that although access is impacted by affordability at the utilization stage of access, it also
impacts overall satisfaction at the consequence stage of access. The affordability of personal production may explain why this was the most accessed source in the present study. Dispensaries on the other hand, appear to be highly accessed by those with legal authorization despite their lack of affordability. In a study examining access to different sources of medical cannabis before the implementation of the MMPR, dispensaries were rated equally or more favourably than other sources on all parameters, except cost (Capler, Walsh, et al., 2017). Similarly, a study of dispensaries in California reported high satisfaction on various dimensions of services, except cost (Reiman, 2007). These findings suggest that although dispensaries were illegal and not rated highly for affordability, there were other compelling reasons for patients choosing to access them.

4.4.4.2 quality of care, expertise and support, and administration and accessibility

Differences between legal and illegal sources, as distinct groups, emerged on all service-related satisfaction ratings, despite disparate ratings within each group. Illegal sources, as a group, received significantly higher ratings for perceived quality of care, expertise and support, and administration and accessibility. Designated producers were the only highly rated legal source for service-related factors. It should be noted that ratings for quality of care, and expertise and support, were not sought in relation to personal production with a license and personal production without a license, since it was believed that these dimensions would be difficult to rate for sources that pertained to oneself. It is unclear how scores for these sources might have affected the group outcomes for these dimensions, since personal production with a license was the most accessed legal source; however, their inclusion in ratings for
satisfaction with administration and accessibility nonetheless resulted in a higher rating for illegal sources.

In the present study, sources dedicated to medical cannabis patients and those that provided personalized in-person service, whether legal or illegal, rated highest for service-related dimensions. This included personal production with a license, friends and dispensaries. A study exploring access to cannabis before the implementation of the MMPR also found that patients gave the highest ratings to sources that focused specifically on providing cannabis for medical purposes, suggesting such specialized sources may best meet patient needs (Capler, Walsh, et al., 2017). Previous studies have reported low satisfaction with service provided by Health Canada’s supplier under the MMAR, which did not provide personalized in-person service. Access to this source was also mediated by the government, which experienced challenges with the timeliness of applications, impersonal employees, and lack of ability to provide support to clients (Lucas, 2012). In contrast, another Canadian study reported that dispensaries, which do provide in-person service, were equally or more favourably evaluated on service related dimensions, including safety, efficiency, and feeling respected compared to other sources (Capler, Walsh, et al., 2017). A study of dispensaries in California also reported high satisfaction with service-related dimensions (Reiman, 2007, 2008). A qualitative study of Canadian dispensaries proffered that medical cannabis users valued the support and sense of community provided by dispensaries (Hathaway & Rossiter, 2007). These studies suggest that service-related factors may have impacted the choice of authorized medical cannabis patients to use this illegal source of cannabis.
Of note, the most poorly rated sources across all service and product dimensions were also the least accessed (i.e., Health Canada’s supplier and street sources). A Canadian cross-sectional study of medical cannabis users and sources conducted prior to the implementation of the MMPR demonstrated a similar pattern of lower use of sources with the lowest satisfaction ratings (Capler, Walsh, et al., 2017). However, in that study, as in the current one, the most highly rated sources (i.e., designated producer, close friend/family) were not necessarily the most commonly accessed. Of particular interest, in the present study, LPs were the third most highly accessed source; however, their satisfaction ratings across all dimensions were relatively low. The high number of individuals accessing this source, despite the relatively low ratings, indicate that individuals who have access to legal sources do avail themselves of those sources, suggesting that the legality of the source is an important consideration. Future research will tell us whether perceived quality ratings on service-related dimensions have improved for LPs as they better establish themselves. In the meantime, enrollment rates in the legal program are increasing along with the burgeoning number of LPs; the latest figures show over 260,000 individuals had registered with an LP by the end of 2017 (Health Canada, 2018c).

4.4.5 Implications and limitations

These findings have implications for policies, programs and research related to the medical use of cannabis in Canada. First, these findings confirm that a substantial portion of patients who had obtained authorization to use cannabis legally was still choosing to access cannabis through illegal sources. This indicates that beyond barriers to accessing authorization in the legal medical cannabis program in Canada, there were barriers to accessing a legal supply that meets patients’ needs. This must
be addressed if the goals of ensuring reasonable access to legal sources, and deterring the use of illegal sources, are to be achieved. Second, regulations must support the inclusion in the legal market of the source characteristics that are important to patients. For example, the development and implementation of production standards that address concerns about pesticides and fertilizers, and distribution policies that permit storefront sales that allow patients to inspect products before purchase, facilitate purchase of smaller quantities of cannabis, encourage a larger variety of strains, and foster patient autonomy in selecting strains and dosages are needed to support access to legal sources. Third, it appears from the findings related to patient satisfaction with different dimensions of legal and illegal sources, that sources closest to production, those focused on medical cannabis patients, and those that provide in-person and personalized care, are perceived to best meet patients’ needs. These findings can inform policy-makers as they consider how to support the use of legal sources in relation to both medical and recreational cannabis. Finally, it is vital that assessments of access to sources of cannabis for medical purposes include patients’ perspectives.

This study has several limitations. As noted in Chapter 3 (Section 3.4.6), there are limitations related to the online cross-sectional design of this study, as well as sampling and recruitment techniques. Causal and temporal inferences cannot be made about the relationship between patient- and system-related factors and ‘source status’. This study involved multiple statistical comparisons, and while many factors were found to reach statistical significance at $p < .05$ and $p < .01$, it is possible that some of these may have occurred by chance. As a result of the online administration of the survey and recruitment through specific medical condition originations and medical
cannabis networks, and the lack of confirmation of diagnosis by a physician, the sample may not be representative of the Canadian population legally accessing medical cannabis. Response biases, including recall and social desirability biases, may have also influenced the results. Additionally, it is possible that unmeasured factors may be associated with the use of only legal or illegal sources, and there may be other dimensions of medical cannabis products and services that are relevant to satisfaction that we did not consider. Strengths of this research include adherence to standards for reporting Internet-based surveys (Eysenbach, 2004), as well as the use of a patient-centred theoretical framework of access to health services, involvement of community and academic experts in the development of the survey, and the inclusion of patient- and system-related factors associated with sources that were identified in previous research.

It should also be noted that in the first part of the analysis, the grouping together of participants who used both illegal and legal sources of cannabis with those using only illegal sources and comparing them to participants using only legal sources may have contributed to the lack of significant differences between these groups. Future research comparing those using legal and illegal sources should include separate groups for those using one or the other, or both types of sources. Additionally, in the second part of the analysis, the grouping together of all legal sources and all illegal sources made comparisons between these groups difficult due to the wide variability of individual sources within each group. Future studies of satisfaction with legal and illegal sources should take into account the diversity of sources within these groups, perhaps singling out those that are most widely used (i.e., personal production with a license and dispensaries). Another potential
limitation was the lack of verification of the sources used by participants. Together, these limitations require the associations between factors and source status and comparisons of ratings for legal and illegal sources to be interpreted with caution, pending replication from research that employs a more systematic recruitment approach, includes physician confirmation of diagnosis, more refined groupings of patients and cannabis sources used, and verification of sources used.

In sum, this study found that a substantial portion of participants who had obtained authorization to use cannabis legally was nevertheless choosing to access cannabis through illegal sources. This indicates that beyond barriers to accessing authorization through the legal medical cannabis program in Canada, there are barriers to accessing a legal supply. Those accessing from illegal sources do not differ significantly from those accessing only legal sources in terms of sociodemographic or medical conditions. However, these findings suggest that certain valued qualities of cannabis products and services were more easily accessed through illegal sources at the time of this study and may explain why some participants used sources beyond those legally available to them. Highest satisfaction ratings were given to sources closest to production and those providing personalized in-person service. Illegal sources as a group were rated significantly higher than legal sources on service dimensions, also highlighting the importance of personalized service. It appears that affordability may be the major factor in deciding which source is used; however, cost being equal, products and services may be more of a deciding factor than whether the source is legal or illegal. Patients’ perceptions of the quality of services is important to consider in the assessment of access to medical cannabis; receiving a service that is not considered appropriate by a patient, even if through a legal source, does not
constitute reasonable access. Satisfaction, as an outcome of a patients’ access experience at the consequences stage of access in the Levesque model, may impact future decisions to access cannabis through legal sources at the perception of need and desire for care stage of access. These findings provide insight into the reasons why patients who have obtained authorization to access legal sources of cannabis chose to purchase from illegal sources, and highlight features of illegal sources that were valued. It is recommended that these features be incorporated into the legal system to deter use of illegal sources. This study was conducted in the early stages of the MMPR and prior to the implementation of the ACMPR. Future patient-centred research is required to assess the impact of the ACMPR, and the increased number of LPs and potential improvements in their operational practices since the time of the study on patient access to legal sources. It will also be important to monitor the impact of legalization of recreational cannabis on patients’ use of legal and illegal sources of cannabis.
Table 4.1 Descriptive statistics of use of different cannabis sources stratified by authorization status (n = 237)*

<table>
<thead>
<tr>
<th>Sources</th>
<th>MMAR n (%)</th>
<th>MMPR n (%)</th>
<th>Total n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 178</td>
<td>n = 59</td>
<td>n = 237</td>
</tr>
<tr>
<td><strong>Legal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Canada supplier</td>
<td>21 (11.8)</td>
<td>2 (3.4)</td>
<td>23 (9.7)</td>
</tr>
<tr>
<td>Designated producer</td>
<td>28 (15.7)</td>
<td>6 (10.2)</td>
<td>34 (14.3)</td>
</tr>
<tr>
<td>Personal production (with license)</td>
<td>92 (51.7)</td>
<td>5 (8.5)</td>
<td>97 (40.9)</td>
</tr>
<tr>
<td>Licensed producer (LP)</td>
<td>22 (12.4)</td>
<td>41 (69.5)</td>
<td>63 (26.6)</td>
</tr>
<tr>
<td><strong>Illegal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical cannabis dispensary</td>
<td>59 (33.1)</td>
<td>17 (28.8)</td>
<td>76 (32.1)</td>
</tr>
<tr>
<td>Personal production (without license)</td>
<td>8 (4.5)</td>
<td>3 (5.1)</td>
<td>11 (4.6)</td>
</tr>
<tr>
<td>Close friend/family</td>
<td>20 (11.2)</td>
<td>9 (15.3)</td>
<td>29 (12.2)</td>
</tr>
<tr>
<td>Acquaintance/dealer</td>
<td>30 (16.9)</td>
<td>8 (13.6)</td>
<td>38 (16.0)</td>
</tr>
<tr>
<td>Unfamiliar street source</td>
<td>10 (5.6)</td>
<td>-</td>
<td>10 (4.2)</td>
</tr>
</tbody>
</table>

MMAR: Marihuana Medical Access Regulations; MMPR: Marihuana for Medical Purposes Regulations

* Respondents were able to select more than one source
Table 4.2 Descriptive statistics and bivariate logistic regression analyses of sociodemographic factors associated with source status (n = 237)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Legal only n (%)</th>
<th>Illegal‡ n (%)</th>
<th>Unadjusted OR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 119</td>
<td>n = 118</td>
<td></td>
</tr>
<tr>
<td><strong>Sociodemographic factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Median age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥48</td>
<td>65 (54.6)</td>
<td>58 (49.2)</td>
<td>1.25 (0.75 – 2.07)</td>
</tr>
<tr>
<td>&lt;48</td>
<td>54 (45.4)</td>
<td>60 (50.8)</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>female</td>
<td>49 (41.2)</td>
<td>42 (35.6)</td>
<td>1.27 (0.75 – 2.14)</td>
</tr>
<tr>
<td>male</td>
<td>70 (58.8)</td>
<td>76 (64.4)</td>
<td></td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>103 (86.6)</td>
<td>100 (84.7)</td>
<td>1.16 (0.56 – 2.40)</td>
</tr>
<tr>
<td>other</td>
<td>16 (13.4)</td>
<td>18 (15.3)</td>
<td></td>
</tr>
<tr>
<td><strong>Residence</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>urban/suburban</td>
<td>81 (68.1)</td>
<td>90 (76.3)</td>
<td>0.66 (0.37 – 1.18)</td>
</tr>
<tr>
<td>rural</td>
<td>38 (31.9)</td>
<td>28 (23.7)</td>
<td></td>
</tr>
<tr>
<td><strong>Province</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ontario</td>
<td>46 (38.7)</td>
<td>46 (39.0)</td>
<td>reference</td>
</tr>
<tr>
<td>British Columbia</td>
<td>35 (29.4)</td>
<td>32 (27.1)</td>
<td>1.09 (0.58 – 2.05)</td>
</tr>
<tr>
<td>Prairie</td>
<td>17 (14.3)</td>
<td>24 (20.3)</td>
<td>0.71 (0.34 – 1.49)</td>
</tr>
<tr>
<td>Quebec</td>
<td>4 (3.4)</td>
<td>8 (6.8)</td>
<td>0.50 (0.14 – 1.78)</td>
</tr>
<tr>
<td>Atlantic</td>
<td>17 (14.3)</td>
<td>8 (6.8)</td>
<td>2.12 (0.83 – 5.41)</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;$20,000</td>
<td>39 (32.8)</td>
<td>34 (28.8)</td>
<td>1.20 (0.69 – 2.09)</td>
</tr>
<tr>
<td>≥$20,000</td>
<td>80 (67.2)</td>
<td>84 (71.2)</td>
<td></td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>employed†</td>
<td>44 (37.0)</td>
<td>46 (39.0)</td>
<td>0.92 (0.54 – 1.55)</td>
</tr>
<tr>
<td>other</td>
<td>75 (63.0)</td>
<td>72 (61.0)</td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥post-secondary</td>
<td>92 (77.3)</td>
<td>87 (73.7)</td>
<td>1.21 (0.67 – 2.20)</td>
</tr>
<tr>
<td>&lt;post-secondary</td>
<td>27 (22.7)</td>
<td>31 (26.3)</td>
<td></td>
</tr>
<tr>
<td><strong>Authorization status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMAR</td>
<td>87 (48.9)</td>
<td>91 (51.1)</td>
<td>1.24 (0.69 – 2.24)</td>
</tr>
<tr>
<td>MMPR</td>
<td>32 (54.2)</td>
<td>27 (45.8)</td>
<td></td>
</tr>
</tbody>
</table>

OR: odds ratio; CI: confidence interval

* = p < 0.05

‡ Illegal source status includes individuals using both legal and illegal sources, or only illegal sources

† employed includes: full-time, part-time, casual, and self-employment
Table 4.3 Descriptive statistics and bivariate logistic regression analyses of health-related factors associated with source status (n = 237)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Legal only n (%)</th>
<th>Illegal‡ n (%)</th>
<th>Unadjusted OR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Medical conditions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>85 (71.4)</td>
<td>82 (69.5)</td>
<td>1.10 (0.63 – 1.92)</td>
</tr>
<tr>
<td>no</td>
<td>34 (28.6)</td>
<td>36 (30.5)</td>
<td></td>
</tr>
<tr>
<td>Arthritis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>56 (47.1)</td>
<td>47 (39.8)</td>
<td>1.34 (0.80 – 2.25)</td>
</tr>
<tr>
<td>no</td>
<td>63 (52.9)</td>
<td>71 (60.2)</td>
<td></td>
</tr>
<tr>
<td>Mental health</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>44 (37.0)</td>
<td>51 (43.2)</td>
<td>0.77 (0.46 – 1.30)</td>
</tr>
<tr>
<td>no</td>
<td>75 (63.0)</td>
<td>67 (56.8)</td>
<td></td>
</tr>
<tr>
<td>Respiratory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>25 (21.0)</td>
<td>23 (19.5)</td>
<td>1.10 (0.58 – 2.07)</td>
</tr>
<tr>
<td>no</td>
<td>94 (79.0)</td>
<td>95 (80.5)</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>24 (20.2)</td>
<td>24 (20.3)</td>
<td>0.99 (0.53 – 1.86)</td>
</tr>
<tr>
<td>no</td>
<td>95 (79.8)</td>
<td>94 (79.7)</td>
<td></td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>19 (16.0)</td>
<td>22 (18.6)</td>
<td>0.83 (0.42 – 1.63)</td>
</tr>
<tr>
<td>no</td>
<td>100 (84.0)</td>
<td>96 (81.4)</td>
<td></td>
</tr>
<tr>
<td>Cardiovascular</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>18 (15.1)</td>
<td>16 (13.6)</td>
<td>1.14 (0.55 – 2.35)</td>
</tr>
<tr>
<td>no</td>
<td>101 (84.9)</td>
<td>102 (86.4)</td>
<td></td>
</tr>
<tr>
<td>Nervous system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>18 (15.1)</td>
<td>28 (23.7)</td>
<td>0.57 (0.30 – 1.10)†</td>
</tr>
<tr>
<td>no</td>
<td>101 (84.9)</td>
<td>90 (76.3)</td>
<td></td>
</tr>
<tr>
<td>Endocrine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>14 (11.8)</td>
<td>14 (11.9)</td>
<td>0.99 (0.45 – 2.18)</td>
</tr>
<tr>
<td>no</td>
<td>105 (88.2)</td>
<td>104 (88.1)</td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>9 (7.6)</td>
<td>7 (5.9)</td>
<td>1.30 (0.47 – 3.61)</td>
</tr>
<tr>
<td>no</td>
<td>110 (92.4)</td>
<td>111 (94.1)</td>
<td></td>
</tr>
<tr>
<td>HIV / AIDS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>5 (4.2)</td>
<td>6 (5.1)</td>
<td>0.82 (0.24 – 2.76)</td>
</tr>
<tr>
<td>no</td>
<td>114 (95.8)</td>
<td>112 (94.9)</td>
<td></td>
</tr>
</tbody>
</table>

OR: odds ratio; CI: confidence interval

* = p < 0.05; † = p < 0.10

‡ Illegal source status includes individuals using both legal and illegal sources, or only illegal sources
Table 4.3 Descriptive statistics and bivariate logistic regression analyses of health-related factors associated with source status (n = 237) (continued)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Legal only n (%)</th>
<th>Illegal† n (%)</th>
<th>Unadjusted OR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reasons for use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain relief</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>109 (91.6)</td>
<td>110 (93.2)</td>
<td>0.79 (0.30 – 2.08)</td>
</tr>
<tr>
<td>no</td>
<td>10 (8.4)</td>
<td>8 (6.8)</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>80 (67.2)</td>
<td>83 (70.3)</td>
<td>0.86 (0.50 – 1.50)</td>
</tr>
<tr>
<td>no</td>
<td>39 (32.8)</td>
<td>35 (29.7)</td>
<td></td>
</tr>
<tr>
<td>Mental health</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>72 (60.5)</td>
<td>72 (61.0)</td>
<td>0.98 (0.58 – 1.65)</td>
</tr>
<tr>
<td>no</td>
<td>47 (39.5)</td>
<td>46 (39.0)</td>
<td></td>
</tr>
<tr>
<td>Nausea &amp; vomiting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>58 (48.7)</td>
<td>58 (49.2)</td>
<td>0.98 (0.59 – 1.64)</td>
</tr>
<tr>
<td>no</td>
<td>61 (51.3)</td>
<td>60 (50.8)</td>
<td></td>
</tr>
<tr>
<td>Well-being</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>58 (48.7)</td>
<td>70 (59.3)</td>
<td>0.65 (0.39 – 1.10)</td>
</tr>
<tr>
<td>no</td>
<td>61 (51.3)</td>
<td>48 (40.7)</td>
<td></td>
</tr>
<tr>
<td>Inflammation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>50 (42.0)</td>
<td>67 (56.8)</td>
<td>0.55 (0.33 – 0.92)*</td>
</tr>
<tr>
<td>no</td>
<td>69 (58.0)</td>
<td>51 (43.2)</td>
<td></td>
</tr>
<tr>
<td>Loss of appetite &amp; weight loss</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>44 (37.0)</td>
<td>49 (41.5)</td>
<td>0.83 (0.49 – 1.39)</td>
</tr>
<tr>
<td>no</td>
<td>75 (63.0)</td>
<td>69 (58.5)</td>
<td></td>
</tr>
<tr>
<td>Spasms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>15 (12.6)</td>
<td>17 (14.4)</td>
<td>0.86 (0.41 – 1.81)</td>
</tr>
<tr>
<td>no</td>
<td>104 (87.4)</td>
<td>101 (85.6)</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>11 (9.2)</td>
<td>18 (15.3)</td>
<td>0.57 (0.25 – 1.26)</td>
</tr>
<tr>
<td>no</td>
<td>108 (90.8)</td>
<td>100 (84.7)</td>
<td></td>
</tr>
</tbody>
</table>

OR: odds ratio; CI: confidence interval

* = p <0.05; † = p <0.10

† Illegal source status includes individuals using both legal and illegal sources, or only illegal sources
Table 4.4 Multivariate logistic regression analyses of sociodemographic and health-related factors associated with source status (n = 237)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Adjusted OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health status factors: medical conditions</strong></td>
<td></td>
</tr>
<tr>
<td>Nervous system (yes vs. no)</td>
<td>0.53 (0.27 – 1.02)</td>
</tr>
<tr>
<td><strong>Health status factors: reasons for use</strong></td>
<td></td>
</tr>
<tr>
<td>Inflammation (yes vs. no)</td>
<td>0.53 (0.31 – 0.88)*</td>
</tr>
</tbody>
</table>

OR: odds ratio; CI: confidence interval

* = p <0.05
Table 4.5 Descriptive statistics and bivariate logistic regression analyses of important characteristics and sources status (n = 237)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Legal only n (%)</th>
<th>Illegal(^\d) n (%)</th>
<th>Unadjusted OR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to preferred strains</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>105 (88.2)</td>
<td>103 (87.3)</td>
<td>1.09 (0.50 – 2.38)</td>
</tr>
<tr>
<td>No</td>
<td>14 (11.8)</td>
<td>15 (12.7)</td>
<td></td>
</tr>
<tr>
<td>Access to a variety of products</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>100 (84.0)</td>
<td>99 (83.9)</td>
<td>1.01 (0.50 – 2.02)</td>
</tr>
<tr>
<td>No</td>
<td>19 (16.0)</td>
<td>19 (16.1)</td>
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<tr>
<td>Organically grown</td>
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<td></td>
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<tr>
<td>Yes</td>
<td>96 (80.7)</td>
<td>88 (74.6)</td>
<td>1.42 (0.77 – 2.63)</td>
</tr>
<tr>
<td>No</td>
<td>23 (19.3)</td>
<td>30 (25.4)</td>
<td></td>
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<tr>
<td>Free of pesticides</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>93 (78.2)</td>
<td>105 (89.0)</td>
<td>0.44 (0.22 – 0.91)*</td>
</tr>
<tr>
<td>No</td>
<td>26 (21.8)</td>
<td>13 (11.0)</td>
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<tr>
<td>Access to a variety of strains</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>90 (75.6)</td>
<td>102 (86.4)</td>
<td>0.49 (0.25 – 0.95)*</td>
</tr>
<tr>
<td>No</td>
<td>29 (24.4)</td>
<td>16 (13.6)</td>
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</tr>
<tr>
<td>Provided in trimmed form</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>88 (73.9)</td>
<td>92 (78.0)</td>
<td>0.80 (0.44 – 1.46)</td>
</tr>
<tr>
<td>No</td>
<td>31 (26.1)</td>
<td>26 (22.0)</td>
<td></td>
</tr>
<tr>
<td>Free of microbial contaminants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>85 (71.4)</td>
<td>94 (79.6)</td>
<td>0.64 (0.35 – 1.16)</td>
</tr>
<tr>
<td>No</td>
<td>34 (28.6)</td>
<td>24 (20.3)</td>
<td></td>
</tr>
<tr>
<td>Able to select strain and dosage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>76 (63.9)</td>
<td>104 (88.1)</td>
<td>0.24 (0.12 – 0.47)**</td>
</tr>
<tr>
<td>No</td>
<td>43 (36.1)</td>
<td>14 (11.9)</td>
<td></td>
</tr>
<tr>
<td>Able to observe and smell</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>66 (55.5)</td>
<td>87 (73.7)</td>
<td>0.44 (0.26 – 0.77)**</td>
</tr>
<tr>
<td>No</td>
<td>53 (44.5)</td>
<td>31 (26.3)</td>
<td></td>
</tr>
<tr>
<td>Standardized levels of ingredients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>61 (51.3)</td>
<td>72 (61.0)</td>
<td>0.67 (0.40 – 1.13)</td>
</tr>
<tr>
<td>No</td>
<td>58 (48.7)</td>
<td>46 (39.0)</td>
<td></td>
</tr>
<tr>
<td>Available in large quantities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>59 (49.6)</td>
<td>72 (61.0)</td>
<td>0.63 (0.38 – 1.05)</td>
</tr>
<tr>
<td>No</td>
<td>60 (50.4)</td>
<td>46 (39.0)</td>
<td></td>
</tr>
</tbody>
</table>

OR: odds ratio; CI: confidence interval
\(^* = p <0.05, ** = p <0.01\)
\(^\d\) Illegal source status includes individuals using both legal and illegal sources, or only illegal sources
Table 4.5 Descriptive statistics and bivariate logistic regression analyses of important characteristics and sources status (n = 237) (continued)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Legal only n (%)</th>
<th>Illegal‡ n (%)</th>
<th>Unadjusted OR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sent to home</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>57 (47.9)</td>
<td>61 (51.7)</td>
<td>0.86 (0.52 – 1.43)</td>
</tr>
<tr>
<td>No</td>
<td>62 (52.1)</td>
<td>57 (48.3)</td>
<td></td>
</tr>
<tr>
<td><strong>Available in a dispensary</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>52 (43.7)</td>
<td>92 (78.0)</td>
<td>0.22 (0.12 – 0.39)**</td>
</tr>
<tr>
<td>No</td>
<td>67 (56.3)</td>
<td>26 (22.0)</td>
<td></td>
</tr>
<tr>
<td><strong>Available in small quantities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>51 (42.9)</td>
<td>73 (61.9)</td>
<td>0.46 (0.28 – 0.78)**</td>
</tr>
<tr>
<td>No</td>
<td>68 (57.1)</td>
<td>45 (38.1)</td>
<td></td>
</tr>
<tr>
<td><strong>Available in a pharmacy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>38 (31.9)</td>
<td>49 (41.5)</td>
<td>0.66 (0.39 – 1.12)</td>
</tr>
<tr>
<td>No</td>
<td>81 (68.1)</td>
<td>69 (58.5)</td>
<td></td>
</tr>
<tr>
<td><strong>Provided in milled form</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10 (8.4)</td>
<td>5 (4.2)</td>
<td>2.07 (0.69 – 6.26)</td>
</tr>
<tr>
<td>No</td>
<td>109 (91.6)</td>
<td>113 (95.8)</td>
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</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9 (7.6)</td>
<td>12 (10.2)</td>
<td>0.72 (0.29 – 1.79)</td>
</tr>
<tr>
<td>No</td>
<td>110 (92.4)</td>
<td>106 (89.8)</td>
<td></td>
</tr>
</tbody>
</table>

OR: odds ratio; CI: confidence interval
* = p <0.05, ** = p <0.01
‡ Illegal source status includes individuals using both legal and illegal sources, or only illegal sources
Table 4.6 Summary statistics of product satisfaction scores for different sources (n=237)

<table>
<thead>
<tr>
<th>Sources</th>
<th>Overall Product Satisfaction</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Canada supplier (n = 23)</td>
<td>2.61</td>
<td>2.00</td>
<td>1.00 – 4.00</td>
<td></td>
</tr>
<tr>
<td>Designated producer (n = 34)</td>
<td>4.62</td>
<td>5.00</td>
<td>4.25 – 5.00</td>
<td></td>
</tr>
<tr>
<td>Personal production (with license) (n = 97)</td>
<td>4.57</td>
<td>5.00</td>
<td>4.00 – 5.00</td>
<td></td>
</tr>
<tr>
<td>Licensed producer (n = 63)</td>
<td>3.70</td>
<td>4.00</td>
<td>3.00 – 4.50</td>
<td></td>
</tr>
<tr>
<td>Medical cannabis dispensary (n = 76)</td>
<td>4.28</td>
<td>5.00</td>
<td>4.00 – 5.00</td>
<td></td>
</tr>
<tr>
<td>Personal production (no license) (n = 11)</td>
<td>4.55</td>
<td>5.00</td>
<td>4.00 – 5.00</td>
<td></td>
</tr>
<tr>
<td>Close friend/family (n = 29)</td>
<td>4.24</td>
<td>4.00</td>
<td>4.00 – 5.00</td>
<td></td>
</tr>
<tr>
<td>Acquaintance/dealer (n = 38)</td>
<td>3.63</td>
<td>4.00</td>
<td>3.00 – 4.00</td>
<td></td>
</tr>
<tr>
<td>Unfamiliar street source (n = 10)</td>
<td>3.30</td>
<td>3.00</td>
<td>3.00 – 4.00</td>
<td></td>
</tr>
</tbody>
</table>

| Presentation | | | | |
| Legal sources | | | | |
| Health Canada supplier (n = 23) | 2.94 | 3.33 | 1.83 – 4.00 |
| Designated producer (n = 34) | 4.52 | 5.00 | 4.00 – 5.00 |
| Personal production (with license) (n = 97) | 4.42 | 5.00 | 4.00 – 5.00 |
| Licensed producer (n = 63) | 3.87 | 4.00 | 3.33 – 4.50 |
| Medical cannabis dispensary (n = 76) | 4.29 | 4.33 | 4.00 – 5.00 |
| Personal production (no license) (n = 11) | 4.52 | 4.33 | 4.33 – 5.00 |
| Close friend/family (n = 29) | 4.08 | 4.33 | 3.33 – 4.67 |
| Acquaintance/dealer (n = 38) | 3.58 | 3.67 | 3.00 – 4.00 |
| Unfamiliar street source (n = 10) | 2.83 | 3.00 | 2.42 – 3.00 |

| Potency | | | | |
| Legal sources | | | | |
| Health Canada supplier (n = 23) | 2.61 | 3.00 | 1.50 – 3.00 |
| Designated producer (n = 34) | 4.68 | 5.00 | 4.25 – 5.00 |
| Personal production (with license) (n = 97) | 4.31 | 5.00 | 4.00 – 5.00 |
| Licensed producer (n = 63) | 3.62 | 4.00 | 3.00 – 4.00 |
| Medical cannabis dispensary (n = 76) | 4.33 | 4.50 | 4.00 – 5.00 |
| Personal production (no license) (n = 11) | 4.55 | 5.00 | 4.00 – 5.00 |
| Close friend/family (n = 29) | 4.00 | 4.00 | 3.00 – 5.00 |
| Acquaintance/dealer (n = 38) | 3.68 | 4.00 | 3.00 – 5.00 |
| Unfamiliar street source (n = 10) | 3.20 | 3.00 | 3.00 – 3.75 |

IQR: interquartile range
Table 4.6 Summary statistics of product satisfaction scores for different sources (n=237) (continued)

<table>
<thead>
<tr>
<th>Sources</th>
<th>Strains</th>
<th>mean</th>
<th>median</th>
<th>IQR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Legal sources</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Canada supplier (n = 23)</td>
<td>1.39</td>
<td>1.00</td>
<td>1.00 – 1.25</td>
<td></td>
</tr>
<tr>
<td>Designated producer (n = 34)</td>
<td>4.13</td>
<td>4.50</td>
<td>3.50 – 5.00</td>
<td></td>
</tr>
<tr>
<td>Personal production (with license) (n = 97)</td>
<td>4.07</td>
<td>5.00</td>
<td>3.50 – 5.00</td>
<td></td>
</tr>
<tr>
<td>Licensed producer (n = 63)</td>
<td>2.74</td>
<td>2.50</td>
<td>2.00 – 3.50</td>
<td></td>
</tr>
<tr>
<td><strong>Illegal sources</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical cannabis dispensary (n = 76)</td>
<td>4.17</td>
<td>4.50</td>
<td>3.88 – 5.00</td>
<td></td>
</tr>
<tr>
<td>Personal production (no license) (n = 11)</td>
<td>4.27</td>
<td>5.00</td>
<td>4.50 – 5.00</td>
<td></td>
</tr>
<tr>
<td>Close friend / family (n = 29)</td>
<td>3.07</td>
<td>3.00</td>
<td>2.00 – 4.00</td>
<td></td>
</tr>
<tr>
<td>Acquaintance / dealer (n = 38)</td>
<td>2.65</td>
<td>2.50</td>
<td>2.00 – 3.00</td>
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</tr>
<tr>
<td>Unfamiliar street source (n = 10)</td>
<td>2.15</td>
<td>2.00</td>
<td>1.13 – 2.75</td>
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<table>
<thead>
<tr>
<th>Sources</th>
<th>Products</th>
<th>mean</th>
<th>median</th>
<th>IQR</th>
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<tr>
<td><strong>Legal sources</strong></td>
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</tr>
<tr>
<td>Health Canada supplier (n = 23)</td>
<td>1.35</td>
<td>1.00</td>
<td>1.00 – 1.00</td>
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</tr>
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<td>1.00 – 5.00</td>
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<tr>
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<td>5.00</td>
<td>4.00 – 5.00</td>
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<tr>
<td>Licensed producer (n = 63)</td>
<td>1.49</td>
<td>1.00</td>
<td>1.00 – 1.00</td>
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</tr>
<tr>
<td><strong>Illegal sources</strong></td>
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<tr>
<td>Medical cannabis dispensary (n = 76)</td>
<td>4.01</td>
<td>4.50</td>
<td>3.00 – 5.00</td>
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</tr>
<tr>
<td>Personal production (no license) (n = 11)</td>
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<td>5.00</td>
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<td>Close friend / family (n = 29)</td>
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<tr>
<td>Acquaintance / dealer (n = 38)</td>
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<td>1.00</td>
<td>1.00 – 2.00</td>
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<td>Unfamiliar street source (n = 10)</td>
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<td>1.00 – 1.75</td>
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<table>
<thead>
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<th>IQR</th>
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<td>Health Canada supplier (n = 23)</td>
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<td>5.00 – 5.00</td>
<td></td>
</tr>
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<td>4.43</td>
<td>5.00</td>
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</tr>
<tr>
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<td>3.62</td>
<td>4.00</td>
<td>3.00 – 4.00</td>
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</tr>
<tr>
<td><strong>Illegal sources</strong></td>
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<td></td>
</tr>
<tr>
<td>Medical cannabis dispensary (n = 76)</td>
<td>4.49</td>
<td>5.00</td>
<td>4.00 – 5.00</td>
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</tr>
<tr>
<td>Personal production (no license) (n = 11)</td>
<td>4.91</td>
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<td>4.00</td>
<td>3.00 – 5.00</td>
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IQR: interquartile range
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<th>Quality of Care</th>
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<th>median</th>
<th>IQR</th>
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<tr>
<td>Health Canada supplier (n = 23)</td>
<td>2.08</td>
<td>1.85</td>
<td>1.23 – 3.15</td>
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<td>4.25</td>
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<td>3.70 – 5.00</td>
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</tr>
<tr>
<td>Personal production (with license) (n = n/a)</td>
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<td>n/a</td>
<td>n/a</td>
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<tr>
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<td>4.09</td>
<td>4.15</td>
<td>3.58 – 4.93</td>
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<tr>
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<td>n/a</td>
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<tr>
<td>Close friend / family (n = 29)</td>
<td>4.33</td>
<td>4.50</td>
<td>4.00 – 5.00</td>
<td></td>
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<tr>
<td>Acquaintance / dealer (n = 38)</td>
<td>3.35</td>
<td>3.50</td>
<td>3.00 – 4.18</td>
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<td>2.33</td>
<td>1.50 – 2.65</td>
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<table>
<thead>
<tr>
<th>Sources</th>
<th>Expertise and Support</th>
<th>mean</th>
<th>median</th>
<th>IQR</th>
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<td><strong>Legal sources</strong></td>
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<tr>
<td>Health Canada supplier (n = 23)</td>
<td>2.21</td>
<td>2.00</td>
<td>1.56 – 2.75</td>
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</tr>
<tr>
<td>Designated producer (n = 34)</td>
<td>4.12</td>
<td>4.54</td>
<td>3.53 – 4.97</td>
<td></td>
</tr>
<tr>
<td>Personal production (with license) (n = n/a)</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Licensed producer (n = 63)</td>
<td>3.18</td>
<td>3.25</td>
<td>2.56 – 3.92</td>
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</tr>
<tr>
<td><strong>Illegal sources</strong></td>
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<td></td>
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<tr>
<td>Medical cannabis dispensary (n = 76)</td>
<td>4.01</td>
<td>4.13</td>
<td>3.50 – 4.63</td>
<td></td>
</tr>
<tr>
<td>Personal production (no license) (n = n/a)</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Close friend / family (n = 29)</td>
<td>3.66</td>
<td>3.63</td>
<td>3.00 – 4.14</td>
<td></td>
</tr>
<tr>
<td>Acquaintance / dealer (n = 37)</td>
<td>2.85</td>
<td>3.00</td>
<td>2.25 – 3.38</td>
<td></td>
</tr>
<tr>
<td>Unfamiliar street source (n = 8)</td>
<td>2.27</td>
<td>2.56</td>
<td>1.47 – 3.03</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sources</th>
<th>Administration and Accessibility</th>
<th>mean</th>
<th>median</th>
<th>IQR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Legal sources</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Canada supplier (n = 22)</td>
<td>3.09</td>
<td>3.00</td>
<td>2.68 – 3.79</td>
<td></td>
</tr>
<tr>
<td>Designated producer (n = 34)</td>
<td>4.22</td>
<td>4.88</td>
<td>3.64 – 5.00</td>
<td></td>
</tr>
<tr>
<td>Personal production (with license) (n = 89)</td>
<td>3.56</td>
<td>3.80</td>
<td>2.70 – 4.88</td>
<td></td>
</tr>
<tr>
<td>Licensed producer (n = 63)</td>
<td>3.34</td>
<td>3.50</td>
<td>2.85 – 3.95</td>
<td></td>
</tr>
<tr>
<td><strong>Illegal sources</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical cannabis dispensary (n = 76)</td>
<td>4.13</td>
<td>4.28</td>
<td>3.79 – 4.70</td>
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</tr>
<tr>
<td>Personal production (no license) (n = 9)</td>
<td>4.58</td>
<td>4.67</td>
<td>4.40 – 5.00</td>
<td></td>
</tr>
<tr>
<td>Close friend / family (n = 28)</td>
<td>3.95</td>
<td>3.93</td>
<td>3.33 – 4.74</td>
<td></td>
</tr>
<tr>
<td>Acquaintance / dealer (n = 38)</td>
<td>3.69</td>
<td>3.95</td>
<td>3.10 – 4.40</td>
<td></td>
</tr>
<tr>
<td>Unfamiliar street source (n = 9)</td>
<td>2.51</td>
<td>2.40</td>
<td>1.70 – 3.38</td>
<td></td>
</tr>
</tbody>
</table>

IQR: interquartile range
Table 4.8 Wilcoxon rank sum test comparing legal and illegal sources quality of care, expertise and support, and administration and accessibility scores (n = 237)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Median of mean scores (IQR)</th>
<th>Legal sources</th>
<th>Illegal sources</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of care score</td>
<td></td>
<td>3.67 (2.60 – 4.48)</td>
<td>4.02 (3.40 – 4.60)</td>
<td>0.004</td>
</tr>
<tr>
<td>Expertise and support score</td>
<td></td>
<td>3.25 (2.43 – 4.18)</td>
<td>3.64 (3.13 – 4.34)</td>
<td>0.025</td>
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<tr>
<td>Administration and accessibility score</td>
<td></td>
<td>3.67 (2.80 – 4.50)</td>
<td>4.00 (3.43 – 4.68)</td>
<td>0.008</td>
</tr>
</tbody>
</table>

IQR: interquartile range
### Table 4.9 Summary statistics of affordability and overall satisfaction scores for different sources (n= 237)

<table>
<thead>
<tr>
<th>Sources</th>
<th>Affordability</th>
<th>Overall Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Legal sources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Canada supplier (n = 21)</td>
<td>2.62</td>
<td>2.48</td>
</tr>
<tr>
<td>Designated producer (n = 32)</td>
<td>4.06</td>
<td>4.65</td>
</tr>
<tr>
<td>Personal production (with license) (n = 84)</td>
<td>3.66</td>
<td>4.54</td>
</tr>
<tr>
<td>Licensed producer (n = 63)</td>
<td>2.06</td>
<td>3.21</td>
</tr>
<tr>
<td><strong>Illegal sources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical cannabis dispensary (n = 75)</td>
<td>2.89</td>
<td>4.22</td>
</tr>
<tr>
<td>Personal production (no license) (n = 8)</td>
<td>5.00</td>
<td>4.46</td>
</tr>
<tr>
<td>Close friend/family (n = 26)</td>
<td>3.35</td>
<td>4.28</td>
</tr>
<tr>
<td>Acquaintance/dealer (n = 38)</td>
<td>2.47</td>
<td>3.61</td>
</tr>
<tr>
<td>Unfamiliar street source (n = 9)</td>
<td>1.22</td>
<td>2.60</td>
</tr>
</tbody>
</table>

IQR: interquartile range
Table 4.10 Summary of significant associations between factors and source status/sources

<table>
<thead>
<tr>
<th>Factors</th>
<th>Direction of Association</th>
<th>Source Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reason for use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflammation</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>Characteristics of products/service considered important</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pesticide free</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>Access to variety of strains</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>Ability to select strain/dosage</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>Ability to observe/smell</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>Available in dispensary</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>Available in small quantities</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>Satisfaction Ratings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of care</td>
<td>(+)</td>
<td></td>
</tr>
<tr>
<td>Expertise/support</td>
<td>(+)</td>
<td></td>
</tr>
<tr>
<td>Administration/accessibility</td>
<td>(+)</td>
<td></td>
</tr>
</tbody>
</table>

* Those using only legal sources (n=119)
** Those using both legal and illegal sources, or only illegal sources (n=118)
\(^\dagger\) Legal sources: Health Canada’s supplier, personal production with license, designated producer, LPs
\(^\ddagger\) Illegal sources: personal production without license, dispensary, friend/family, acquaintance/dealer, street sources
Table 4.11 Patient and system factors associated with source status in relation to the Levesque model of access to health care

<table>
<thead>
<tr>
<th>Health care needs</th>
<th>Perception of needs and desire for care</th>
<th>Health care seeking</th>
<th>Health care reaching</th>
<th>Health care Utilization</th>
<th>Health care consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient factors</td>
<td>Ability to perceive</td>
<td>Ability to seek</td>
<td>Ability to reach</td>
<td>Ability to pay</td>
<td>Ability to engage</td>
</tr>
<tr>
<td></td>
<td>Health-related factors:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- reasons for use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Health-related factors:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- reasons for use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>System factors</td>
<td>Approachability</td>
<td>Acceptability</td>
<td>Availability and accommodation</td>
<td>Affordability</td>
<td>Appropriateness</td>
</tr>
<tr>
<td></td>
<td>Important characteristics:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- pesticide free</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- ability to select strain/dosage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- ability to observe/smell</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>- available in dispensary</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- available in small quantities</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
CHAPTER 5: CONSEQUENCES OF THE ACCESS EXPERIENCE ON THE LIVES OF PATIENTS ACCESSING CANNABIS FOR MEDICAL PURPOSES IN CANADA

5.1 Introduction

As described in Section 1.2, regulations for the legal use of cannabis for medical purposes have been carved out of an otherwise criminalized context for cannabis possession, production and distribution in Canada. Beginning in 2001 with the *Marihuana Medical Access Regulations* (MMAR), followed by the *Marihuana for Medical Purposes Regulations* (MMPR) in 2013, and the *Access to Cannabis for Medical Purposes Regulations* (ACMPR) in 2016, the goal of the federal government’s medical cannabis program was to provide reasonable access to cannabis for medical purposes (Government of Canada, 2001, 2013, 2016). There were some significant differences between these regulations, particularly in terms of legal sources of cannabis (See figure 1.1). Despite the existence of a medical cannabis program, the majority of individuals using cannabis for medical purposes in Canada continued to access cannabis outside of the legal framework (Adlaf et al., 2005; Government of Canada, 2017a; Stockwell et al., 2006; Walsh et al., 2013). In addition, many of those authorized under the program were nonetheless accessing cannabis from illegal sources (Belle-Isle et al., 2014; Belle-Isle & Hathaway, 2007; Lucas, 2012; Walsh et al., 2013, Lucas & Walsh, 2017).

Despite the stated goal of the government regulations to provide reasonable access to medical cannabis, few studies have systematically investigated the access experience from a patient-centred perspective to ascertain whether reasonable access had been achieved. As discussed in Chapter 2, previous qualitative and quantitative
research that has explored the access experience of patients who use cannabis for medical purposes in Canada identified barriers to access under the MMAR. These barriers included difficulties obtaining the necessary medical documentation from a physician, problems with the supply options, and the high cost associated with access. The previous two chapters examined more closely the barriers and facilitators to legal authorization and the use of legal and illegal sources after the implementation of the MMPR.

This is the first qualitative study, to our knowledge, to directly explore the impact of the access experience on the lives of patients in Canada accessing cannabis both within and outside the legal framework from a patient-centred perspective after the introduction of the MMPR (Ryan & Sharts-Hopko, 2017). This chapter focuses specifically on the consequences of the access experience, including health, legal, financial, and social outcomes. In Levesque et al.’s patient-centred model of access to health care (the Levesque model), consequences are the final stage of access, and an important part of determining the access experience (see Figure 1.2). This inquiry will thus shed light on consequences of accessing cannabis for medical purposes, and how reasonable or, alternatively, unreasonable legal access to medical cannabis has been in Canada.

5.2 Methods

Interpretive description was the methodological orientation underlying this study (Thorne, Reimer Kirkham, & O’Flynn-Magee, 2004; Thorne Kirkman & MacDonald-Emes, 1997). This methodology is well suited to an exploration of patients’ experience of accessing medical cannabis and the perceived personal, social,
and system consequences. Interpretive description was originally developed as a research methodology for the applied health sciences with the intent to support the pragmatic exploration of complex patient experiences while also acknowledging the constructed and contextual nature of human experience. Additionally, this methodology is considered appropriate when investigators hold in depth knowledge of the phenomena of interest and openly bring that lens to the analysis and construction of knowledge. The principal investigator (RC) has extensive work and research experience in the field of medical cannabis, having undertaken research and advocacy projects with the goal of learning from patients’ experiences of accessing cannabis for medical purposes, and using this knowledge to influence policy and health services development. Other research team members have also been active in conducting studies focused on medical cannabis use in Canada, and are familiar with relevant contextual and policy issues. Further, interpretive description is a qualitative methodology that encourages the use of a conceptual framework to inform a study, as well as overtly drawing on previous research and experience related to the phenomenon to influence the methods. This methodology also allows for the construction of common themes within participants’ experiences of the consequences associated with access to cannabis for medical purposes in an attempt to offer an expanded understanding of how these experiences impact their lives, in order to offer implications for policy and practice.

The qualitative data for this study were generated through in-depth interviews with participants in the CANARY study, as described in Section 1.6. In brief, the study was a cross-sectional mixed methods study aimed at capturing the shift in medical cannabis regulations in Canada from the MMAR to the MMPR. The MMPR were
introduced in October 2013, and data for this study were collected 6 to 9 months post-introduction of the MMPR, reflecting the early stages of the new regulations and the transition period. Eligibility criteria included being at least 19 years of age, ability to speak and read English or French, and self-reporting a diagnosis of arthritis, cancer, chronic pain, HIV/AIDS or another medical condition for which cannabis was used. The survey data were collected from March to May 2014, and the qualitative interviews took place between May and July 2014.

Participants were sampled from the larger cohort recruited for the online survey (n=369). Individuals who had indicated a willingness to be contacted for qualitative interviews were contacted to engage in semi-structured, telephone interviews. Initially, a random number generator was used to select a random sample of 8 eligible participants within each of the following subgroups: 1) individuals authorized under the MMAR; 2) individuals authorized under the MMPR; 3) individuals not authorized under either set of regulations (referred to as No Health Canada Authorization (No HC)); and 4) individuals not currently using cannabis for medical purposes (referred to as Not Current). Due to no response, an expressed lack of interest, or unavailability, additional participants were identified in each subgroup using the random number generator until a sample of 26 individuals was obtained. Following data collection and initial analysis, purposive sampling was used to select an additional seven participants to ensure diversity in terms of age, gender, income, geographic locations, and medical conditions. Although the quantitative analysis was restricted to individuals who had used cannabis for medical purposes in the last 30 days, sampling for the qualitative portion of the study included individuals who did not currently use cannabis for medical purposes to gain their perspectives, and in
some cases, experiences with past cannabis use. A draw for $50 was conducted for those participants who completed a qualitative interview to enhance recruitment and acknowledge participants’ contribution of their time.

The interview guide was informed by the Levesque model and previous literature on patient experiences with access to cannabis (See Chapter 2), and was developed in consultation with knowledge users and research partners, as outlined in Section 1.6.1. The interview guide explored a range of factors related to the different stages of access outlined in the Levesque model, and encouraged the interviewers to use probes to further explore participants’ experiences. Probes were used to elicit more detailed data, and iterative questioning was used to verify accuracy and preliminary conceptualizations. Each interview was digitally recorded and interviewers took brief field notes following the interviews to summarize the key topics disclosed and any logistic problems identified during the interviews. Throughout the data collection process, the research team discussed the interview data as well as the focus and direction of subsequent interviews. The interview guide was revised in an iterative manner to explore new concepts that arose or to delve more deeply into identified concepts and themes as the data collection process progressed. In this way, data collection and analysis informed each other and allowed full saturation of concepts and themes in the data (Saunders et al., 2017).

All interviews were conducted by telephone and lasted approximately one hour (range between 12-80 minutes, median = 57). All participants provided informed consent and were interviewed by one of two interviewers. The author (RC) conducted all the English language interviews; a bilingual research assistant conducted interviews in French with two participants who identified French as their first
language. Both interviewers were experienced in qualitative research, previously involved in research on this topic, and had familiarity with this study population, which facilitated rapport between participants and interviewers, particularly given the potential illegal nature of some of the activities being discussed. The team had an awareness of and sensitivity to participants’ concerns about privacy and confidentiality. Data collection continued until data reached saturation in which additional participants’ narratives reiterated points made previously and no new themes or topics emerged. There were no follow-up interviews with study participants. All digitally-recorded interviews were transcribed verbatim, and French interviews were translated into English by the bi-lingual interviewer. All data were entered into NVivo (version 11.4.1), a software program designed to assist qualitative data management and analyses.

For the qualitative portion of this study, the analysis was restricted to data detailing the consequences of participants’ access experience related to medical cannabis. The analysis was informed by the Levesque model, which posits health care consequences as the final stage of a linear process of access, including health, satisfaction and economic outcomes. In recognition of the broader social and legal context of medical cannabis use in Canada (e.g., cannabis as a stigmatized and controlled substance), as well as previous research and the experience of the research team in the field of cannabis, data on the social and legal consequences of medical cannabis access were included in the analysis. The decision was made to exclude satisfaction as an outcome of interest in the qualitative analysis because of its previous coverage within the quantitative portion of the study, as well as its linkage to specific sources of cannabis versus overall access experience in the qualitative data.
Data analysis was conducted inductively, employing a multi-step interpretive analysis. Initially, RC reviewed all the interview transcripts and created a coding scheme that captured the broad outcomes of interest, namely the health, legal, financial and social consequence of participants’ access experience. The coding scheme was utilized to organize the data within the qualitative software program and facilitate deeper immersion and identification of key concepts and themes within each consequence. During the analysis process, key questions were asked of the data, such as “what is happening here?” and “what does this mean?”, to encourage reflection on the broader context of the data and the participants’ experiences of accessing medical cannabis. A final analysis was conducted by RC, who reflected on the diversity of participants’ experiences and contexts, and identified the commonalities across experiences, as well as exceptional and contrary cases, to support the construction of a rich description of the experiences depicted and a credible interpretation. Care was taken to stay close to the data and the meanings participants ascribed to their experience from their worldview, while gathering insights and identifying novel relationships between the access experience and consequences. The goal was to provide a deeper understanding of the phenomenon that would have practical applications to policy and programs to better support reasonable access to medical cannabis from a patient’s perspective.

In keeping with the imperative for rigor within an interpretive description methodology, the researchers conformed to the methodology by immersing in the data through the data collection process, and by carefully reviewing transcripts, and in some cases, listening to the recorded interviews. The analysis was supported by quotes, to substantiate and clarify the analytic logic. The depth of experience of the
researchers and familiarity with the phenomenon of interest, lent further credibility to the investigators’ interpretation of the data. At the same time, the researchers’ interpretive lens was made transparent through the acknowledgment of a guiding conceptual framework (i.e., the Levesque model) and contextualization of the findings within the social, political and legal climate. Techniques common to qualitative methodologies, such as audit trails of analytical decisions and validating preliminary findings with participants were employed. Validity was also demonstrated by developing findings that met what interpretive description methodology describes as the “thoughtful clinician test”; members of the research team with expert knowledge of medical cannabis access considered the results a plausible fit with the reality of patients accessing cannabis for medical purposes.

5.3 Results

In total, 33 participants were interviewed for this study, including 15 (45%) who identified as female, 17 as male and 1 as transgendered. The mean age was 50 years (range: 28 – 76 years, median = 47 years). At the time of interview, 11 participants were in the MMPR subgroup, 9 in the MMAR subgroup, 8 in the No HC subgroup, and 5 in the Not Current subgroup. It should be noted that some individuals changed regulatory subgroups between the time they completed the survey and the time they took part in the interview. Table 5.1 summarizes participants’ demographic characteristics.

Participants’ accounts included various consequences of accessing cannabis for medical purposes within and outside the regulatory framework. Their narratives
were grouped into four major thematic categories, including health consequences, legal consequences, financial consequences, and social consequences.

5.3.1 Health consequences

Most participants described experiencing challenges with access to cannabis including difficulties with affording adequate amounts, finding effective strains, having access to a variety of strains and products, and obtaining cannabis in a timely manner. These accounts further spoke to how the access experience, both within and outside the legal framework for medical cannabis, can lead to positive or negative health consequences. Three subthemes were identified under the theme of health consequences, including symptom management, treatment choices, and sense of autonomy.

5.3.1.1 symptom management

For many participants, challenges to accessing adequate amounts and effective strains of cannabis hampered their ability to effectively manage their health symptoms. For some participants, having access to less cannabis than they needed “wasn’t quite cutting it” for pain management, and they described experiencing “horrible pain” as a result. One participant with Crohn’s/Colitis described the impact of inadequate amounts of cannabis on their appetite:

*Some days I can’t afford it, and some days I can. Sometimes he’s [dealer] not available. I’ve gone almost up to five days without, and after five days…[I] have a hard time even wanting to get out of bed because I can’t eat. And that’s the biggest thing with me, is if I don’t consume [cannabis], I don’t eat, period. I have absolutely no appetite. So, if I’m not consuming, I’m not eating. So, after five days of no consumption of cannabis, I haven’t eaten anything either. (Participant #26, female, age 44, MMAR)*
Having access to a variety of strains and products also impacted symptom management. A few participants were able to access cannabis strains that addressed their specific symptoms by working with producers or self-producing under the MMAR. For example, one participant with arthritis, cancer and chronic pain, was able to provide their designated grower with seeds of a “pure indica strain” thought to help with sleep issues. Other participants spoke about the large variety of strains available at medical cannabis dispensaries (hereafter referred to as dispensaries), and being able to “get the ones that are useful for different things,” such as pain and nausea associated with chemotherapy. Some participants also discussed the pain relief they experienced with edible cannabis products and tinctures, which were only accessible through illegal sources, such as dispensaries:

*Just put about three or four drops under my tongue, and within about ten or fifteen minutes I could feel it, where it would take the pain away from my knee. But it didn’t get me buzzed out, where I couldn’t function.* (Participant #20, male, age 45, MMAR)

In contrast, some participants struggled to access effective strains from both legal and illegal sources, which negatively impacted their ability to manage their symptoms. For example, a few participants stated that the one strain available through Health Canada’s supplier under the MMAR was ineffective for pain management. Several participants accessing cannabis under the MMPR shared that although there was some choice of strains from LPs, they were not all effective. A participant with arthritis described being “in pain all the time” due to ineffective strains available from their LP, and described “try[ing] to hold out with the pain as much as they could” until they were able to switch to a new LP. Other participants spoke about the lack of choice of strains from illegal dealers, and the lack of consistent
effectiveness through this source. Several individuals shared their profound concerns about losing effective strains with the end of the MMAR. One participant described how this would impact their symptoms related to HIV/AIDS:

I’m going to have to go back to basically not sleeping, not eating properly, probably my lipid profile changing back towards a negative stance again, so those types of negative health effects are going to come back towards me, assuming that I can’t procure myself the right medicine. Which I’m not going to be able to because I’m running out. (Participant #25, male, age 30, MMAR)

Not only were some strains ineffective, but some had unwanted side effects that were identified as problematic. For example, several participants noted that some strains were too strong, leading to “overwhelming intoxication,” which made managing symptoms even more difficult.

The inability to effectively manage symptoms due to access issues increased stress and anxiety levels for some participants. For example, several participants noted that LPs were selling out of cannabis strains as soon as they became available online. This lack of availability of cannabis from LPs was extremely stressful for several participants, and led one participant with chronic pain and PTSD to visit the hospital for “shots” to calm down so they could sleep at night. Conversely, those participants who were able to find a reliable supply of cannabis experienced a sense of relief knowing they would be able to manage their symptoms effectively.
5.3.1.2 treatment choices

Access to cannabis impacted participants’ treatment choices in terms of the amounts and forms of cannabis they used and their use of other medications. Limited access to cannabis due to poor availability from suppliers, as well as lack of affordability, impacted the amount of cannabis many participants could access. As a result, some participants “eke[d] out” or “ration[ed]” their supply of cannabis, using less than was needed to fully benefit, but making it last longer. Anticipating the end of the MMAR and legal personal production, a participant recounted being “frugal” with the cannabis they had grown, for fear of not being able to access any in the future. Conversely, several participants increased their dosage to get the desired effect when they could not find effective strains, despite concerns that this elevated level of use might lead to negative effects on mental health and respiratory functioning.

Some participants chose to use cannabis products, such as edibles and tinctures, which were only available through illegal sources. These products were perceived by some to be more effective than other products. Others preferred these products because they could be used to avoid the smell that came from smoking, and thus could be used more discretely. For a participant with a spinal cord injury, these forms also allowed more independent use:

And for me, with limited hand function and various things, I need somebody—if I was forced into a position where I’d have to smoke it, I’d have to have somebody facilitate that for me as well. Whereas the tincture and the edibles, I can do totally independently. (Participant #31, male, age 58, No HC)

Access to cannabis also impacted treatment choices made by participants in terms of their use of other prescribed and over-the-counter medications. For many
participants, cannabis was used as a substitute for other medications, including those used for pain, anxiety and sleep. For some participants, opioids or other medications were not a viable option because of the associated side effects. Having access to effective cannabis strains and products helped some participants reduce the dosages of other medications. A participant with arthritis and cancer described taking “two of the prescription instead of the brownie,” because edible cannabis products were not approved under the MMPR. Other participants, including a participant with chronic pain and PTSD, also described taking opioids only when cannabis was not available:

I take, say, three codeine pills, say if I took one this morning, one in the afternoon and one at night, I can feel my liver by night time. I can feel the pain in my liver and my liver swells, and then I get black eyes. So even when I do have to bring myself to take a pill, and that usually only happens when I don’t have a good supply, because if I don’t have the weed to take and I can’t get out of bed, I got to take something.

(Participant #23, female, age 46, MMAR/MMPR)

The ability to produce their own medical cannabis under the MMAR allowed some participants to have an adequate supply of effective strains, or products, and thus avoid using medications they believed were less effective, or that they considered to be dangerous. Some participants described being willing to risk their liberty to preserve their treatment option when this supply source ceased to be legally available after the MMAR ended:

If we lose our growing rights, I’m screwed. I mean, I can tell you in all honesty that I will not go without this medicine ever again. Ever. I don’t care if it’s legal, illegal, what I have to do, I will not go back to taking that poison that was killing me. That is all there is. That’s the bottom line. They want to put me in jail, they’ll have to do it because I will not—will not knowingly kill myself. Period. (Participant #9, female, age 52, MMAR)

5.3.1.3 autonomy: I’m an expert in me
The use of medical cannabis and how the access experience impacted participants’ sense of autonomy and control over their health and health care was a common narrative. A sense of autonomy was a valued health outcome for many participants. Several participants contrasted the lack of control they felt in the conventional medical system with the sense of control the use of cannabis gave them over their treatment decisions:

_In my experience, it’s very important for people to feel like they do have a voice in their own care and that they have a say and that it’s not just driven by the doctors and it’s not just prescriptions and the doctor dictating what’s going to happen. They want to be actively involved and driving the ship for the most part, as much as possible._ (Participant #12, female, age 35, Not Current)

Several participants specifically contrasted their use of pharmaceutical drugs with their use of cannabis, the latter reportedly providing them with more autonomy to make choices that were responsive to their own needs with respect to strain, product and dosage:

_Well, then I have variety…If this ain’t working, at least I know I have options. The other way, you know, doesn’t matter if it’s working or not. They just keep re-prescribing it to you. And years later, they’ll say, ‘Oh, well, obviously, that didn’t work. Well, let’s try you on this.’ I’m getting old. I don’t have years and years of being misdiagnosed, knowing stuff’s going to work or not. Where [with cannabis], that didn’t work, so I can try this. Well, that didn’t work. Let’s try this._ (Participant #20, male, age 45, MMAR)

For one participant, legal access was an important step in taking control of their life:

_I had a counsellor who told me I need to take control of my life, and—because I was having so many problems, doing everything that the doctors said, and then just adding more pills all the time. So, I thought, ‘Okay, I’m going to take control’. Becoming a legal medical marijuana patient was to me one of the first steps, taking_
control of my health, being able to reduce some of my medicines, and hoping to reduce more. (Participant #19, female, age 56, MMPR)

However, the impasse many participants experienced with their physicians regarding gaining access to the legal cannabis program thwarted their desire for autonomy. While valuing professional input and expertise, many participants felt they had more knowledge about cannabis than their physicians, which they had acquired from their own research and personal experience with cannabis:

I trust my own research more than I trust other people’s, to some degree. I like to do my own research and then find out. I don’t think I know more than my doctor, but I think I have different experience than my doctor. He’s an expert in headaches. I’m an expert in me. (Participant #21, female, age 34, No HC/MMPR).

Participants described how producing their own cannabis was a way to be completely engaged in their own health. Many participants described it as “empowering” to be able produce the medication that played a role in their healing. For a participant with cancer, the value of having a sense of control over their own health by growing cannabis was “immeasurable,” especially after receiving the diagnosis of a life-threatening medical condition. Participants described the high level of involvement, emotional investment, excitement and interest they took in the growing process, and the meaning they derived from nurturing their plants. For many participants, the level of control they experienced with personal production of cannabis, and the act of growing the plants, was as much “part of the healing process”, as the actual effects of the plant itself on their symptoms:

I think that me being able to make a decision about the strains or what effects I want or how much I grow or when I harvest it for different types of effects, to me that would be just incredible because some random person in a factory growing weed under a whole bunch of factory lights versus something that I’ve created, that I’ve grown, there’s a lot to be said about the placebo effect and the psychosomatic effect of
medicine that you yourself have in some way handled. It’s like food you’ve cooked or food you’ve grown in your garden. It just tastes better. So, for me, that’s an important part of healing. It’s not just chemicals. It’s not just therapy. It’s a whole spectrum of stuff, and medical marijuana is just a part of that. (Participant #28, transgender, age 34, No HC/MMPR)

Producing cannabis was also identified as a way for participants to have control over their medicine. As articulated by a participant, growing cannabis provided the ability to “know every single aspect of what I’m doing and how the medicine’s entering my body.” By controlling the nutrients and pesticides used, as well as the growing and production process, participants could control the quality of their cannabis. By controlling the genetics through seeds and breeding, other participants spoke about being able to “design” their own medicine.

In contrast with the empowering feelings participants derived from producing cannabis, several participants who had switched from the MMAR to the MMPR described a sense of loss as a result of no longer being able to legally produce cannabis for themselves. Others who were still producing cannabis under the MMAR expressed concern over the impending loss of this supply option, and were not keen to give it up:

Right now, I have tons of choice because I can just go pick any types of seeds that I want and grow it myself and then I can make my own. I can cross two different strains together that’ll help me stay awake during the day instead of being on the couch and going to bed. And then I’ll have a different one for at night time, so I pretty much made my own strains for myself that work for me. And nobody else has those, so it’s going to be—well, I’ll lose those if I had to give it all up per se. But I don’t think I ever would. (Participant #14, male, 35, MMAR)

The sense of autonomy derived from growing cannabis was important to many participants on a personal level; however, one participant noted that personal production of cannabis was also important for control over health at the societal level:
I think it’s very undemocratic. I think people should be able to take control of their own health, that we don’t need to be going down the street to go and get a plant that people could take care of themselves or a friend could help them take care of.

(Participant #30, female, age 66, No HC)

5.3.2 Legal consequences

In using cannabis for medical purposes, participants found themselves forced to balance their constitutional rights to health and to liberty; many struggled to meet their health care needs while remaining within the legal framework. Participants described engaging with the legal system to the extent that it allowed them to meet their health care needs, and accessing cannabis outside the framework when they felt it was necessary to address cost, quality, and availability issues associated with legal cannabis. Wherever they stood on the legal continuum of medical cannabis access, participants described having to contend with potential legal consequences. Three subthemes emerged under legal consequences, including encounters with the criminal justice system, finding a moral comfort zone, and grey areas of the law.

5.3.2.1 encounters with the criminal justice system

Participants were keenly aware of the legal repercussions for illegal cannabis access, and were concerned about possible encounters with law enforcement officers and the criminal justice system. Participants feared potential consequences of such encounters, which included getting arrested or going to jail. For others, fears extended to “losing everything that I had”, or having the police “show up and take my kids away.” Having a previous criminal record left some participants apprehensive that an additional encounter with the criminal justice system related to their medical use of cannabis could lead to a serious criminal conviction. Some participants reported
that they themselves, their doctors, or their cannabis suppliers had been arrested or received criminal records in connection to illegal cannabis possession, production or distribution. One participant recounted what transpired when her husband bought cannabis for her medical use from an illegal source:

*I’m interested in cannabis and the political aspects and the terrible things that have happened to people just because they used cannabis and the police have caused so much problems in their lives and with their families. And that’s happened in my life too, using cannabis. My husband was busted and so he had a criminal record even though it was for less than an ounce, just bringing it home to me, so I felt terribly guilty. I just felt awful, awful, awful about that happening.* (Participant #30, female, age 66, No HC)

The prospect of such repercussions for breaking the law for their use of medical cannabis prompted many participants to seek registration in a legal program. For many participants, registration in the legal program allayed their fears of legal repercussions. In particular, some participants noted that the documentation obtained through the legal program could be used to verify their legal use during encounters with law enforcement officers. In this regard, being able to access cannabis legally was described as “incredibly liberating,” and many participants spoke about the “extreme peace of mind” that legal access gave them. A participant described feeling “like the weight of the world lifted off my shoulders” after their doctor sent the paperwork to Health Canada. For some participants, this reduction in stress had beneficial effects on their health:

*When I found out that I could do it myself and—though cumbersome but eventually accessible—I got access to it, then I was relieved that I was no longer in fright of being arrested for something that was helping me. I mean, that has a big help on your mental and physical health. I mean, the mental part, relieved, and then your physical health that follows because it’s just how it works. The fact that you don’t need to be scared to walk around and have a joint on you.* (Participant #25, male, age 30, MMAR)
However, there were participants who had registered in the legal program to avoid taking part in illegal activities who nonetheless found themselves accessing cannabis from illegal sources to meet their health needs. Some participants were distressed by this situation:

*I got to go and get it, and hope I don’t get arrested in the process. Hope no one raids their house while I’m over there getting some, and hope that I don’t get arrested for holding onto a product that didn’t come from the companies in which I purchase from. So, there’s major anxiety because of all of that. Stress, anxiety. I’m not happy about it, I’ll tell you that much. There are a lot of problems that could happen from me getting it from somebody else.* (Participant #4, male, age 33, MMPR)

Furthermore, other participants described being threatened by the government with legal repercussions despite their best efforts to be law-abiding. This was the case for some participants caught in the transition from the MMAR to the MMPR:

*I mean, even when Health Canada said, ‘Okay, the new program’s ending so we need you to send in your licenses. We need you to go and throw out all your pot with some cat litter, otherwise we’re going to send the RCMP on your ass,’ that there is like, whoa. I went and got legal because I didn’t want this thing to happen, and now you guys, who I went and got legal with, are telling me you’re going to send the law? It’s ridiculous.* (Participant #5, female, age 31, MMAR)

Paradoxically, although legal access to medical cannabis was associated with absence of legal repercussions for many participants, a few individuals believed registering for legal access could pose a greater threat to their liberty. Specific concerns were breaches of confidentiality, or the notion that having their name on a list could make them a “very easy target” should there be future changes to the regulations. In the opinion of one participant, whose doctor was being investigated for conduct related to authorizing cannabis, legal access was “way more dangerous than going to the street and getting it from my friend.” This perspective highlighted the lack of trust some participants felt toward law enforcement, as well as the government:
The fact that that’s the Government of Canada. Seriously, I don’t think they need to know—this government particularly is so anti-science. I’m quite concerned that if I become a Government of Canada legal user, then I start getting watched for all kinds of things, which is just because I’m trying to use medical marijuana, because this government’s so stupid about that stuff. And I’d rather remain under the radar for as long as I live, than have the government constantly monitor every move that I make. (Participant #2, female, age 50, MMAR/No HC)

Other participants were concerned that being known as a medical cannabis user would lead to scrutiny from the police. A participant living in a small rural town recounted their experience with the police after registering in the MMAR:

Just because of the fact that being a medical patient, you get pulled over. The RCMP, the first thing you do, especially in a small town, they all know that I’m here, right?...And you know, for them to be able to phone up Health Canada and say, ‘Hey, this person,’ whether it’s RCMP or not, then the RCMP have you, right? Now we get pulled over and the first thing they ask for is our licensing, ‘Do you still have your medical license?’ (Participant #26, female, age 44, MMAR)

5.3.2.2 finding a moral comfort zone

The barriers to accessing cannabis within the legal framework also compromised participants’ ability to act in accordance with their morals regarding abiding by the law. Many participants expressed a preference to act within the law to access cannabis for medical purposes, as they did in other areas of their life:

You’d rather be legal, you know I drive the speed limit, I try to obey the laws in all aspects of my life so if there’s a chance to do this legally then why not right? (Participant #1, male, age 60, MMPR)

For some participants, complying with the federal regulations for medical cannabis access addressed their moral imperative to be law abiding and the prospect of acting outside the law to meet their health care needs was morally distressing. For example,
some participants who had been producing cannabis legally under the MMAR were concerned that they would no longer be able to afford to legally access cannabis under the MMPR. For one participant, this prospect challenged their self-concept as being law-abiding:

Well, it means that either a guy who’s spent his whole life being a law and order guy breaks the law and grows his own, or he comes up on assistance with five thousand dollars a month. So, it kind of leaves me in a really crappy place. (Respondent #7, male, age 47, MMAR)

Accessing cannabis within the legal framework did not necessarily allay all participants’ moral concerns. Several participants expressed discomfort with some practices that were occurring under the legal system. For example, some questioned the practice of over-production by those licensed to produce under the MMAR; they perceived this behaviour to be associated with “bottom dwelling criminals” and organized crime, with which they preferred not to engage. Others believed the misuse of the MMAR was not necessarily perpetrated by criminals, but that it nonetheless was morally reprehensible. For example, one participant believed such actions tarnished the viability of the program and impeded the rights of others to access cannabis for medical purposes:

Then they told me that all of them were medical users and that they were selling the extra. I think that’s what got us all into trouble because they’re selling their extra weed and now people like me can’t get the right to grow it. (Participant #23, female, age 46, MMAR/MMPR)

Interacting with illegal sources posed a moral quandary for some participants. One individual described feeling like a ‘shady criminal’ when they first accessed from illegal sources, but became more comfortable, over time. In contrast, another participant perceived the illegal sources from which they accessed cannabis were
legitimate, despite being illegal:

I don’t mind supporting anybody for any kind of commerce that I think is legit. I mean, marijuana, we all know the legality of it, but I mean, it’s a plant. It’s like tomatoes. I feel no, you know, remorse. I don’t think I’m supporting negative crime or anything. I know who the suppliers are, I know who they’re involved with, you know. So, in my mind, I was fine getting it the way I was. But then I’d know either party could get in trouble including myself for doing an illegal action, right? (Respondent #25, male, age 30, MMAR)

5.3.2.3 grey areas of the law

The changes in regulations and the legal status of some sources of cannabis led to several participants being uncertain about where they stood legally during the transition between the MMAR and MMPR. The complex stipulations of the court injunction that kept both medical cannabis regulations in place simultaneously contributed to this uncertainty. A participant explained the challenges they faced in complying with the law under such circumstances:

So technically, I guess I’m breaking the law currently. But because of the court case going on and the government, no one really knows what’s going on or what happens. Like, if I run out [of cannabis], what do I do? Do I get a supplier? Is it possible at this point? No one knows. (Respondent #25, male, age 39, MMAR)

Another participant recounted the predicament they were in due to the government not allowing them to change the address associated with their personal production license during the transition period:

I can’t grow because I can’t change my address, so I’m stuck buying from a dispensary, but once it’s in my hands, my ATP [Authorization to Produce] has me covered. So even with my license from Health Canada, I’m still operating in big grey areas. I find that very stressful. I’m a parent, I live in a small apartment, I’m a federal worker. There’s lots of things that make me feel like even with my license, that I’m still doing something wrong. Or not wrong, but something shady. And that’s really difficult. (Respondent #5, female age 31, MMAR)
Although many participants sought to access cannabis through legal sources, the confusion around the legal status of some sources, particularly dispensaries, impeded their ability to make informed decisions. For example, some participants believed that dispensaries were legal, or “quasi-legal”, and other participants were less clear:

I guess it’s a grey area still, isn’t it? I’m not really clear about that. Is it legal on the books, or is it just, you know, kind of—it’s still in limbo to some extent? I don’t know. I assume that I’m safer—maybe I am making assumptions and I need to know more about that. No, but normally what I’ve heard is, well, it’s not officially legal, but they give an allowance based on the fact that they have medical support for it. And you can’t just go in there without being a member and just buy it for recreational purposes. You have to have a particular purpose for buying it that’s supported by your doctor. If I turned around and give some to other people or sell it to other people, that’s a problem because that would not be considered legal, I guess. (Respondent #31, male, age 58, No HC)

While some participants were comfortable accessing from dispensaries despite this perceived ambiguous legal status, others felt uncomfortable with the concept of a “legal grey zone” and questioned the character of the people and practices they employed:

I thought about it, but the cusp [sic] with them is that they’re not legal. They’re working in that grey area. But when it comes to the law, there is no grey area, and you’re—a lot of this, you’re doing this online, you’re faxing them information. I wouldn’t really refer to some of these compassionate clubs as upstanding citizens. And I don’t really want them having my medical information, let alone my address, you know? Don’t get me wrong. There are some Compassionate Clubs out there that are truly legit and very great people, but you don’t know who you’re dealing with. So that’s freaky. (Respondent #15, male, age 31, MMPR)

5.3.3 Financial consequences

The affordability of cannabis and its impact on access had substantial health and legal consequences for study participants, as discussed above. The affordability
of cannabis also had financial consequences for participants accessing cannabis under different regulatory frameworks and from different sources. Two sub-themes were identified under the theme of financial consequences, including financial stress and prioritizing life necessities.

### 5.3.3.1 Financial Stress

In speaking with participants about accessing the medical cannabis program and sources, a common narrative that emerged was the financial cost. Many spoke about low cost of producing their own personal supply of cannabis under the MMAR, especially compared to the price of cannabis acquired from LPs under the MMPR. Access to cannabis from LPs was also considered to be costlier than from illegal sources, such as dispensaries and street sources, especially when taxes and shipping prices charged by LPs were factored into the cost. Regarding affordability, when asked about the ideal price for cannabis that would allow them to access the quantities they needed, responses ranged from $1.60 - $8.00 per gram, including shipping. These prices were well below those typically charged by most sources.

The high cost of cannabis resulted in financial stress for many participants, and varied depending on income level and the source of cannabis accessed. Many participants were living on a low or fixed income, including disability, employment insurance, and senior’s pension. Others were contending with financial instability resulting from seasonal work. For these participants, “any medical expense is a pinch”, and the high cost of cannabis created substantial financial stress. As one participant articulated: “I’m on disability, so it’s stressful when you start factoring in, do I have enough money to feel good this month?” (Participant #15, male, age 31,
MMPR). Some participants who had higher incomes considered themselves fortunate to be able to afford cannabis and expressed concern about how those with lower incomes could access cannabis, recognizing that cannabis was “the same price for everybody” and that for some individuals, even “twenty bucks a month could actually be a consideration.” Some felt compassion for individuals who were “more destitute” or less privileged:

*I’m sure everybody has the same problems, right now I get worker’s compensation, so I’m a little better off than other people who are say on disability benefits from the government. I worked as a tradesman, so I was able to save and I never carried any debt so that’s my situation. Somebody who’s on disability from Canada pension or whatever, I don’t think it’s too much, so they would have a more difficult time than myself.* (Participant #1, male, age 60, MMPR)

Some participants spoke about the financial burden caused by the minimum purchase requirement enacted by many LPs, which became even more problematic considering that LPs would not provide a refund if the product was ineffective. Some participants also noted that the financial stress was heightened for individuals accessing cannabis under the MMPR due to the high price of cannabis from this source. Predominantly affecting those with low incomes, the higher cost of cannabis from LPs was also perceived as a “stretch” for some of the participants who were employed and had higher incomes. One participant figured that if they were to purchase cannabis from an LP, their “prescription” would cost as much money as they earned all year. The transition from the MMAR to the MMPR also resulted in financial stress for some participants who had invested in their personal production of cannabis. The change of regulations, and the loss of their investment, was unexpected and distressing for some participants:

*I’ve spent ten thousand dollars on building my room in my house to make sure it was...*
all vented properly, and everything, and now to lose it all, it’s a huge shock and it’s a lot of money. (Participant #14, male, age 35, MMAR)

5.3.3.2 prioritizing life necessities

The high cost of cannabis meant that the expenditures for cannabis comprised a substantial part of participants’ monthly budgets. For those on fixed or limited incomes, there was often little money remaining for cannabis after paying rent, taking care of dependents, and covering additional household expenses:

I’m on a disability pension. I don’t have very much money, right? So, at the end of the month, after paying all my bills, I have a 14-year old daughter I have to take care of. So, everything I have, I buy her new clothes, I buy her what she needs, I take care of my dog, I take care of her. I take care - I barely take care of myself. And on top of that, I got to pay outrageous prices for a medication (Participant #4, male, age 33, MMPR)

As a result, participants spoke about the measures they took to be able to afford cannabis, which they considered a medical necessity. A participant with chronic pain and anxiety articulated the importance of cannabis as a medicine: “It’s like food. It’s something you have to have”. For those with extremely limited incomes, the cost of cannabis meant choosing between food and medicine. Several participants spoke about spending money on cannabis that would otherwise be spent on food: “It’s not affordable, but I afford it anyway because I can’t stand the pain, right? So, basically, I use half my food money on cannabis” (Participant #11, female, age 60, No HC). For other participants, it meant rationing their use of cannabis, and juggling other necessities. One participant noted how this was exacerbated by the LP’s practice of requiring that individuals pay for cannabis in advance of receiving the product:

You ration. I do what I can for the month. So, when I’m sending my money for a month’s supply of weed and I don’t get it, now I got to go into my grocery money, I got to go into my gas money to keep me going until my weed comes in. It’s not fair.
Some participants changed their lifestyle or borrowed from their future security to address their health needs with cannabis in the present. One participant described the financial risk they were taking to utilize cannabis as part of their health care:

I downsized my life from a three-story house for my medical bills, because I do a lot of alternative [therapies] to be this functional, including cannabis, I’m spending my retirement on cannabis. Because I’m hoping to get well enough that I could still work a few years… So, if that plan doesn’t work, I’m up the creek. (Participant #24, female, age 58, MMPR)

Another participant astutely noted that the high cost of cannabis and the resulting need to prioritize life necessities could also have financial repercussions on a societal level:

The social determinants of health, one of them is poverty, and if they had to fork out so much money per week to order their [cannabis] supply and have it mailed to them, it will still have an effect on their health because they don’t have the extra income for food and other necessities of life, like shelter. So, in the long run, it’s going to be more expensive on the healthcare system because of the costs associated with the new program (Participant #27, male, age 47, Not Current)

5.3.4 Social Consequences

“…prejudice and stigma is going to be the biggest obstacle as far as widespread acceptance is concerned.” (Participant #22, male, age 28, MMAR)

In using cannabis for medical purposes, participants contended with the social consequences of stigma associated with cannabis. Their narratives speak to how this stigma can impact the lives of people using cannabis for medical purposes, and how this may be impacted by the regulations for legal access. Three subthemes were
identified under social consequences, including stigma experiences, responses to stigma, and the impact of legal access.

5.3.4.1 “just an excuse to get high”: stigma experiences

Participants’ narratives frequently addressed the types of stigma they experienced, and how they felt others in society viewed them. In particular, participants identified the association of cannabis with other controlled substances, the conflation of medical and recreational cannabis use, and the lack of understanding about cannabis’ therapeutic applications as some of the foundations of the stigma they experienced from others, and that some internalized themselves.

All participants were cognizant of the stigma associated with cannabis use. This included the more general types of stigma, for example, as noted by one participant, that it “makes you a lazy slob.” Participants were also aware that cannabis was associated with other controlled substances and was considered by some to be a “gateway drug.” One of the most pervasive stigmas discussed by participants was the perception that those using cannabis were “drug addicts.” Some felt that cannabis was equated with illegal recreational hard drugs, such as heroin, and one participant suggested that cannabis was judged negatively because it had pleasurable side effects, including getting high.

Additionally, due to the widespread recreational use of cannabis in Canada, and lack of understanding of the legitimate therapeutic use, many participants felt that others perceived medical use of cannabis as “just an excuse to get high.” Although many participants felt their use of cannabis was generally supported by those close to them, some felt there were people in their lives that “looked down on
it” and questioned whether individuals using the program were “real patients” or were abusing the healthcare system to legally access cannabis for recreational use. One participant felt that others believed that “people have a license just to smoke weed, that there’s not relief from pain, there’s no benefits from marijuana use” (Respondent #13 female, age 44, No HC). As a result, participants perceived their use of cannabis was met with skepticism and incredulity. A participant described an experience illustrating the assumptions and stigma they perceived to exist regarding medical cannabis use versus prescription medication:

*If I use cannabis anywhere, people look at me like I’m a criminal or a whatever. They have no idea that I’m a medical patient or that I have a license. They just presume I’m some pothead smoking pot outside the restaurant or something… they don’t look at people who are taking a prescription drug like that, so I don’t know why they look at other people like that.* (Participant #14, male, 35, MMAR)

Several participants spoke about the internalized stigma they personally held about cannabis use. One participant shared their struggle accepting their own use of cannabis for medical purposes: “I knew it was helping me, but I’d never wanted to be that girl” (Participant #23, female, age 46, MMAR/MMPR). Peer-reviewed research and documentaries helped some participants overcome their internalized stigma about cannabis and to “forgive” themselves for using it. Conversely, for other participants the internalized stigma about cannabis use persisted, despite their being part of the legal system. A participant living with arthritis and attention deficit hyperactivity disorder (ADHD) noted that:

*There’s just this weird feeling to go to your doctor and be, like, ‘Hey, can you prescribe me an illegal drug that no one else can have?’ It’s unsettling. Even though I knew what I was doing wasn’t wrong, you still feel like you’re doing something wrong.* (Participant #15, male, age 31, MMPR)
Interestingly, although they used cannabis therapeutically themselves, some participants questioned the legitimacy of others’ use. One participant described being skeptical of the other people they had encountered waiting to see a doctor who provided documentation for the MMPR: “I just felt they were totally recreational users. Like, in California, it’s gone rampant where you have a pimple and it’s enough for a license” (Participant #24, female, age 58, MMPR).

5.3.4.2 keeping it secret: responses to stigma

The stigma associated with cannabis was experienced in different areas of participants’ lives, including their workplace, homes, communities, and social life. A recurrent narrative in this study was the use of discretion and secrecy to avoid consequences of stigma in these realms. Discretion was especially a concern at work, where many felt there was a bias against cannabis use due to its illegality, as well as misconceptions about the effects of cannabis, including a belief that those using it were “high all the time.” Several participants expressed concern that if their co-workers knew they were using cannabis, they would judge any mistake they made as being related to their cannabis use and, as a result, they would “lose all credibility.” For example, one participant shared: “If I was to forget to do something and they knew that I was using cannabis, right away it would be, ‘Well, what’s going on here, [name redacted]? Too much of the wacky tobaccy?’” (Participant #6, male, age 57, MMAR). For others, the consequences of this stigma in the workplace could be more severe, with some fearing it would “destroy their career” if anyone were to find out about their medical cannabis use. One participant said they were waiting until retirement before they could “come out of the closet” about their medical cannabis use. In addition, the fear of work-related repercussions appeared to be elevated in
certain fields of work. For example, two participants who worked in jobs related to drug addiction felt that their medical use of cannabis would not be tolerated. This fear not only lead them to remain silent about their use, but also resulted in trepidation about registering in a legal program or even going to a dispensary, lest anyone find out:

The fear of stigma and loss of job. Those are real in the line of work that I do. I teach addictions at a community college and I work with women addicted to drugs. I’m their addictions counsellor, for Christ’s sake, for opioids. Those things keep me from fighting too hard for a prescription. (Participant #13, female, age 44, No HC)

The stigma surrounding cannabis use was also connected with its smell, and the need for discretion around the smell of cannabis was commonly referred to in participants’ narratives. Many participants shared that they felt the need to be discreet about their use of cannabis in their homes and public spaces, which impacted their cannabis use, including what products they used and where they used them. For some, this meant taking care to hide the smell associated with both smoked and raw cannabis when using or transporting cannabis. Edible products were used by some participants to avoid issues with smell; however, these products were not legally available. The smell of cannabis also made it difficult for some participants to find a suitable place to use it. For example, some participants who lived in rental accommodations reported being forbidden by landlords to use cannabis in their homes; they also experienced problems smoking it outside their home or in parks, because others around them were offended by the smell. There was also concern, especially in small towns, about receiving packages in the mail from LPs that might smell of cannabis, or otherwise identify them as cannabis users.
The stigma experienced, and their responses to it, led to further social consequences for some participants. Many participants expressed feeling cautious about disclosing their cannabis use to friends or acquaintances for fear of being shamed by people who might be “judgmental”; several participants reported they only shared information about their cannabis use with people that were very close to them or that they knew also used cannabis. This perceived imperative to be “secretive” about their cannabis use led several participants to feel limited in who they could associate with and to avoid social situations where they might feel compelled to be dishonest with others or feel “like an outcast because you can’t talk about yourself.” For some participants the level of discretion they felt was necessary to hide their use of cannabis led to a sense of isolation, whereas for others, the “us and them mentality” created new social communities formed around accessing and using cannabis. For example, one participant characterized the relationship they had established with their designated grower under the MMAR as being “like family, like friends,” and described having social visits, sharing information and brainstorming about medical cannabis use with this individual. Several participants also spoke about the sense of community, validation, lack of judgment and friendliness they encountered at medical cannabis dispensaries and vapor lounges, where they met “other people that you can talk to, have similar symptoms, so you can compare what you’re experiencing” (Participant #30, female, age 66, No HC). One participant likened their experience at a dispensary in Vancouver to “going into somebody’s living room” in contrast to the “cold sterile” environment of a medical clinic. Another participant from Ontario contrasted accessing cannabis at a dispensary to accessing alcohol at a provincially-run liquor store:
If I was going to compare it to, say, the way the LCBO [Liquor Control Board of Ontario] is doing things now, maybe that might be more convenient, but there was a certain social aspect to this that is undeniable. It was actually quite nice. Friends would get together and it created its own little social circle. (Participant #7, male, age 47, MMAR)

5.3.4.3 “the government said it’s ok”: the impact of legal access

Participants’ narratives revealed differing perspectives about whether the regulations for medical cannabis access were helping to combat the stigma around medical cannabis use and the resulting social repercussions. Some participants experienced positive changes stemming from the regulations and were optimistic about further improvements. In a practical sense, the regulations provided concrete proof of their medical use of cannabis, in the form of documentation from healthcare practitioners, and well as having their medicine in “a bottle with your name on it.” Participants felt such proof legitimized their use of cannabis and distanced it from recreational use, increasing receptiveness and stimulating discussion with those around them:

Since I got my license...everybody that ever looked at me cross-eyed or looked at me because they smelled weed on me, because I smoke a joint because I was in pain — to be able to show them that bottle with my name on it and for them to know that I wasn’t just a pothead. Like, I really am sick. That in itself has made my life and my sense of me much better. Because as soon as they see your name on the bottle, then it’s cool... as soon as they seen that they’re all, ‘Oh, my god. Wish it was me. My god, we should be using.’ (Participant #23, female, age 46, MMAR/MMPR)

In addition, some participants felt that the government’s involvement in the regulation of medical cannabis conferred credibility, and the existence of the government program in and of itself was proof that medical use of cannabis was legitimate. Several participants felt the strictness of the regulations, and fact that the
government was supplying cannabis (through its contracted supplier and licensed producers), provided the message that “the government said it’s ok”, and led to more positive perceptions about medical cannabis users:

I feel like people who are more conservative or traditional or, more prescribed to the medical model will see this as, it’s more regulated, it’s more controlled, it’s safer, it’s tighter or more stringent rules and it’s being managed by the government so it must be better. That kind of mentality. Must be safer. (Participant #12, female, age 35, Not Current)

Additionally, some participants perceived that the regulations and related sources of cannabis brought more attention to the medical use of cannabis, opening up dialogue about it across the country. For example, some participants pointed to the increased number of stories in the mainstream press about the medical cannabis program. Others noted that the requirement for medical documentation to access cannabis through the legal program resulted in increased dialogue between healthcare practitioners and LPs, individual patients, and clinics set up to support patients in gaining documentation. Several participants suggested that those using cannabis for medical purposes were playing a role in addressing the stigma by speaking about it openly. A participant who was active in the “HIV scene” lauded those who were “willing to flaunt it”, framing this attitude as a way to increase the acceptability of medical cannabis. This kind of engagement and advocacy was thought by some participants to be facilitated by the legal program, and to be instrumental in reducing stigma:

To me, going out and being able to say, ‘I smoke medical marijuana. I’m a great mom. I do all these things in society. I’m not a bad person. Other people need it way more than me. Let’s have a conversation... I need to speak up even louder because I have that luxury where a lot of people don’t because they only have an illegal supply (Participant #28, transgendered, age 34, No HC/MMPR)
Another aspect of the mainstreaming of medical cannabis pointed to by some participants was related to the financial aspect of corporate LPs. For example, some participants believed that the viable business and investment opportunities with medical cannabis companies added another level credibility; this sentiment was expressed by a participant as “Let’s face it, when there’s money involved, people think differently” (Respondent #26, female age 44, MMAR). The LPs also brought more people into contact with medical cannabis by providing employment, which some felt generated more acceptance in the communities where LPs were located: “The church and everything was totally against it all happening, and now they’re all supportive, because it’s bringing income to the community and they’re happy about that” (Participant #4, male, age 33, MMPR).

In contrast, other participants believed that the stigma related to medical cannabis use persisted despite the federal regulations for medical cannabis access. According to one participant: “The medical establishment has demonized pot so much that it just looks like you’re a drug addict, regardless of what the regulations are.” (Participant #2, female, age 50, MMAR/No HC). Some participants suggested that although the government created a program for legal access, they did not express support for their own program, and that there was messaging from Health Canada stating that they “don’t back” the program and “never thought it was medical.” Moreover, other participants suggested that Health Canada’s regulations stigmatized patients, particularly those individuals engaged in personal production. A participant shared the belief that Health Canada was demonizing personal production as dangerous and hazardous to health, which they felt was unfounded. Another
participant felt by removing the right to produce cannabis under the MMPR, Health Canada was sending mixed messages that contributed to the stigma:

*Health Canada goes first, ‘Yes, you can,’ and then ‘No, you can’t because we can’t trust you not to be drug dealers.’ You know, I wonder how many cancer patients they had to say that to.* (Participant #15, male, age 31, MMPR)

Some participants believed that Health Canada had good intentions, which were negated by gaps in implementation of the program. Specifically, some participants believed that public education had been insufficient. Given the entrenched stigma associated with cannabis use, some participants felt that an attitudinal shift “could still take years to come to fruition” and only through full legalization of cannabis for recreational purposes would the stigma be resolved: “I think honestly it would take pot being legalized, in general, in Canada to lose the stigma, and even then, I think it would take years” (Participant #15, male, age 31, MMPR).

### 5.4 Discussion

The study findings suggest accessing cannabis for medical purposes in the period after the implementation of the MMPR, both within and outside the legal framework, led to substantial health, legal, financial and social consequences for patients using cannabis for medical purposes in Canada. These consequences stemmed, in part, from the criminalized context surrounding cannabis use, the stigma associated with cannabis, and the characteristics of access, including availability of different strains and products, and affordability. To our knowledge, this is the first study to examine the consequences of accessing cannabis for medical purposes. Evaluating the consequences of access to medical cannabis from a patient-centred perspective is an important part of determining if reasonable access has been
achieved, and will shed light on how reasonable or, alternatively, unreasonable, legal access to medical cannabis has been in Canada.

5.4.1 Health consequences of cannabis access

The experiences recounted by study participants suggest that the potential health benefits of cannabis can only be fully realized if those who have chosen cannabis as a treatment option are able to make optimal treatment choices in terms of what strains, products, and amounts of cannabis they are able to use. While participants in the current study reported experiencing symptom relief from the use of cannabis, they were unable to consistently control their symptoms due to the barriers they experienced in accessing medical cannabis through legal and illegal sources, such as lack of affordability and limited availability of strains and products. Two previous studies exploring barriers to medical access reported similar findings. In a qualitative study of patients accessing cannabis for medical purposes in Canada, both under the MMAR and outside the legal framework, participants reported that accessing unknown strains and quality of cannabis provided inadequate symptom relief or even worsened symptoms (Bottorff, Bissell, et al., 2011). In a cross-sectional study of medical cannabis patients in Canada conducted prior to the implementation of the MMPR, 54% of participants reported being unable to afford a sufficient quantity of cannabis to relieve symptoms (Belle-Isle et al., 2014). The inability to use medications as prescribed due to cost, also known as cost-related non-adherence, has been studied in Canada and other jurisdictions. Canada has one of the highest rates of cost-related non-adherence (8.2%) among 11 countries with universal health care systems. Not using medications as prescribed can also result in additional use of healthcare services, implying there are negative health consequences (Law et al., 2018;
Law, Cheng, Dhall, Heard, & Morgan, 2012; Morgan & Lee, 2017). A qualitative study of cost-related non-adherence in Canada, which examined the context and drivers of patient decisions to fill prescriptions, contended that income, insurance, and individual preferences interact, and recommended that policy interventions must address these issues concurrently (Goldsmith et al., 2017).

Not only were the potential health benefits of cannabis for medical purposes offset by barriers to access, study findings also suggest that additional negative health effects were experienced when access was not optimized; many participants experienced stress and anxiety in relation to the access experience itself, as well as in relation to not being able to adequately treat their symptoms, which in turn, exacerbated their symptoms. To our knowledge, this is the first study to identify stress as an outcome of barriers to accessing medical cannabis, and its potentially synergistic effect on other symptoms. Nor does it appear that stress related to access to other treatments has been studied. There is, however, growing attention on distress associated with disease-related symptoms or treatment-related side effects. Screening tools, which have been developed to help clinicians monitor and address such distress, have been demonstrated to improve psychological and physical symptoms and psychological well-being when implemented (Dhingra et al., 2017; Hong, Blonquist, Halpenny, & Berry, 2016; Watson et al., 2016). It may be worthwhile for clinicians to consider screening for distress associated with cannabis access as well. Additionally, studies have identified that other complementary therapies are used by patients to address symptom distress (Stomski et al., 2018). Participants in the current study, and others, have identified anxiety as a reason for cannabis use (Hazekamp et al., 2013; Reiman, 2007; Reinarman et al., 2011; Sexton et al., 2016; Swift et al., 2005;
Walsh et al., 2013, 2017). It would be of interest to further evaluate the source of anxiety and determine whether cannabis is being used specifically for symptom-related and treatment-related distress, as well as access-related distress. These findings suggest that structural changes to improve access to cannabis for medical purposes are needed to reduce the stress related to access.

Additionally, a notable finding from this study was that treatment choices about the use of prescription medications, such as opioids and benzodiazepines, were also impacted by participants’ access to appropriate and affordable cannabis strains and products. Participants in this study reported using cannabis as a substitute for prescription medications, which is consistent with other research documenting the “substitution effect” of cannabis (Bottorff, Bissell, et al., 2011; Lucas et al., 2016; Reiman, Welty, & Solomon, 2017). Similarly, participants in the present study used cannabis to avoid the adverse effects of prescribed medications and to achieve more effective symptom management. Several survey studies in Canada, the USA, and Israel have reported that a substantial percentage of cannabis users (46%-84%) are substituting cannabis for prescription medications, including those used for pain, anxiety, migraines and sleep issues (Abuhasira, Schleider, Mechoulam, & Novack, 2018; Boehnke, Litinas, & Clauw, 2016; Corroon, Mischley, & Sexton, 2017; Lucas et al., 2016; Lucas & Walsh, 2017; Piper et al., 2017; Reiman, 2009; Reiman et al., 2017). In relation to opioids, Corroon et al. (2017), reported that 97% of medical cannabis users that also used opioid-based pain medications reported substituting cannabis for these medications. Epidemiological studies also support this pattern of substitution, and demonstrate a reduction in the use of opioids and associated morbidity and mortality in USA states with medical cannabis programs (Bachhuber, Saloner, Cunningham,
Barry, 2014; Bradshaw, Atkinson, & Doody, 2017; Hutchinson, 2014; Merrill, Rhodes, Deyo, Marlatt, & Bradley, 2002; Peter & Watt-Watson, 2002). As a result of such findings, the use of cannabis has been proposed as a possible substitute or adjunct for opioids to reduce opioid-related mortality, improve pain management, and reduce healthcare costs (Beare Vyas, LeBaron, & Gilson, 2017; Hurd, 2017; Lau et al., 2015; Lucas, 2017). Regarding the consequences of access to cannabis, it appears that increased access to cannabis for medical purposes could help quell the current opioid overdose crisis in Canada, and elsewhere in North America. Further, pain is the most commonly reported reason for medical cannabis use in Canada as well as internationally; in previous studies, 29-82% of survey respondents indicated pain as the primary reason for using cannabis (Bonn-Miller, Boden, Bucossi, & Babson, 2014; Hazekamp, Ware, Muller-Vahl, Abrams, & Grotenhermen, 2013; Reinarman, Nunberg, Lanthier, & Heddleston, 2011; Sexton, Cuttler, Finnell, & Mischley, 2016; Swift, Gates, & Dillon, 2005; Walsh et al., 2013). Reduced access could therefore further exacerbate the opioid epidemic.

Access to cannabis has some parallels with access to opioids, both being associated with barriers stemming from cumbersome requirements for access, fear among healthcare providers of legal sanctions, and the high cost of treatment (Lohman et al., 2010). Another parallel is distrust between healthcare providers and patients; both substances are viewed as a drug susceptible to abuse, and patients requesting pain management are often perceived as “drug seeking” (Buchman & Ho, 2014; Matthias et al., 2010; Merrill et al., 2002; J. Miller, 2007). Additionally, both substances are subject to restrictive drug control regulations. International treaties, which restrict access to some drugs, including opioids and cannabis, permit access for
strictly medical and research purposes, which has allowed countries, including Canada, to create programs for medical access (Hoffman & Habibi, 2016). Access to pain management has been put forward as a fundamental human right, in light of the adverse physical and psychological effects and social and economic costs of untreated pain (Brennan, Carr, & Cousins, 2007; Lohman et al., 2010). Due to the suffering associated with inadequate access to pain medication, the United Nations Single Convention on Narcotic Drugs declared the medical use of narcotic drugs indispensable for the relief of pain and mandated adequate provision for medical use (United Nations, 1972). While this stance has been articulated in connection specifically to opioids, given the growing amount of clinical research suggesting cannabis is effective for pain management (Abuhasira et al., 2018; Aggarwal et al., 2009; Hill, 2015; Jensen, Chen, Furnish, & Wallace, 2015; Lynch et al., 2006; Savage et al., 2016; Ware et al., 2015; Ware, Doyle, et al., 2003; Whiting et al., 2015), it could also potentially apply to cannabis use for medical purposes; however, it is not clear that such an interpretation would facilitate access given the experience with opioids.

Additionally, the current study findings suggest that the sense of control experienced by medical cannabis users is impacted by their access experience. The use of cannabis provided participants with a sense of control over their illness as a result of being able to decide, independently or in conjunction with a healthcare provider, to use cannabis as a treatment option, as well as to determine the amount, strains and products used. Patients have described similar feelings of control in relation to the use of natural health products and complementary medicines (Ernst & Hung, 2011; Henderson & Donatelle, 2004; Schützler & Witt, 2014; Truant & Bottorff, 1999). In the case of personal production, participants also felt they had control over the quality of
their medicine. Study participants considered such control to be a health benefit, distinct from the effectiveness of cannabis in treating their symptoms. Other research corroborates that a sense of control is associated with health outcomes; for example, studies have reported that a low sense of control is associated with poorer self-rated health and more illness episodes, whereas higher levels of health-related personal control are associated with better quality of life and lower levels of depression (Kidd et al., 2016; Seeman & Seeman, 1983). Similarly, in previous qualitative studies of medical cannabis patients in Canada and the UK, patients construed cannabis as a means to self-management, which was perceived as a health benefit of cannabis use (Bottorff, Bissell, et al., 2011; Coomber, Oliver, & Morris, 2003). In Bottorff et al.’s (2011) study, as well as the current study, the impetus for self-management in relation to cannabis included the desire to find safer and more effective alternatives to prescription medication, the illegal status of cannabis which required discretion, and healthcare providers’ relative lack of knowledge about the medical applications of cannabis, and in many cases, their lack of support. Studies have identified knowledge gaps and educational needs among Canadian physicians and nurses regarding the medical use of cannabis, and curricula have been proposed to address them (Balneaves et al., 2018; Ware & Ziemianski, 2015; Ziemianski et al., 2015).

The concept of patient autonomy, which encompasses an individual’s right to make choices for themselves that reflect their preferences and values, is considered an important ethical principle in health care, and a central tenet of patient-centred care (Ells, Hunt, & Chambers-Evans, 2011; Entwistle, Carter, Cribb, & McCaffery, 2010). Relational autonomy, which builds upon patient autonomy to recognize the larger social and system context of autonomy, including the identity, values, and social
context of the patient, as well the structures and polices of the clinical setting, has been proposed to support the goals of patient-centred care (Ells et al., 2011; Sherwin, 2012). Regarding access to medical cannabis, despite the existence of a medical cannabis program in Canada, there are social and system structures that limit patients’ ability to access medical cannabis as a treatment option, thereby diminishing their ability to fully actualize their autonomy. For example, participant narratives in the current study and past research (Belle-Isle et al., 2014; Belle-Isle & Hathaway, 2007; Walsh et al., 2013) suggest that the reluctance of physicians to support patients to access the legal medical cannabis program has acted as a major barrier to access. The illegal status of cannabis and the requirement for physician support to legally access cannabis for medical purposes may create a paternalistic and challenging dynamic, which could conflict with patient-centred care (Christman, 2014). In terms of the social context of this dynamic, a patient’s identity and values might include a preference for the use of cannabis over pharmaceutical drugs, and an ideological opposition to the criminalization of cannabis; such identities and values may not be shared by their physician. On a system level, the colleges and insuring bodies of physicians and nurse practitioners, who are also designated under the medical cannabis regulations to authorize cannabis for patients, have issued statements cautioning such actions, and questioning the necessity for a medical cannabis program after recreational cannabis is legalized (Israel, 2018; Owens, 2018). A recent national guideline for family physicians in Canada recommended limited use of medical cannabis across disease groups, due in part to limited high quality randomized controlled trials supporting effectiveness and concern about potential harms (Allan et al., 2018). To achieve reasonable access in the context of patient-centred care, these social and system
dynamics must be balanced with respect for patient autonomy. The importance placed by patients on their sense of control and autonomy may also explain their use of illegal sources of cannabis, which they can access without the support of healthcare professionals.

5.4.2 Legal consequences of cannabis access

The findings from this study also shed light on the legal repercussions of medical cannabis access. Participant narratives indicate that individuals using cannabis for medical purposes do so on a continuum from legal to illegal access, depending on the extent to which they could access the legal system, and how well the legal system met their health needs. Participants feared, and some experienced, serious legal repercussions when they strayed beyond the bounds of the law, including arrests, convictions, criminal records, and children being taken into custody by government agencies. As a result, legal access was aspired to by most participants. It is thus concerning that many individuals who had registered in legal medical cannabis program described being forced to use illegal sources to meet their health needs due to inadequacies related to available and affordable cannabis products. The study findings also indicate that policy issues during the transition period between the MMAR and MMPR (e.g., not allowing individuals to change their production address) left many individuals confused and vulnerable to criminal sanctions despite their best intentions to comply with the law (Davison, 2014).

With the upcoming legalization of cannabis for recreational purposes in Canada, the threat of legal repercussions will be removed to a large extent. However, some of the laws and regulations surrounding production and use may still have
repercussions for medical cannabis users, many of whom are accessing cannabis outside the legal framework. For example, new proposed laws for cannabis and driving in Canada are based on assessments of use rather than impairment, and do not include exceptions for medical users, as is done in other jurisdictions (Capler, Bilsker, Van Pelt, & MacPherson, 2017; House of Commons of Canada, 2017b; Vindenes et al., 2012). Additionally, with approximately 270,000 individuals currently registered in the ACMPR out of an estimated 1 million medical cannabis users in Canada (Health Canada, 2018c), and many of those registered still accessing cannabis outside the program, new cannabis legislation that proposes increased penalties for illegal production and sales (House of Commons of Canada, 2017a) may have implications for medical users. Likewise, provincial and territorial legislation for legalized cannabis, which stipulates where cannabis can be used for recreational purposes (Fraser, 2018), may also impact where cannabis can be used for medical purposes.

While most participants in this study indicated that they believed the legal program for medical cannabis offered them legal protection, a few believed that engagement in the program could increase the probability of legal consequences by drawing police or government attention to their cannabis use. Concern about such unwanted scrutiny was also reported in a previous qualitative study of medical cannabis users with multiple sclerosis in Canada (Page & Verhoef, 2006). Privacy breaches on the part of Health Canada in the past have shaken the trust of some medical cannabis patients and have led to a class action suit (Branch MacMaster LLP, 2018; R. v. John Doe, 2016). This distrust is not surprising given the many years of cannabis prohibition in Canada, and the criminal persecution many cannabis users
have experienced (Government of Canada, 2017c). As a result, some participants in this study expressed greater trust in the illegal market, particularly dispensaries. Community-based dispensaries, which have been identified as a highly accessed source of cannabis for medical users in Canada (Walsh et al., 2013), may be perceived by medical cannabis users as a middle ground; previous research points to the use of dispensaries to minimize involvement with overt criminal activity, as well as high ratings for feelings of safety accessing cannabis from dispensaries, despite their illegal status (Bottorff et al., 2013; Capler, Walsh, et al., 2017). Narratives in the current study indicate confusion around the legal status of dispensaries, which made it difficult for participants to make informed decisions about potential legal consequences of access. Further complicating patients’ understanding of the legal status of dispensaries, since this study was completed, some Canadian municipalities have provided business licenses to dispensaries (Lough, 2015). These establishments, however, remain illegal at a federal level and many are operating without a permit or approval (Fearon, 2015). Additionally, regulatory plans for public and/or private recreational cannabis storefront retail shops differ across provinces and territories (Fraser, 2018); however, this retail model will not apply to cannabis for medical purposes, which will still be legally available only through the sources of access sanctioned under the ACMPR. This level of complexity may further obfuscate the legal status of cannabis storefronts, should illegal dispensaries continue to operate.

Participants in the present study also discussed the moral implications of accessing medical cannabis. Being forced to access cannabis for medical purposes outside the legal framework was morally challenging for those who were otherwise law-abiding. Cannabis laws, like those for many other controlled substances, have
been steeped in morality issues, and it has been suggested that medical cannabis regulations are also infused with these moral overtones (Euchner, Heichel, Nebel, & Raschzok, 2013; Ferraiolo, 2014; Lucas, 2009). It is interesting to note that the medical cannabis regulations were initiated and amended by court decisions enshrining the rights to health and liberty in relation to medical cannabis, as a result of patients and cannabis providers who were willing to engage in ‘civil disobedience’, differentiating their legal responsibilities from their moral imperatives to reduce suffering (Capler, 2010; Penn, 2014; R. v. Parker, 2000; Stamps, 2016). The new recreational cannabis regulations appear to be replacing morality with public health values and commercial interests. The changing legal and social context of cannabis use may influence future changes to medical cannabis regulations, and impact the moral consequences experienced by medical cannabis patients. Patients may also be able to avoid the moral quandary of accessing cannabis illegally as they will have another legal route to access cannabis, albeit not specific to medical use, as the new regulations provide for legal storefront retail shops.

5.4.3 Financial consequences of cannabis access

Findings from this study also shed light on the financial consequences of access to cannabis for medical purposes. Affordability has been identified in previous research as a barrier to accessing medical cannabis in Canada and the UK (Belle-Isle et al., 2014; Belle-Isle & Hathaway, 2007; Coomber et al., 2003; Page & Verhoef, 2006), however, this is the first study to our knowledge that considers in depth the financial repercussions on patient’s lives. Participants recounted how the high cost of cannabis from some legal and illegal sources led to financial challenges, whereby they had to tightly ration their medicine, juggle their household budgets, and choose between
cannabis and other life necessities, including food. Although financial consequences were felt by all medical cannabis users, the implications were greatest for those with low income. These findings are consistent with a previous Canadian study in which 33% of respondents to a large national survey of individuals using cannabis for medical purposes reported having to choose between cannabis and other necessities, including 50% of individuals who reported the lowest income, and 48% of those with the poorest self-rated health (Belle-Isle et al., 2014). Similar consequences have been reported in research looking at the charges to patients for prescription drugs in Canada and the USA. In a large national telephone survey of 28,901 Canadians, Law et al. (2018) found that despite partial coverage for prescribed medication, patients in Canada forewent basic needs, including food, heat and other healthcare services because of medication cost. They estimated 1.45 million Canadians reduce spending on these other household expenses, with females, younger adults (18-44 years), Aboriginal people, those lacking insurance, those reporting lower income, and those reporting poorer health status being more likely to make trade-offs between prescription medication and basic necessities. Similar results were reported in a national survey of 4,055 Americans taking prescription drugs for chronic illnesses; 22% respondents reported having to cut back on necessities, and 16% had increased their debt burden (Heisler, Wagner, & Piette, 2005).

Additionally, the participants in the current study indicated that the planned phasing out of self-production in favour of LPs under the MMPR was causing great financial anxiety. At the time of the current study, there was a court injunction extending the MMAR provisions for self-production and designated production until a constitutional challenge could be heard (Allard et al. v. Canada, 2014). One of the main
concerns of the patients who brought the case forward was the loss of affordable options for accessing cannabis. The court case, heard after data collection was completed for this study, declared the MMPR unconstitutional for omitting these affordable options (Allard et al. v. Canada, 2016). Self-production and designated production were later re-instated under the ACMPR; however, while these methods of production address affordability and thus mitigate financial consequences for some patients, not all individuals are able to produce their own cannabis or establish a designated producer.

Affordability is still reported to be an issue under the ACMPR for many patients, and the findings from the current study underscore the repeated calls by patients for cost coverage by private and public health insurance and reduced taxes on medical cannabis to conform to the tax scheme for other prescription medications in Canada (Canadians for Fair Access to Medical Marijuana, 2018). While there has not yet been any apparent movement in this direction by federal or provincial/territorial governments, a private insurer has recently announced they will be providing coverage for medical cannabis, in certain circumstances (Ligaya, 2018). A pilot study has also recently been announced at the Okanagan campus of the University of British Columbia to provide medical cannabis coverage for students while assessing potential cost savings to the health care system (Hayes, 2018). Participants in the present study identified some strategies that were in place to address the high cost of cannabis, such as “compassionate” subsidy programs offered by some LPs for low-income clients, however, such programs were up to the discretion of individual LPs, and had limits on the quantity of cannabis to which subsidies applied. Participants also mentioned a program under Veterans Affairs
Canada, providing cost coverage for veterans, which had improved under the MMPR by providing for direct billing by LPs to Veterans Affairs (Veterans Affairs Canada, 2017). However, as a result of the high cost of the program, the subsidy was reduced to a maximum of 3 grams per day, which some veterans report is an insufficient amount to meet their needs (Leeder & Galloway, 2018). This highlights the unintended consequences of third party cost-coverage, and subsequent tension between increased program costs and meeting patient needs.

Possibly further increasing the cost of cannabis for patients, the government of Canada has proposed an excise tax on cannabis as part of the upcoming measures for legal recreational cannabis, which they have stated will apply to medical cannabis as well (Department of Finance Canada, 2017a). Of particular concern, the lack of affordability of cannabis has serious financial and health consequences that can lead to undue suffering, contradicting an overarching objective of federal health care policies “to ensure no Canadian suffers undue financial hardship as a result of having to pay health care bills” (Standing Senate Committee on Social Affairs Science and Technology, 2002) and also contradicting the spirit of universality in Canadian health care, which ensures access to publically funded health services to everyone, everywhere, regardless of income, age and health status (Canada Health Act, 1984).

5.4.4 Social consequences of cannabis access

The findings from this study also shed light on some of the social consequences of accessing cannabis for medical purposes in Canada. In particular, participants described the stigma they experienced in various areas of their lives in relation to their medical use of cannabis. Stigma is defined as “a simplified, standardized image of the
disgrace of certain people held in common by a community at large” (Smith, 2007; p. 464); stigmatization involves being discredited due to certain attributes and is often linked with prejudice and discrimination (Brohan, Slade, Clement, & Thornicroft, 2010; Earnshaw & Quinn, 2012; Link & Phelan, 2001). The experience of stigma can include anticipated, experienced, and self- or internalized stigma, which interact with each other such that individuals who internalize stigma and experience stigma may anticipate greater stigma (Brohan et al., 2010; Earnshaw & Quinn, 2012; Hing & Russell, 2017).

Participants described the stigma they experienced as resulting from the perceived connection between cannabis and criminal activity, and other controlled drugs used for recreational purposes, and the associated negative labels and stereotypes. Illicit drug users are a highly stigmatized group (Ahern, Stuber, & Galea, 2007), and the stigmatization associated with cannabis has been addressed in previous research (Erickson & Goodstadt, 1979; Hathaway, 2004; Hathaway, Comeau, & Erickson, 2011). Participants also described stigma as stemming from a lack of understanding, or disbelief, about the potential medical efficacy of cannabis. Stigma may be experienced to a greater extent by some patients than others; negative attitudes toward medical cannabis have been found to be exacerbated for patients with stigmatized medical conditions, such as HIV/AIDS and mental health conditions (Bottorff et al., 2013; Leos-Toro, Shiplo, & Hammond, 2018; Lewis & Sznitman, 2017). Anticipated stigma from health care practitioners may also impact access to healthcare for medical cannabis users with chronic conditions; previous research has found that patients with chronic illnesses who anticipated greater stigma
from healthcare workers, in turn, accessed healthcare less and experienced a decreased quality of life (Earnshaw & Quinn, 2012).

Because of the stigma they experienced, anticipated, or internalized, many participants were careful to distinguish their medical use of cannabis from illegal or recreational use; this desire to delineate between medical and recreational use by medical cannabis users was reported in previous qualitative studies (Bottorff et al., 2013; Page & Verhoef, 2006; Pedersen & Sandberg, 2013). The findings from the current study also substantiate previous qualitative studies in Canada and the USA, which reported that stigma related to medical cannabis use negatively impacted social and professional interactions, as well as relationships with family, friends, landlords and others in society, leading to a sense of isolation and estrangement (Bottorff et al., 2013; Satterlund et al., 2015). Similarly, in a recent online cross-sectional survey of 276 medical cannabis users in Canada authorized under the MMPR, 79.3% of respondents reported hiding their cannabis use to avoid judgment, and less than 44% reported perceiving societal approval of their medical cannabis use (Leos-Toro et al., 2018).

Some participants hoped to differentiate their medical cannabis use from recreational use by registering in a legal medical cannabis program. Indeed, many of the participants in the present study perceived the legal program to confer legitimacy to their medical use and allowed them to feel more confident speaking about their use of cannabis with healthcare providers as well as other people in their lives, which was believed to be an important strategy for reducing stigma. It is also of interest to note that stigmatization of cannabis use has been found in relation to the modes of consumption, such that those using cannabis for medical purposes view non-inhaled forms of cannabis more favorably (Rudski, 2014). The desire to reduce stigma may
explain both participation in the legal cannabis program by some study participants, as well as their elevated use of alternative forms of cannabis (Section 3.3.4).

Conversely, many participants felt that neither the existence of the program, nor registering in it, necessarily helped reduce stigma. This may be, in part, because the medical cannabis program itself did not recognize the legitimacy of cannabis as a medicine, nor did medical associations and colleges in Canada (Canadian Medical Association, 2013). Additionally, some participants felt that following the implementation of the MMPR, the program was being reframed as a business opportunity for LPs, especially after the announcement of legalized recreational cannabis in Canada and the central role LPs would be playing in that market, as well as in global markets (Subramaniam, 2017). This perception has also been heightened by the prominence of Canadian LPs on the publically traded stock market (Castaldo, 2018). These perceptions about the medical cannabis program may have distracted from an increased understanding of medical cannabis use; instead, medical cannabis patients continued to be perceived to be engaging with the program as an excuse to get high legally.

Finally, these findings also suggest that the experience of stigma may impact the sources of cannabis used by patients. Participants described accessing cannabis where they could find acceptance and validation of their medical use of cannabis. As reported in previous research, for some, this sense of community and legitimacy was found in dispensaries, which although illegal, catered to and advocated for individuals using cannabis for medical purposes (Capler, Walsh, et al., 2017; Hathaway & Rossiter, 2007; Penn, 2014; Reiman, 2008). The upcoming legalization of cannabis may further enhance the trend toward the normalization of cannabis use,
thereby reducing stigma for recreational users (Duff et al., 2012; Haines-Saah et al., 2014; Hathaway et al., 2011); however, it is unclear what the impact will be on attitudes towards medical cannabis use and if medical users will continue to prefer to differentiate themselves from recreational users. Thus, while storefront cannabis retail outlets, both private and public, which will be part of the new legal framework for recreational cannabis in some provinces and territories, may provide a new non-stigmatizing legal source of cannabis for medical users, it is unknown if medical cannabis users will choose to access cannabis through these recreational-focused sources. A more recent cross-sectional online survey of patients accessing cannabis under the MMPR found that respondents who reported sourcing their cannabis from illegal sources were 2.7 times more likely to report a perceived absence of societal approval for their use of medical cannabis than those sourcing from a legal source (Leos-Toro et al., 2018). Given the potential negative impact of stigma on personal and professional relationships, isolation, and access to healthcare, for reasonable access to be achieved, stigma experienced by medical cannabis users must be addressed.

5.4.5 Implications and limitations

The health, legal, financial and social consequences experienced by study participants accessing cannabis for medical purposes, both within and outside the legal program, suggest that reasonable access to cannabis had not been achieved as a result of the implementation of the regulations for medical cannabis access in Canada at the time of the current study. These findings suggest a need for changes at the policy and program levels to address the barriers to access, and mitigate the consequences experienced by patients. For example, policies allowing for personal production and the provision of different forms of cannabis, including edibles, are
needed to address both health and financial consequences. Policy changes that could help mitigate financial consequences include removing sales and excises tax from medical cannabis, supporting the subsidization of medical cannabis through private and public insurance plans by providing a drug identification number for cannabis, and allowing for local access in order to eliminate shipping fees. Some changes at the program level could also reduce the cost of cannabis; for example, allowing for payment on delivery, lower minimum purchase requirements, and simplified packaging. Public education to counter stereotypes about cannabis users, and to provide information about the effects of cannabis use and the applications of medical cannabis, as well as positive messaging from the government about the medical cannabis program could help address some of the stigma experienced by medical cannabis users. Furthermore, this study suggests that transition periods between regulatory changes require careful attention, evaluation and support for patients. As Canada shifts its policy objectives related to cannabis, and medical cannabis use moves into a context of legalized cannabis for recreational use, it is important to assess the impact of these changes on access for medical use and the associated consequences.

Given that reasonable access is a key goal of the federal medical cannabis program, it is important to regularly evaluate if this goal is being met from a patient-centred perspective. To this end, it is vital to listen to the lived experiences of those using cannabis for medical purpose, and how their access experience affects their lives. To date, research related to medical cannabis access has studied who is using cannabis and for what reasons, as well as barriers to access. It is our understanding that this is the first study to specifically explore the consequences of access on the lives
of those using cannabis for medical purposes for a variety of medical conditions both within and outside of the legal framework in Canada since the implementation of the MMPR to ascertain if reasonable access has been achieved. Future research on access to medical cannabis under the ACMPR and in the context of legalized recreational cannabis use should assess the consequences related to the access experience, and for whom they are most salient.

The findings of the current study need to be considered in light of several limitations. The findings may not represent the full range of experiences with access to cannabis for medical purposes, and may not be generalizable to other settings. Foremost, the participants were recruited from a pool of self-selected survey respondents (see limitations Section 3.4.3) who may have been motivated by exceptionally positive or negative experiences to participate in the study. Efforts were made to obtain a balance in age, gender, authorization group, however, there may be other relevant subpopulations that were not included. This may include specific ethno-cultural or disease groups. The contextual framing of some questions, which was intended to encourage participants’ reflections about their access experiences, may have inadvertently introduced bias, leading participants to relay only negative experiences. It is also important to acknowledge the study occurred during a period of transition between the MMAR and MMPR, which were replaced by the ACMPR in 2016 after data was collected for this study. The ACMPR, however, retains essential elements from both of the former medical cannabis regulations, and provides legal access to cannabis through the same sources that were available under both previous regulations. It is also important to note that this study took place during the early stages of MMPR when there were less than 20 LPs that were just beginning to launch.
their operations, including product development. Although it is likely that some aspects of the access experience have changed since the time of the study as result of the aforementioned changes to the federal program, and the increased number of LPs, many aspects are still relevant, including the high price of many cannabis products, the limits regarding the type of cannabis products available, and the process for online purchasing and payments. With legalization of recreational cannabis fast approaching in Canada, the context of illegality and stigma is also anticipated to change to some extent. This study thus provides an important baseline to identify shifts that occur in both barriers to access and consequences for those accessing cannabis for medical purposes.
Table 5.1 Sociodemographic characteristics of qualitative study participants (n=33)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorization group (at time of interview)</td>
<td></td>
</tr>
<tr>
<td>MMAR</td>
<td>11 (33)</td>
</tr>
<tr>
<td>MMPR</td>
<td>9 (27)</td>
</tr>
<tr>
<td>No HC</td>
<td>8 (24)</td>
</tr>
<tr>
<td>Not Current</td>
<td>5 (15)</td>
</tr>
<tr>
<td>Age Range</td>
<td>28-76 years</td>
</tr>
<tr>
<td>Median</td>
<td>47 years</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>15 (45)</td>
</tr>
<tr>
<td>Male</td>
<td>17 (52)</td>
</tr>
<tr>
<td>Transgender</td>
<td>1 (3)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>28 (85)</td>
</tr>
<tr>
<td>First Nations/Metis</td>
<td>5 (15)</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
</tr>
<tr>
<td>Suburban/urban</td>
<td>24 (73)</td>
</tr>
<tr>
<td>Rural/remote</td>
<td>9 (27)</td>
</tr>
<tr>
<td>Province</td>
<td></td>
</tr>
<tr>
<td>Ontario</td>
<td>13 (39)</td>
</tr>
<tr>
<td>BC</td>
<td>6 (18)</td>
</tr>
<tr>
<td>Prairie (Manitoba, Saskatchewan, Alberta)</td>
<td>4 (12)</td>
</tr>
<tr>
<td>Quebec</td>
<td>4 (12)</td>
</tr>
<tr>
<td>Atlantic (Newfoundland/Nova Scotia)</td>
<td>3 (9)</td>
</tr>
<tr>
<td>Income *</td>
<td></td>
</tr>
<tr>
<td>&lt;$20,000</td>
<td>6 (18)</td>
</tr>
<tr>
<td>≥$20,000</td>
<td>26 (79)</td>
</tr>
<tr>
<td>Medical Conditions **</td>
<td></td>
</tr>
<tr>
<td>Chronic pain</td>
<td>19 (58)</td>
</tr>
<tr>
<td>Arthritis</td>
<td>15 (45)</td>
</tr>
<tr>
<td>Anxiety/depression</td>
<td>11 (33)</td>
</tr>
<tr>
<td>Crohn’s/colitis/IBS</td>
<td>8 (24)</td>
</tr>
<tr>
<td>Fibromyalgia</td>
<td>7 (21)</td>
</tr>
<tr>
<td>Cancer</td>
<td>5 (15)</td>
</tr>
<tr>
<td>PTSD</td>
<td>4 (12)</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>3 (9)</td>
</tr>
<tr>
<td>Other</td>
<td>16 (48)</td>
</tr>
</tbody>
</table>

No HC: No Health Canada; MMAR: Marihuana Medical Access Regulations; MMPR: Marihuana for Medical Purposes Regulations

* one respondent did not answer this question

**respondents were able to select more than one medical condition
CHAPTER 6: CONCLUSION

6.1 Summary of Findings

This dissertation examined the experiences of adults accessing cannabis for medical purposes in Canada, following the implementation of the MMPR in 2013. The literature review in Chapter 2 identified patient- and system-related factors associated with accessing cannabis for medical cannabis in Canada and other jurisdictions, and theorized how these factors might impact the different stages of access outlined in the Levesque model of access to health care (Levesque et al., 2013). The results indicate there were various barriers to accessing cannabis under the previous regulations in Canada (MMAR); however, since the implementation of the MMPR, there has been no rigorous national evaluation to assess the impact of the regulatory changes on access. It is possible that factors relevant to measuring access to medical cannabis from a patient-centred perspective may not have been identified in past research, particularly regarding the consequences of the access experience. A mixed methods study design would permit the factors influencing patients’ access to medical cannabis to be more fully elucidated, and to expand our understanding of what constitutes reasonable access from a patient-centred perspective.

Using cross-sectional data obtained from an online survey administered to a national sample of adults using cannabis for medical purposes in Canada, Chapter 3 sought to assess patient- and system-related factors associated with ‘authorization status’, comparing individuals authorized under the MMAR, the MMPR and those not authorized under the federal medical cannabis program. Differences were found between groups in terms of sociodemographic and health-related factors, patterns of
use, and problems experienced with access. Specifically, female participants and those with mental health conditions were more likely be authorized under the MMPR than the MMAR, and fewer individuals from Nova Scotia and British Columbia compared to Ontario were authorized under the MMPR. In terms of patterns of use, individuals in the MMAR group used the highest amounts of cannabis and those not authorized used the least. Smoking was the most commonly used route of administering cannabis regardless of authorization status, which mirrors previous studies of medical cannabis users in Canada and other jurisdictions (Belle-Isle et al., 2014; Hazekamp et al., 2013; Pacula et al., 2016; Reinarman et al., 2011; Sexton et al., 2016; Swift et al., 2005). In this study, participants in the MMPR group were less likely to report smoking as their mode of using cannabis than unauthorized participants. Furthermore, individuals with legal authorization status (MMAR and MMPR) were more likely to vaporize than those not authorized. Individuals authorized under the MMAR were more likely than those not authorized to use edibles, and more likely than those in the MMPR group and those not authorized to use other alternatives to inhalation (i.e., tinctures, topicals and juicing), despite the fact that these products were not legally available. With respect to problems experienced with access, individuals with legal authorization, particularly under the MMPR, reported relatively more problems with access than those authorized under the MMAR or those outside the legal program, including problems with the cost of cannabis, finding effective strains and products, availability of strains, and waiting times to receive product and for registration in the program. Overall, the findings from Chapter 3 indicate that changes to the regulatory framework may have resulted in increased access to authorization for some individuals and decreased access for others, while
problems with access to medical cannabis within the program continued for authorized users. These results suggest that reasonable access was not provided by the legal program for medical cannabis access in Canada at the time of the study.

This dissertation also sought to gain an understanding of why some individuals who were authorized under the federal regulations and had access to a legal supply of cannabis were nonetheless using cannabis from illegal sources. To this end, Chapter 4 compared individuals authorized under the MMAR and MMPR that were using only legal sources of cannabis to those using illegal sources only or in addition to legal sources. Few patient-related factors were found to be associated with ‘source status’ in terms of sociodemographic or health-related factors. However, individuals accessing from only legal sources differed from those accessing from illegal sources with respect to the importance they place on different characteristics of medical cannabis products and services. Individuals who reported using illegal sources compared to those accessing from only legal sources were significantly more likely to value pesticide-free cannabis, having access to a variety of strains, being able to purchase cannabis in small quantities, access from a community-based dispensary, and the ability to select strain and dosage, and to observe and smell the product before purchase. Chapter 4 also examined participants’ perceptions regarding the quality of cannabis products and services offered by different sources to ascertain if there was a perceived difference between legal and illegal sources. No significant differences were found regarding perceived quality of cannabis products between legal and illegal sources; however, illegal sources were perceived to provide higher quality services, including quality of care, expertise and support, and administration and accessibility. The findings also suggest that regardless of legality of the source, participants were
most satisfied overall with sources closest to production (i.e., personal production with a license and designated production), and those providing in-person, personalized service (i.e. dispensary and close friend or family). These findings highlight some of the reasons authorized users may access sources beyond the legal sources available to them and suggest that reasonable access may not have been provided by the legal program with respect to sources.

Consequences are the final stage of health care access in the Levesque model, and entail the outcome of the previous stages. In Chapter 5, data from in-depth interviews with 33 participants from across Canada were analysed to explore the health, legal, financial and social consequences they experienced in relation to accessing cannabis for medical purposes. From participants’ narratives, we learned that the ability to manage symptoms and make treatment choices about the use of cannabis and other medications was greatly impacted by having timely access to adequate amounts of cannabis, and effective strains and products. Participants’ sense of autonomy and control over their health and health care was enhanced through producing their own cannabis supply, but was thwarted by a lack of support from healthcare practitioners regarding the legal use of medical cannabis. The challenges experienced by participants in accessing the legal program and deficiencies associated with legal sources led many patients to access cannabis outside the legal framework, which meant contending with legal consequences, including potential encounters with the criminal justice system and transgressing their moral values regarding obeying the law. In addition, the financial burden experienced by participants using medical cannabis forced many to make tradeoffs between achieving symptom relief and other basic life necessities, such as rent and groceries. Despite the existence of a
legal cannabis program in Canada, many participants we interviewed continued to experience stigma related to cannabis in various realms of their lives. Overall, the stress that patients experienced related to their attempts to access appropriate cannabis products and services, as well as coping with the negative health, legal, financial and social consequences, contributed to a further deterioration in their health. This analysis provided a deeper understanding of how the patient- and system-related factors associated with access at earlier stages of medical cannabis access, as elucidated in Chapter 3 and 4, impacted the consequences experienced by patients related to accessing medical cannabis. The findings suggest that the intended outcome of legal access to cannabis for medical purposes (i.e., protecting Canadians’ constitutional rights to health and liberty) was not met; instead, patients faced unintended health, legal, social and financial consequences. In summary, the findings from Chapters 3 to 5 suggest that despite the implementation of the medical cannabis program and changes to the regulations, reasonable access to cannabis for medical purposes had not been achieved in Canada from a patient perspective at the time of this study.

6.2 Implications

Collectively, the findings of this dissertation highlight various implications for access to cannabis for medical purposes in Canada. Although the ACMPR replaced the MMPR in 2016, many of our study findings remain relevant to the current policy environment. The ACMPR retains elements from both former medical cannabis regulations (MMAR and MMPR); the ACMPR provides legal access to cannabis through the same sources that were available under both previous regulations, and the application process is the same for the respective sources. However, the study
findings must also be considered in light of other changes that have occurred, such as the increased number of LPs and the additional forms of cannabis that have been made legally available. Additionally, with legalization of recreational cannabis expected to occur imminently in Canada, the context of illegality and stigma is also anticipated to change; however, it is not clear exactly in what manner and to what extent this will impact medical cannabis users. Thus, this study provides an important basis for identifying shifts that occur in both barriers and facilitators to access, and consequences of access, for those accessing cannabis for medical purposes in Canada. Utilizing a patient-centred model of access to health care, such as the Levesque model, to conceptualize access to medical cannabis can provide insight into how policies and programs could be modified to target relevant factors at different stages of access to achieve reasonable access within a complex context of regulatory and societal changes related to cannabis.

As discussed in Chapter 3, differences in patient-and system-related factors between authorization groups suggest that changes to regulations under the MMPR may have had an impact on access to the medical cannabis program. For example, the increased participation of females in the MMPR compared to MMAR may be related to a preference for access through LPs than through the legal sources provided under the MMAR (i.e., personal and designated production). An increase of female participants have been reported in other surveys of medical cannabis users (de Hoop et al., 2018; Sexton et al., 2016), suggesting there may be a trend of increased medical cannabis use, or reporting, among females that coincided with the timing of the implementation of the MMPR. Other changes to the regulations, such as removing the requirement of a second opinion from a healthcare professional, may have facilitated
access for some individuals in Canada who choose to use cannabis for medical purposes, including individuals who may struggle with accessing healthcare services in general, such as those with mental health conditions (Corrigan, Druss, & Perlick, 2014). This could greatly increase access to authorization, given that mental health conditions are one of the most commonly reported reasons for medical cannabis use (Bonn-Miller et al., 2014; Reinarman et al., 2011; Sexton et al., 2016; Walsh et al., 2013). Conversely, the changes to the regulations, including the withdrawal of personal and designated production under the MMPR, appeared to have resulted in a lower proportion of residents of British Columbia and Nova Scotia compared to Ontario accessing the legal program. This may reflect regional preferences, attitudes, and norms regarding self-production or accessing from local sources (i.e., dispensaries) versus accessing from LPs, which were located primarily in Ontario at the time of the study. The reinstatement of personal and designated production of cannabis under the ACMPR in 2016, and more licenses being given to producers in British Columbia and Nova Scotia (Health Canada, 2018a), may have facilitated access for individuals living in these provinces. Of interest, legislation and regulations for recreational cannabis are expected to differ across the provinces and territories; to the extent that these regulations consider regional preferences (e.g., a preference for private retailers and “craft cannabis” in British Columbia), they may also engender participation in the legal market for both recreational and medical cannabis users (Canadian Association of Medical Cannabis Dispensaries, 2017b; Craft Cannabis Association of British Columbia, 2016, 2017; Rendell, 2018; The Canadian Press, 2018). The substantial increase in enrollment under the ACMPR, to ~ 270,000 (Health Canada,
may reflect that the changes to the regulations increased access to the groups of individuals identified in this study.

The findings from Chapter 3 also suggest that regulations have the potential to influence patterns of cannabis use for medical purposes. Increased affordability from personal and designated production may lead to use of greater amounts of cannabis and use of alternative forms to inhalation (e.g., edibles) that require greater quantities to produce. The affordability of these options led to a court decision that they must be offered by the legal program (Allard et al. v. Canada, 2016), and subsequently they were reinstated under the ACMPR. From our data, it is unclear if the relatively elevated amounts of cannabis used by individuals in the MMAR compared to other authorization groups reflected actual amounts needed, or implied unmet need in those accessing cannabis under the MMPR or outside the federal program. However, as described by participants in Chapter 5, the affordability of cannabis directly affected the amount of cannabis patients could use, which greatly impacted their health outcomes, choice of source, and financial well-being. Regarding the modes of cannabis use, it appears that contact with health care providers as mandated by the legal system may encourage use of vaporization as well as non-smoked forms of cannabis use, which may be a benefit of having a separate medical cannabis system from the recreational system. Patients’ preferences regarding cannabis products also appeared to impact their decision whether to register in the legal program. For example, the provision of cannabis infused oils for ingestion under the ACMPR, as a result of a court case that occurred after the completion of this study (R. v. Smith, 2015), may account for the increased registration in the legal program. Such an increase was found in the Netherlands’ medical cannabis program after the introduction of
cannabis oils (de Hoop et al., 2018), possibly resulting from patient preferences for this form of cannabis, or increased support from healthcare practitioners, who may have concerns about inhalation as a route of delivery.

Although access to the legal program confers the ability to access cannabis from legal sources, this study substantiates previous findings that many authorized patients were accessing cannabis from illegal sources (Belle-Isle et al., 2014; Government of Canada, 2017a). This suggests that access to sources is a distinct aspect of access to cannabis for medical purposes. The findings in Chapter 3 and 4 indicate that different sources of cannabis appeal to different individuals based on the suitability of products and services they provide, and suggest some potential reasons why authorized medical cannabis users may access cannabis outside of the legal framework. For example, the findings from this study provide important information about the challenges experienced by individuals accessing cannabis under the legal medical cannabis program, including cost of cannabis, finding effective strains, waiting time for registration and product, and availability of product, which may explain why some were accessing from illegal sources. Some of these problems may have been addressed under the ACMPR due to an increased number of LPs and advancements in their operations. However, many aspects of LP operations at the time of this study are still relevant to the current context. For example, the high price of many cannabis products, and the restrictive process for online purchasing and payments (i.e., payment in advance) have remained unchanged to date. One important change since the time of this study was the expansion of allowable products beyond dried cannabis, currently limited to low potency cannabis infused oils; however, other products, such as edibles and concentrates, are still not legally
accessible under the current program. Given the continuation of these problems under the ACMPR, it would not be surprising that the use of sources outside the legal program may have continued. These findings also offer valuable insights for recreational cannabis regulation, where one of the primary policy goals is to eliminate use of the illegal cannabis market. Regulations that allow the legal provision of different cannabis products (e.g., edibles and concentrates) are anticipated within the next year, and would provide an incentive for individuals to remain within the legal framework for both medical and recreational cannabis.

Other characteristics of products and services valued by those accessing cannabis outside the legal system have not been incorporated under the ACMPR, which may also have implications for continued use of illegal sources. For example, the availability of cannabis in small quantities and the ability to view and smell cannabis before making a purchase are not provided by LPs; nor is the personalized service that medical cannabis users have indicated they prefer in the current and past studies (Capler, Walsh, et al., 2017). However, these characteristics are available through illegal sources that provide in-person access, including dispensaries, which were the most widely used illegal source in the current study, as well as in past studies (Walsh et al., 2013). These findings also suggest that including legal storefront access for medical use could potentially encourage more participation in the legal medical cannabis system, which would promote communication with healthcare providers as well as allow better monitoring of cannabis use for therapeutic purposes. In contrast to the ACMPR, which does not permit such storefront access for medical cannabis, the new Cannabis Act does allow private and public retail access to be regulated by the provinces and territories for recreational cannabis use (House of Commons of
Incorporating retail sales in the recreational system will likely encourage the use of the legal market by recreational users. It could also result in the use of the recreational market by medical cannabis users by offering them another potential source of access free from the legal repercussions currently associated with access from illegal dispensaries, as discussed in Chapter 5. While the recreational market would increase patients’ autonomy by providing them access to legal sources of cannabis without having to obtain authorization from a healthcare practitioner, some medical users have emphasized the importance of differentiating their medical use from recreational use in order to reduce associated stigma (Sznitman, 2017; Williams & Chhabra, 2017). Thus, access by medical users of cannabis from legal recreational sources may create a tension between their need for reduced stigma, and their desire for increased autonomy. It is also possible that legalization of cannabis for recreational purposes will influence the trend of normalization of cannabis use in Canadian society, and with it, decrease stigma for both medical and recreational use (Duff et al., 2012; Hathaway et al., 2011). It is important to note, however, that patients’ use of the recreational cannabis system will also depend on the strains and products available, the cost, and the quality of the service.

With respect to the consequences of medical cannabis access, there is no indication that medical cannabis has become more affordable for patients under the ACMPR. It is also unclear whether the upcoming legalization of recreational cannabis will result in reduced cost. Currently, the federal government is proposing an excise tax for cannabis as part of the legalization for recreational purposes that would also apply to cannabis for medical purposes, further decreasing affordability (Department
of Finance Canada, 2017b). As seen in Chapter 5, the lack of affordability of medical cannabis can have serious health and financial consequences, similar to those reported in research examining prescription cost drugs in Canada (Law et al., 2018, 2012; Morgan & Lee, 2017). More generally, access to healthcare is one of the determinants of health, and restrictions to access due to unaffordability, inappropriateness, or other structural factors has been shown to have negative effects on individual health and well-being (Beckett, Firestone, McKnight, Smylie, & Rotondi, 2018; Canedo, Miller, Schlundt, Fadden, & Sanderson, 2018; Sommers, Maylone, Blendon, Orav, & Epstein, 2017). Research has also shown that restricted access to adequate health care, for example in relation to pain, has detrimental effects on a societal as well as personal level (Tick et al., 2018). In light of evidence that cannabis is being used by some individuals as a substitute for opioids, improved access to cannabis has the potential to alleviate the opioid epidemic being experienced in Canada and other jurisdictions (Beare Vyas et al., 2017; Lau et al., 2015; Lucas, 2017). It will be of interest to monitor how changes in the cost of cannabis, as well as increased legal access through the recreational system, may impact the opioid epidemic. Current research from Colorado, where cannabis has been regulated since 2012, has offered some provocative findings regarding the positive impact of recreational cannabis on opioid use (Corroon et al., 2017; Hill & Saxon, 2018; Livingston, Barnett, Delcher, & Wagenaar, 2017).

Overall, the findings in this study demonstrate the point made by Levesque et al. (2013), that while healthcare services may exist, access may be restricted at any stage in the process of its attainment. Access is impacted by patient-related factors (e.g., patterns of use and personal preferences for specific product and services) and
system-related factors (e.g., healthcare practitioner support and cost). The substantial health, legal, financial, and social consequences experienced by medical cannabis users in this study also underline the fact that having access to a medical cannabis program or sources does not mean that access meets patients’ needs. Finally, this study suggests there is an urgent need to define reasonable access in relation to medical cannabis from a patient-centred perspective to ensure that the degree to which it has been achieved can be evaluated and the impediments addressed. It should also be acknowledged that while reasonable access is a goal of Canada’s health care system, it has not been achieved in relation to more established areas of medicine, such as prescription drugs and dental services (Blomqvist & Woolley, 2018; Leck & Randall, 2017; Morgan & Boothe, 2016; Tang, Ghali, & Manns, 2014; Thompson, Cooney, Lawrence, Ravaghi, & Quiñonez, 2014). This exploration of reasonable access for medical cannabis may shed light on the challenges of providing access to other health care services in Canada.

6.3 Study strengths and unique contributions

This dissertation has several strengths and makes unique contributions to the literature on access to cannabis for medical purposes in Canada. First, national cross-sectional data was successfully used to produce novel evidence on associations between patient- and system factors and access to the legal program for medical cannabis, and to legal and illegal sources of cannabis in Canada. Building on previous research of medical cannabis access under the MMAR (Belle-Isle et al., 2014; Bottorff et al., 2013; Bottorff, Bissell, et al., 2011; Hathaway & Rossiter, 2007; Walsh et al., 2013), this was the first study to examine these associations after the implementation of the MMPR in 2013. This study also took advantage of the unique opportunity provided
by the co-existence of the MMAR and MMPR to compare patient- and system-related factors associated with these different regulations, as well as with access outside of the legal system. This comparison provided insight into whether the regulatory changes improved access to medical cannabis in Canada, and for whom. The unique timing also allowed the examination of access to cannabis for medical purposes at the early stages of a new set of regulations and provided a snapshot of a transitional regulatory period. This study is among the first to elucidate associations between sources of cannabis and patient- and system-related factors, providing a deeper understanding of why individuals who have access to legal sources nonetheless choose to access illegal sources. These findings provide an important contribution to the scientific literature and have direct implications for future policy and program development for both medical and recreational cannabis.

Second, this is, to our knowledge, the first study to specifically explore the consequences of accessing cannabis for medical purposes for a variety of medical conditions in Canada after the implementation of the MMPR. Chapter 5 used qualitative data to extend the concept of reasonable access beyond the quantitative examination of patient- and system-related factors associated with access to medical cannabis authorization and sources by exploring the impact of access to medical cannabis on patients’ lives. Since there has been no previous in-depth analysis of the consequences of access to medical cannabis, this topic was well-suited to an exploratory qualitative methodology. These two types of data provide complementary evidence regarding whether reasonable access had been achieved and contribute to a fuller understanding of patient experiences of access to cannabis for medical purposes. This dissertation demonstrates the value of applying a mixed
methods study design for exploring access to cannabis for medical purposes and underscores the importance of including the consequences of access in the conceptualization of reasonable access.

Third, a strength of this dissertation was the use of the Levesque patient-centred model of access to health care to inform all stages of the study. As described in Section 1.4, this model was used to gain a better understanding of the access process as it pertains to medical cannabis by differentiating between patient- and system-related factors associated with access, and identifying the stages of access where these factors may be exerting their influence. This dissertation also contributes to the broader field of access to health care by demonstrating the use of the Levesque model to explore access to cannabis for medical purposes. Although the Levesque model is presented as a linear model, Levesque et al. (2013) noted that the different stages of access may influence each other. Based on the findings in this study, this dissertation expands on the model’s conceptualization of health care access by suggesting how the stages of access may impact each other for long-term interventions, such as medical cannabis, resulting in a circular model (see Figure 6.1). For example, study participants reported their health outcomes either improving or worsening as a result of their access experience, which in turn could impact their need for medical cannabis access. If the use of cannabis and the experience of accessing it did not benefit their health at the consequences stage, a patient may decide that cannabis is not a suitable therapy for their condition or symptom, impacting the needs stage of access. Additionally, satisfaction with products and services, as well as the legal, financial, and social consequences of access, could alter a patient’s perceived need or desire for care under the program or from a specific source. For example, participants recounted
that if personal production was removed from the legal program, they would no longer desire to access cannabis under the legal program. Similarly, depending on the consequences of the access experience, the individual and their health care provider will ascertain whether the program and sources suit their respective values, which may impact the seeking stage of access. For example, some participants described concerns about their privacy and confidentiality after a reported breach by the government, which may result in them not seeking to renew their registration in the program.

6.4 Study limitations

The limitations for each analysis were described in detail in Chapters 3 to 5. These include the cross-sectional nature of the study, which does not allow for causal or temporal relationships between the explanatory and outcome variables to be made in the quantitative analyses. As such, the associations identified between patient- and system-factors and access to medical cannabis authorization and sources must be viewed with caution. Another potential limitation was the lack of verification of medical condition, authorization status and sources used by participants. In addition, the study sample was not randomly selected, and as an online survey, the sample may have been prone to self-selection; consequently, the sample may not have been representative of the population in Canada accessing cannabis for medical purposes. Self-reported data may also have been affected by various kinds of reporting biases, including social desirability and recall bias. To address these issues, the study adhered to standards for reporting Internet-based surveys (Eysenbach, 2004). In addition, because some of the activities studied were illegal, there may have been some underreporting by some individuals. However,
efforts were made to assure the confidentiality and anonymity of participants, and any personally identifiable information was removed from the data. Additionally, the study team’s past research and advocacy work gave them credibility and the survey and interview questions were designed to be non-judgmental in nature. Self-reported data used in studies on illegal drug use have been found to be valid (Darke, 1998). Together, these limitations require the associations between factors and source status and comparisons of ratings for legal and illegal sources to be interpreted with caution, pending replication from research that employs a more systematic recruitment approach, and includes physician confirmation of diagnosis and verification of authorization status and sources used.

Additionally, this study involved multiple statistical comparisons, and while many factors were found to reach statistical significance at $p < .05$ and $p < .01$, it is possible that some of these may have occurred by chance. Possible unmeasured confounding in the quantitative analysis and consequences not identified in the qualitative analysis were addressed to some extent by the involvement of community and academic experts in the development of the survey, the use of a patient-centred theoretical framework of access to health care, and the examination of factors previously found to be associated with authorization status and sources. The quantitative portion of this study focused on individuals currently using cannabis for medical purposes; future research could also explore the experiences of individuals who ceased to use cannabis for medical purposes to gain understanding of other potential barriers to access.

It is also important to note that this study took place during the early stages of MMPR. As such, there were fewer people in Canada authorized under the MMPR
relative to the MMAR, and despite support from some LPs to recruit participants, there was less representation from this group in our study; however, the numbers were sufficient for the purposes of our analysis. Additionally, at the time of this study there were only 20 LPs and they were in the early stages of launching their operations, including product development. It is, therefore, likely that some aspects of the access experience have changed since the time of the study due to an increased number of LPs and advancements in their operations. It is also important to acknowledge that the study was conducted during a period of transition between the MMAR and MMPR, and some participants may have been in transition with respect to their authorization status. This period of regulatory change thus may have created some confusion regarding which regulations the participants were reporting on. Additionally, this period of transition created ambiguity about the legal status of personal and designated production pending the court challenge. This period of uncertainty may have heightened stress experienced by some participants, and possibly increased negative perceptions of the program, or of particular regulations and sources, which may have influenced their responses. Additionally, due to the cross-sectional nature of this study, we were unable to explore how access may have changed for individuals who switched authorization groups. The problems experienced and satisfaction with products and services, as well as consequences of access, must therefore be understood in the context of the time of the study.

6.5 Recommendations

Specific recommendations resulting from each analysis are included in Chapters 3 to 5. This section considers the study as a whole and highlights key policy and program recommendations for access to cannabis for medical purposes in Canada.
that may improve health outcomes for patients, prevent threats to their liberty, and reduce negative financial and social consequences.

First, given that a goal of the medical cannabis program in Canada is to provide reasonable access, it is imperative that reasonable access be defined in order to be able to determine whether it has been achieved. The definition of reasonable access, and future evaluations of its achievement, should draw on findings from this and other studies that examine access from a patient-centred perspective. This should include factors associated with access to legal authorization and sources of cannabis, as well as consequences of access, and address barriers and facilitators at all stages of access. In developing a definition of reasonable access, the tension that exists between the limited clinical evidence and patient experiences and clinical observation must be acknowledged; additionally, an ethical balance must be struck between the need for empirical evidence and the existing reports of the potential efficacy of cannabis in relieving suffering. The definition of reasonable access thus must consider the most current clinical and empirical evidence regarding the efficacy and safety of cannabis for medical use and should be developed in consultation with patients, health care providers, and other key stakeholders in order to consider other perspectives (i.e., societal). The definition must also acknowledge that reasonable access does not guarantee that health benefits will be experienced by all those who attain it, but rather that the opportunity to realize the potential benefits exists. Based on this study, the definition of reasonable access should include the following components:

- Equitable access for all individuals with medical conditions and symptoms that could benefit from use, irrespective of their sociodemographic characteristics;
• Timely access to appropriate cannabis strains, products, and services that meet patient needs and preferences;

• Access to timely, affordable, and nonjudgmental authorization from an approved healthcare professional;

• Access to affordable products and services;

• Access that maximizes potential health benefits and minimizes negative health, legal, financial, or social consequences.

Second, to ensure better care is provided to patients, and to encourage use of only legal sources, the legal program for medical cannabis access should strive to incorporate the product and service characteristics valued by patients. For example, the availability of finished edible products could support reasonable access for those patients requiring or preferring long-acting, ingestible cannabis products, and would support compliance with provincial and territorial regulations that limit public consumption of inhaled forms of cannabis. Concerns about the potential risks from the use of edible products should be addressed by providing lower dosage portions, instructions for use, and proper labelling of products. Additionally, store-front access could address patients’ preference for personalized service, inspecting cannabis prior to making a selection, and purchasing cannabis in smaller quantities.

Third, this study highlighted the serious health and financial consequences patients experienced resulting from the lack of affordability of cannabis access. Recommendations in this regard echo those of patient groups to establish cost coverage by public and private health insurance, to remove sales and excise taxes, and
to ensure provisions for legal personal and designated production are safeguarded as an affordable source of cannabis (Canadians for Fair Access to Medical Marijuana, 2016). The financial burden and health repercussions resulting from out-of-pocket medical expenses have been acknowledged for other prescription drugs in Canada, and the federal government is currently considering the establishment of a national pharmacare program to address inequities (Government of Canada Standing Committee on Health, 2018). Given the therapeutic potential of cannabis, its low risk profile, and its potential to reduce the use of other more harmful medications, cannabis should be considered for inclusion in such a program. While LPs are incentivized to increase their customer base and market share, these for-profit entities are the only legal source of medical cannabis, and their responsibility to meet patient needs with respect to products and services provided and prices charged may need to be established through regulations.

Fourth, stigma surrounding cannabis negatively impacts the lives of medical cannabis patients and creates barriers to access. Health Canada could play an important role in addressing this stigma by acknowledging the legitimacy of cannabis as a medicine and designating it as an approved therapeutic product (Health Canada, 2016b). Such an endeavor would require academic-industry investment and collaboration to conduct the necessary research. Public education is also needed to dispel the stigma and negative stereotypes associated with cannabis use and to promote an understanding of the reasons for and methods of medical cannabis use. Public health education campaigns that are developed for recreational cannabis should focus on the benefits as well as the potential risks of cannabis use. Additionally, educational programs should be established for healthcare providers to
address knowledge gaps and increase their understanding of, and comfort with, the medical use of cannabis (Balneaves et al., 2018; Ware & Ziemianski, 2015; Ziemianski et al., 2015). Care should be taken to ensure that the Canadian Medical Association’s public calls to eliminate the medical program in light of cannabis legalization do not increase stigma for medical users by adding to the perception that the use of cannabis for medical purposes is not legitimate or worthy of medical consultation (Canadian Medical Association, 2018b).

Lastly, as Canada moves into a legalized context for the recreational use of cannabis, the needs of medical users must not be diminished. As we learned from this study, patients are vulnerable during transition periods. Although the Cannabis Act includes several exemptions for medical users regarding amounts of cannabis that can be possessed and produced, it also imposes higher criminal penalties for behaviours outside the law than currently exist under prohibition, and some fear that law enforcement could target more marginalized members of society (House of Commons of Canada, 2017a; Johnson, 2018). There is also some concern about a potential shortage of cannabis during the early stages of cannabis legalization (Arthritis Society and Canadians for Fair Access to Medical Marijuana, 2016; Zochodne, 2017); it is imperative that the supply for medical patients is prioritized. Additionally, as noted above, the Canadian Medical Association is advocating for the discontinuation of the legal program for medical cannabis following legalization. However, the unique needs of medical cannabis patients may not be addressed by a regulatory approach for recreational cannabis. For example, some of the public health goals for recreational cannabis use, such as discouraging the use of higher potency cannabis products and restrictions on amounts used and places where it can be used (Canadian Public Health
Association, 2017; Kilmer, 2018), may be counter to the goals of medical use. Any future decisions regarding the continuation of the medical cannabis program in Canada should be based on evidence that determines the extent to which a recreational market can ensure reasonable access to those using cannabis for medical purposes, including access to adequate amounts of cannabis, effective strains and products, and affordable prices, as well as appropriate consultation about safe and effective use of cannabis for patients’ medical conditions and symptoms. The review of the medical cannabis program, which is anticipated to occur five years after the implementation of the legalization of recreational cannabis, should consider the elements put forward in these recommendations. Such an evaluation exercise should also use a definition of reasonable access to medical cannabis, developed with patient and other stakeholder input, as a benchmark (Health Canada, 2018d; Task Force on Cannabis Legalization and Regulation, 2016).

6.6 Future research

This dissertation provides evidence of patient- and system- related factors associated with access to the legal medical cannabis program and to sources of cannabis in Canada, as well as consequences of the access experience on the lives of patients. Looking towards future research on medical cannabis access, a patient-centred evaluation of medical cannabis access is needed to assess the current and changing policy climate regarding medical and recreational cannabis in Canada, and to determine if there are changes to access, and the extent to which reasonable access is achieved. Future research should take advantage of existing patient-centred conceptual models of access, such as the Levesque model used in this study.
Building on the factors identified in the current and past studies, a longitudinal cohort study supplemented with qualitative research is recommended to monitor access, at regular and short-term intervals, to capture the effects of regulatory changes so that amendments can be responsive to patients’ needs. The different regulations for recreational cannabis across provincial, territorial and First Nations jurisdictions (Barrera, 2018; Fraser, 2018) will provide important opportunities to assess the impact of these differences on medical cannabis access, including the utilization of the recreational system by individuals using cannabis for medical purposes. Further, it will be important and beneficial for future research to develop standardized instruments to assess and compare outcomes across jurisdictions.

Patient-centred mixed methods research on medical cannabis access must assess access at all stages, including the impact of the access experience on patients’ health and liberty as well as the financial and social consequences. Interviews and validated quantitative instruments should be designed to assess patient- and system-related factors associated with access, including perceived quality of products and service, health outcomes, patient autonomy, legal repercussions, financial impact, and stigma. Research on access should also monitor patterns of cannabis use and how they change as new products are provided within the medical and recreational markets.

Although this study focused on medical cannabis access, it also highlights the importance of clinical research on the efficacy and safety of cannabis, including different cannabis strains and products for different medical conditions. Priority should be given to conditions for which cannabis is most commonly used, including pain, sleep and mental conditions, as well as those for which conventional medicines have been least effective (e.g., PTSD, arthritis, and Alzheimer’s). Regulations
informed by such research will ensure that patients have access to the appropriate cannabis strains, products, and information, so that they can optimally manage their symptoms and make the best treatment choices. Although cannabis has been framed as a medicine by the courts, such research is also important to garner the support of health care practitioners, and to establish eligibility for provincial insurance cost coverage. In addition, economic research looking at cost-savings from the substitution of cannabis for other prescription medication use in Canada will also support policies to address cost coverage through universal pharmacare and private health insurance (Bradford & Bradford, 2016).

6.7 Conclusion

The constitutional right to use cannabis for medical purposes in Canada was carved out of an otherwise criminalized context for the possession, production, and distribution of cannabis. A national medical cannabis program was established in Canada in 2001, regulated by the MMAR, with the aim to provide reasonable access to cannabis to those who could benefit from its therapeutic use (see Figure 1.1). However, the government did not define reasonable access, nor did the government undertake evaluations to ascertain whether that goal was met. Instead, patients sought legal recourse from the courts when their needs were not being met within the legal framework. This led to successive sets of regulations, including the MMPR in 2013 and the ACMPR in 2016. A small number of studies identified barriers to access under the MMAR, however, no studies of access had been undertaken since the implementation of the MMPR. This dissertation addresses that gap by investigating the factors associated with access to the medical cannabis program and sources in Canada, as well as the consequences of the access experience after the implementation
of the MMPR. The study findings suggest that barriers to access persisted during the time of transition between the MMAR and MMPR, both in terms of access to the program and access to legal sources, leading to serious health, legal, financial and social consequences for many patients. Given that the medical cannabis program was established to protect our constitutional rights to health and liberty, if these rights are compromised by poor quality or unaffordable products and services, access cannot be evaluated as reasonable. Overall, this study contributed unique knowledge to the field of medical cannabis access, by expanding our understanding of the factors that need to be considered in defining reasonable access and in the provision of products and services that will meet patient needs. The findings from this study also provide a foundation for future evaluations of whether reasonable access has been achieved under the current and emerging medical cannabis regulations in Canada, and to assess the impact of the upcoming legalization of cannabis for recreational purposes in Canada on individuals’ access to cannabis for medical purposes. In the current context of imminent cannabis legalization, the imperative to provide reasonable access to cannabis for medical purposes continues to be relevant, and should continue to be measured from a patient-centred perspective.
Figure 6.1 Levesque model of access to health care applied to access to medical cannabis authorization and sources
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CANARY SURVEY (BASELINE)

Section A. HEALTH AND HEALTH OUTCOMES
We would like to know about your medical conditions and symptoms, as well as medications you are taking, so that we can assess any changes over time.

A1a. Which of the following medical conditions have you been diagnosed with? (Please check ALL that apply):
   - Arthritis
   - Cancer
   - Chronic Pain (not related to arthritis, cancer, or HIV/AIDS)
   - HIV/AIDS
   - Other medical condition

A1b. Do you have any other medical conditions that have been diagnosed by a health professional? (Please check ALL that apply):
   - No other medical conditions
   - Diabetes
   - Heart disease
   - Emphysema or Chronic Obstructive Pulmonary Disease (COPD)
   - Asthma
   - Fibromyalgia
   - High blood pressure
   - Glaucoma
   - Crohn’s disease or colitis
   - Migraine headaches
Chronic bronchitis
Epilepsy
Thyroid condition
Chronic fatigue syndrome
Mood disorders (depression, bipolar disorder, mania or dysthymia)
Schizophrenia
Alzheimer's disease or other dementia
Anxiety disorder (phobia, obsessive compulsive disorder, panic disorder)
Learning disability (Attention deficit disorder (ADD), Attention deficit hyperactivity disorder (ADHD))
Eating disorder (anorexia, bulimia)
Any other long-term physical or mental condition diagnosed by a healthcare practitioner (Please specify):

A2. SDS (see attached)

A3. HAD Scale (see attached)

A4. SF12 v. 2 (see attached)

A5a. Are you CURRENTLY taking any prescription medication(s) (including pharmaceutical forms of cannabis, but excluding herbal cannabis) for your health conditions/symptoms?

Yes ____  No ____ (SKIP to A6a) /10

A5b. What prescription medication(s) have you taken for your health conditions/symptoms IN THE PAST WEEK?
Please list name of all prescription medications(s):

Med 1 ______________________
Med 2 ______________________
Med 3 ______________________
Med 4 ______________________
**A5c.** What dose do you take?
For example, 40mg three times a day

|-------|-------|-------|-------|-------|-------|-------|

**A5d.** For which of the following reasons are you taking:

Please check ALL that apply:

- Loss of appetite
- Weight loss
- Nausea
- Vomiting
- Pain relief
- Loss of sleep
- Anxiety
- Depression
- Seizures
- Inflammation
- Tumours
General well-being

Other, please specify:

A6a. Are you CURRENTLY taking any over-the-counter medications for your health conditions/symptoms?

Yes ____  No ____ (SKIP to A7a)

A6b. What over-the-counter medications have you taken for your health conditions/symptoms IN THE PAST WEEK? Please list name of over-the-counter medications below (one medication per box):

OTC 1 _____________________
OTC 2 _____________________
OTC 3 _____________________
OTC 4 _____________________
OTC 5 _____________________
OTC 6 _____________________
OTC 7 _____________________

A6c. For which of the following reasons are you taking these medications?

Please check ALL that apply

Loss of appetite
Weight loss
Nausea
Vomiting
Pain relief
Loss of sleep
Anxiety
Depression
Seizures
Inflammation

Tumours

General well-being

Other, please specify:

A7a. Are you CURRENTLY using any complementary therapies (e.g., vitamin/minerals, herbal remedies, meditation, acupuncture) for your health conditions/symptoms?

Yes ____  No ____ (SKIP to Section B1a)

A7b. What complementary therapies have you used for your health conditions/symptoms IN THE PAST WEEK?

Please select all that apply:

- Vitamin and mineral supplements (e.g., Vitamin C, D, B)
- Herbal supplements (e.g., Gingko Biloba, Echinacea)
- Other dietary supplements (e.g., Omega 3-6, Co-enzyme Q10)
- Special foods and/or diets (e.g., Green tea, mushrooms)
- Massage therapy
- Acupuncture
- Chiropractic medicine
- Naturopathic medicine
- Homeopathic medicine
- Traditional Chinese medicine
- Qi Gong
- Reiki
- Yoga
- Relaxation therapy
- Therapeutic and/or healing touch
- Meditation
- Guided imagery
- Art and/or music therapy
- Other therapy

A7c. If you used any other complementary therapies, please list below (one per box):

Comp 1 ______________________

Comp 2 ______________________
A7d. For which of the following reasons are you taking/using (name of complementary therapy from list above)?

Please check ALL that apply

<table>
<thead>
<tr>
<th>Reason</th>
</tr>
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<tbody>
<tr>
<td>Loss of appetite</td>
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</tr>
<tr>
<td>Tumours</td>
</tr>
<tr>
<td>General well-being</td>
</tr>
<tr>
<td>Other, please specify:</td>
</tr>
</tbody>
</table>

Section B. USE OF CANNABIS FOR MEDICAL PURPOSES

Please note that the following questions relate to the use of non-pharmaceutical forms of cannabis (i.e., whole plant or whole plant extracts). This information will help us understand how your access and use of cannabis has changed over time.

B1a. Have you EVER used cannabis for non-medical purposes?
Yes ____ No ____ (SKIP to B2)

B1b. When did you START using cannabis for non-medical purposes?
Please enter date (mm-yyyy): ________________

B1c. Are you CURRENTLY using cannabis for non-medical purposes?
Yes ___(SKIP to B1e) No ___
**B1d.** When did you STOP using cannabis for non-medical purposes?
Please enter date (mm-yyyy):___________________

**B1e.** How would you describe the frequency of your non-medical use of cannabis?
- a few times in your life
- a few times a year
- monthly
- weekly
- daily or almost daily

**B2.** Have you EVER used cannabis for medical purposes? (i.e., to manage symptoms related to your health condition(s) and/or related medical therapies)
- Never used (SKIP to B3a)
- Used in past, but not currently using (SKIP to B4a)
- Currently using (SKIP to B5a)

**B3a.** Please check ALL the reasons that you have NEVER USED cannabis for medical purposes:
- I have never thought about using cannabis for my health conditions and/or symptoms
- My health conditions and/or symptoms are being well managed with other medications or treatments
- I am not interested in using cannabis for my health conditions and/or symptoms
- I don’t know enough about medical cannabis
- My health care practitioner(s) do not support medical cannabis use
- My family does not support medical cannabis use
- My social network (workplace, religious community, friends) does not support medical cannabis use
- Cannabis is an illegal substance in Canada
- I am concerned about the negative side effects of medical cannabis use
- I could be discriminated against because of using medical cannabis
- I don’t know how to access medical cannabis
- I cannot afford medical cannabis
Other reason(s). Please list:_________________________________________

(SKIP to E1a)

B4a. If you have used medical cannabis in the past but are not currently doing so, when did you START using cannabis for medical purposes?
Please enter date (mm-yyyy): ___________________

B4b. When did you STOP using cannabis for medical purposes?
Please enter date (mm-yyyy): _________________

B4c. Please indicate the reasons why you STOPPED using cannabis for medical purposes:
Please select ALL that apply:

My symptoms improved and I don't need medical cannabis at this time
I currently use pharmaceutical medication for my health conditions and/or symptom(s)
I currently use an over-the-counter medication for my health conditions and/or symptom(s)
I currently use a complementary or alternative therapy for my health conditions and/or symptom(s)
Medical cannabis does not relieve my health condition/symptoms
My health conditions/symptoms get worse after using medical cannabis
I do not like the side effects of medical cannabis
I find accessing medical cannabis too risky
I cannot afford to pay for medical cannabis at this time
I cannot obtain the medical cannabis strains or products I need at this time
My family does not support medical cannabis use
My social network (workplace, religious community, friends) does not support medical cannabis use
I was discriminated against because of using medical cannabis
My health care provider(s) do not support medical cannabis use
Other reasons. Please specify: _____________________________________

(SKIP to C1a)
**B5a.** When did you START using cannabis for medical purposes?

Please enter date (mm-yyyy): ___________________

(SKIP to **C1b**)

**Section C. REASONS FOR USE OF CANNABIS FOR MEDICAL PURPOSES**

Please note that the following questions relate to the use of non-pharmaceutical cannabis (i.e. whole plant or whole plant extracts).

**C1a.** What were your reasons for using medical cannabis?

Please check ALL the reasons that apply

<table>
<thead>
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</tr>
<tr>
<td>Seizures</td>
<td>Inflammation</td>
</tr>
<tr>
<td>Tumours</td>
<td>General well-being</td>
</tr>
<tr>
<td>Other reason(s)</td>
<td></td>
</tr>
</tbody>
</table>

If you used cannabis for other reasons, please list below:

Reason 1. 
______________________
Reason 2. 
______________________
Reason 3. 
______________________
How effective was medical cannabis for the purpose(s) you listed?
Not at all Effective
A little bit Effective
Somewhat Effective
Quite a bit Effective
Very Effective

(SKIP to E2a)

C1b. What are your reasons for using medical cannabis?:

Please check ALL the reasons that apply

<table>
<thead>
<tr>
<th>Loss of appetite</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Nausea</td>
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<td>Seizures</td>
<td>Inflammation</td>
</tr>
<tr>
<td>Tumours</td>
<td>General well-being</td>
</tr>
</tbody>
</table>

Other reason(s)

If you use cannabis for other reasons, please list below:

Reason 1.

Reason 2.

Reason 3.
How effective is medical cannabis for the purpose(s) you listed?

Not at all Effective
A little bit Effective
Somewhat Effective
Quite a bit Effective
Very Effective

Section D. PATTERNS OF USE OF CANNABIS FOR MEDICAL PURPOSES
Please note that the following questions relate to the use of non-pharmaceutical cannabis (i.e. whole plant or whole plant extracts).

D1. Which response best describes how often you CURRENTLY use cannabis for medical purposes?

Less than one time per month
1-2 times per month
1-2 times per week
3-5 times per week
Once per day
More than once a day

D2. Please indicate how much cannabis you use for medical purposes for EACH of the time frames below. If not applicable please enter N/A:
Note: the typical weight of average joint = 0.3-0.5 grams; an eighth = 3.5 grams; a quarter = 7 grams; 1 oz. = 28 grams

a. per session of use (grams): ______
b. per day (grams): _______
c. per week (grams): ______
d. per month (grams): ______

D3. Please indicate how you use cannabis for medical purposes.
Select ALL that apply:

Inhaled – Smoked herbal cannabis
Inhaled – Vaporized herbal cannabis
Inhaled – Concentrates (oil, resin, hash)
Ingested – Edibles such as baked goods, capsules, beverages
Ingested – Juiced
Ingested – Concentrates (oil, resin, hash)
Tinctures (spray or drops)
Topical (ointment, cream or salve on skin)

Other method(s). Please specify: ________________________

(SKIP to E3a)

Section E. HEALTH CANADA’S MEDICAL CANNABIS PROGRAM

Note: Health Canada’s medical cannabis program began providing authorizations to possess and produce cannabis under the Marihuana Medical Access Regulations (MMAR) in 2001. Starting in October 2013, medical documents can be obtained from a physician or nurse practitioner to allow a supply of cannabis to be purchased from a licensed producer under the Marihuana for Medical Purposes Regulations (MMPR).

E1a. Do you PLAN TO use cannabis for medical purposes under Health Canada’s medical cannabis program in the future?

Yes
No  (SKIP to E1c)

E1b. If you plan to use cannabis for medical purposes under Health Canada’s medical cannabis program in the future, what are the REASONS?

Please select ALL the reasons that apply:

- I want to get medical cannabis through a legal program
- Getting medical cannabis through the program will reduce stigma
- Getting medical cannabis through the program will be convenient
- The program will have more variety of licensed producers to choose from
- The program will provide a high quality of medical cannabis
- I do not have access to any other sources of medical cannabis
- My health care provider will support me getting medical cannabis through the program
- My family and social network will support me getting medical cannabis through the program
- Other reason(s). Please specify: ________________________________

(SKIP to Section G)

E1c. If you do not plan to use cannabis for medical purposes under Health Canada’s medical cannabis program in the future, what are the REASONS? Please check ALL the reasons that apply:
I do not plan to use cannabis for medical reasons
I do not know about the program
I do not feel comfortable talking to my doctor/nurse practitioner about medical cannabis
My doctor/nurse practitioner will not provide the necessary medical document
I will not be able to produce my own medical cannabis under the program
I will not be able to have a designated grower produce my medical cannabis under the program
It will be too expensive under the program
It is easier to get medical cannabis in other ways
I have other sources that I prefer
I am concerned about my privacy
Other reason(s). Please specify: ________________________________

(SKIP to Section G)

E2a. When you used cannabis for medical purposes in the past, were you using it under Health Canada’s medical cannabis program?

Yes, under the MMAR (SKIP to E2c)
Yes, under the MMPR (SKIP to E2c)
No

E2b. If you did not use cannabis for medical purposes under Health Canada’s medical cannabis program, what were the REASONS?
Please select ALL the reasons that apply:
I did not know about the program
I did not feel comfortable talking to my doctor/nurse practitioner about medical cannabis
My doctor/nurse practitioner did not provide the necessary medical document
It was too expensive under the program
It was easier to get medical cannabis in other ways
I had other sources that I preferred
I was concerned about my privacy
Other reason(s). Please specify: ________________________________
**E2c.** Do you **PLAN TO** use cannabis for medical purposes under Health Canada’s medical cannabis program in the future?

Yes  
No (skip to **E2e**)  

**E2d.** If you **plan to** use cannabis for medical purposes under Health Canada’s medical cannabis program in the future, what are the **REASONS**?

Please select ALL the reasons that apply:

- I want to get medical cannabis through a legal program  
- Getting medical cannabis through the program will reduce stigma  
- Getting medical cannabis through the program will be convenient  
- The program will have more variety of licensed producers to choose from  
- The program will provide a high quality of medical cannabis  
- I do not have access to any other sources of medical cannabis  
- My health care provider supports me getting medical cannabis through the program  
- My family and social network supports me getting medical cannabis through the program  
- Other reason(s). Please specify: ___________________________________  

(SKIP to **F1a**)  

**E2e.** If you **do not plan** to use cannabis for medical purposes under Health Canada’s medical cannabis program in the future, what are the **REASONS**? Please check ALL the reasons that apply:

- I will not need cannabis for medical reasons  
- My doctor/nurse practitioner will not provide the necessary medical document  
- I will not be able to produce my own medical cannabis under the program  
- I will not be able to have a designated grower produce my medical cannabis under the program  
- It will be too expensive under the program  
- It is easier to get medical cannabis in other ways  
- I have other sources that I prefer  
- I am concerned about my privacy  
- Other reason(s). Please specify: ___________________________________  

(SKIP to **F1a**)
E3a. If you are CURRENTLY using cannabis for medical purposes, are you using it under Health Canada’s medical cannabis program?

Yes, under the MMAR (SKIP to E3d)

Yes, under the MMPR

No (SKIP to E3c)

E3b. If you are currently using cannabis under the MMPR, were you previously authorized under the MMAR?

Yes (SKIP to E3d)

No (SKIP to E3d)

E3c. If you do not currently use cannabis for medical purposes under Health Canada’s medical cannabis program, what are the REASONS?

Please select ALL reasons that apply:

I did not know about the program

I do not feel comfortable talking to my doctor/nurse practitioner about medical cannabis

My doctor/nurse practitioner will not provide the necessary medical document

It is too expensive under the program

It is easier to get medical cannabis in other ways

I have other sources that I prefer

I am concerned about my privacy

Other reason(s). Please specify: ________________________________

E3d. Do you PLAN TO use cannabis for medical purposes under Health Canada’s medical cannabis program in the future?

Yes

No (SKIP to E3f) 38

E3e. If you plan to use cannabis for medical purposes under Health Canada’s medical cannabis program in the future, what are the REASONS?

Please select ALL the reasons that apply:

I want to get medical cannabis through a legal program
Getting medical cannabis through the program will reduce stigma
Getting medical cannabis through the program will be convenient
The program will have more variety of licensed producers to choose from
The program will provide a high quality of medical cannabis
I do not have access to any other sources of medical cannabis
My health care provider supports me getting medical cannabis through the program
My family and social network supports me getting medical cannabis through the program
Other reason(s). Please specify: ________________________________
(SKIP to F1b)

E3f. If you do not plan to use cannabis for medical purposes under Health Canada’s medical cannabis program in the future, what are the REASONS? Please check ALL the reasons that apply:

I will not need cannabis for medical reasons
My doctor/nurse practitioner will not provide the necessary medical document
I will not be able to produce my own medical cannabis under the program
I will not be able to have a designated grower produce my medical cannabis under the program
It will be too expensive under the program
It is easier to get medical cannabis in other ways
I have other sources that I prefer
I am concerned about my privacy
Other reason(s). Please specify: ________________________________
(SKIP to F1b)

Section F. MEDICAL CANNABIS ACCESS AND SATISFACTION

F1a. Please indicate your PAST source(s) of medical cannabis. Select ALL that apply:

Health Canada supplier – Prairie Plant Systems (MMAR)
Designated producer (MMAR)
Personal production (MMAR)
Licensed producer (MMPR)
Medical cannabis dispensary/Compassion club
Self-produce (no license)
Close friend/family
Acquaintance/"Dealer"
Unfamiliar street source

(SKIP to F11)

F1b. Please indicate your CURRENT source(s) of medical cannabis. Select ALL that apply:

Health Canada supplier – Prairie Plant Systems (MMAR)
Designated producer (MMAR)
Personal production (MMAR)
Licensed producer (MMPR)
Medical cannabis dispensary/Compassion club
Self-produce (no license)
Close friend/family
Acquaintance/"Dealer"
Unfamiliar street source

F2. How would you rate the medical cannabis products from the following source(s)? Please answer for each source below:

How would you rate the medical cannabis products?

Very Poor; Poor; Fair; Good; Very Good

<table>
<thead>
<tr>
<th>Overall satisfaction</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Humidity (amount of moisture)</td>
<td></td>
</tr>
<tr>
<td>Appearance</td>
<td></td>
</tr>
<tr>
<td>Grind size</td>
<td></td>
</tr>
<tr>
<td>THC content (potency)</td>
<td></td>
</tr>
<tr>
<td>Selection of strains</td>
<td></td>
</tr>
<tr>
<td>Availability of preferred strains</td>
<td></td>
</tr>
<tr>
<td>Availability of cannabis products (edibles, tinctures, etc.)</td>
<td></td>
</tr>
<tr>
<td>Effectiveness at relieving my symptoms</td>
<td></td>
</tr>
</tbody>
</table>
F3. To what extent do you agree or disagree with the following statements about the quality of care and service provided by the following source(s) of medical cannabis? Please answer for each source below:

To what extent do you agree or disagree with the following statements about the quality of care and service?

**Strongly disagree; Disagree; Neither agree nor disagree; Agree; Strongly agree; Not applicable**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>They always listen to what I have to say</td>
<td></td>
</tr>
<tr>
<td>They understand my needs</td>
<td></td>
</tr>
<tr>
<td>There are opportunities for me to provide feedback to them</td>
<td></td>
</tr>
<tr>
<td>I find it easy to talk with them</td>
<td></td>
</tr>
<tr>
<td>They answer my questions</td>
<td></td>
</tr>
<tr>
<td>They explain things in a way that I can understand</td>
<td></td>
</tr>
<tr>
<td>I believe they care about me</td>
<td></td>
</tr>
<tr>
<td>I talk with them about things that are happening in my life, not just about my medical condition or cannabis products</td>
<td></td>
</tr>
<tr>
<td>I get personalized attention from them</td>
<td></td>
</tr>
<tr>
<td>I have built a good relationship with them</td>
<td></td>
</tr>
</tbody>
</table>

F4. To what extent do you agree or disagree with the following statements about the expertise and support provided by the following source(s) of medical cannabis? Please answer for each source below:

To what extent do you agree or disagree with the following statements about the expertise and support?

**Strongly disagree; Disagree; Neither agree nor disagree; Agree; Strongly agree; Not applicable**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can rely on them to be well trained and qualified</td>
<td></td>
</tr>
<tr>
<td>They carry out their tasks competently</td>
<td></td>
</tr>
<tr>
<td>They provide thorough explanations about the medicine and different ways to take it</td>
<td></td>
</tr>
</tbody>
</table>
They make good recommendations for strains and products most appropriate for my particular condition and symptoms.

They help me to keep track of the cannabis strains and products I have used.

They support me to meet my needs around medical cannabis.

They support me to access other health care services and community resources.

They maintain a positive presence and good relations with the community.

F5. To what extent do you agree or disagree with the following statements about the administrative quality, affordability and accessibility at the following source(s) of medical cannabis?

Please answer for each source below:

To what extent do you agree or disagree with the following statements about the administrative quality, affordability and accessibility?

Strongly agree; Agree; Neutral; Disagree; Strongly disagree; Not applicable

I receive medical cannabis in a timely manner

Generally, appointments run on time

They have responded to my calls or other inquiries in a timely manner

The registration procedures are timely

The records and documentation are accurate

I believe it is well-managed

The hours of operation meet my needs

The location is convenient

The options for accessing medical cannabis meet my needs (i.e. mail, in-person)

I feel safe getting cannabis through this source

The cannabis and associated costs are affordable

F6. How would you rate your overall satisfaction with the following source(s)? Please
answer for each source below:

**Completely unsatisfied; Somewhat unsatisfied; Neutral; Somewhat satisfied; Completely satisfied**

F7. How much money do you spend on average **PER MONTH** on medical cannabis (including product, supplies, mailing, and production cost)?
Please fill in $ **per month** for each source below:

<table>
<thead>
<tr>
<th>source</th>
<th>$ per month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Canada Supplier – PPS (MMAR)</td>
<td></td>
</tr>
<tr>
<td>Personal Production - PPL (MMAR)</td>
<td></td>
</tr>
<tr>
<td>Designated Producer – (MMAR)</td>
<td></td>
</tr>
<tr>
<td>Health Canada Licensed Producer (MMPR)</td>
<td></td>
</tr>
<tr>
<td>Medical Cannabis Dispensary</td>
<td></td>
</tr>
<tr>
<td>Self-produce – (no license)</td>
<td></td>
</tr>
<tr>
<td>Close friend/family</td>
<td></td>
</tr>
<tr>
<td>Acquaintance/Dealer</td>
<td></td>
</tr>
<tr>
<td>Unfamiliar Street Source</td>
<td></td>
</tr>
</tbody>
</table>

F8. What quantities do you purchase from the following sources?
Please fill in **grams/month** for each source below:

<table>
<thead>
<tr>
<th>source</th>
<th>grams/month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Canada Supplier – PPS (MMAR)</td>
<td></td>
</tr>
<tr>
<td>Personal Production - PPL (MMAR)</td>
<td></td>
</tr>
<tr>
<td>Designated Producer – (MMAR)</td>
<td></td>
</tr>
<tr>
<td>Health Canada Licensed Producer (MMPR)</td>
<td></td>
</tr>
<tr>
<td>Medical Cannabis Dispensary</td>
<td></td>
</tr>
<tr>
<td>Self-produce – (no license)</td>
<td></td>
</tr>
<tr>
<td>Close friend/family</td>
<td></td>
</tr>
<tr>
<td>Acquaintance/Dealer</td>
<td></td>
</tr>
<tr>
<td>Unfamiliar Street Source</td>
<td></td>
</tr>
</tbody>
</table>

F9. On average, how long does it take for you to receive medical cannabis from the following source(s) after you have placed your order?

Please select from menu for each source below:

1-2 days
3-4 days
5-7 days
8-10 days
11-13 days
2-3 weeks
1 month
longer than one months

**F10.** How long did it take for your initial application to be approved by the following source(s)?
Please select from menu for each source below:

<table>
<thead>
<tr>
<th></th>
<th>Health Canada (MMAR)</th>
<th>Health Canada Licensed Producer (MMPR)</th>
<th>Medical Cannabis Dispensary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 week</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-3 weeks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 month</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-3 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-6 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>longer than 6 months</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**F11.** have you ever had an application rejected from the following source(s)? Please answer for each source below:
F12. Have you EVER experienced any of the following problems in getting medical cannabis?
Please select ALL that apply:

- Getting documentation from health care provider
- Cost of documentation from health care provider
- Cost of medical cannabis (including shipping)
- Cost of production supplies
- Finding cannabis strains/products effective for my health condition/symptoms
- Availability of medical cannabis
- Waiting time for registration (with licensed producer or medical cannabis dispensary)
- Waiting time to receive product (e.g. in mail)
- Didn’t have enough information about where to access medical cannabis
- Family/friends objection
- Problems with law enforcement
- Other problem(s). Please specify: _________________
- Have not experienced any problems

F13. From what source(s) you would you PREFER to get cannabis for your medical use?
Please select ALL that apply:
Health Canada supplier – Prairie Plant Systems (MMAR)
Designated producer (MMAR)
Personal production (MMAR)
Licensed producer (MMPR)
Medical cannabis dispensary/Compassion club
Self-produce (no license)
Close Friend/family
Acquaintance/"Dealer”
Unfamiliar “street” source

F14. Which of the following characteristics of medical cannabis products or services are IMPORTANT to you?
Please select ALL that apply:

Access to my preferred medical cannabis strain(s)
Access to a variety of medical cannabis strains
Access to variety of medical cannabis products such as baked goods, tinctures, oils, hashish, etc.
Organically grown
Standardized levels of the active ingredients (i.e., THC, CBD, other cannabinoids, terpenoids)
Certified to be free of pesticides and fertilizers
Certified to be free of microbial contaminants (e.g., fungus, bacteria)
Provided in trimmed ‘bud’ form
Provided in milled (ground or powdered) form
Sent to my home
Available in a store-like facility/medical cannabis dispensary
Available in a pharmacy
Able to observe and smell the cannabis before I purchase
Able to select strain and dosage
Available in small quantities
Available in large quantities
Other characteristic(s). Please specify: __________________________
Section G. INTERACTIONS WITH HEALTHCARE PROVIDERS

G1a. Have you had a conversation with your health care provider(s) about your use of cannabis for medical purposes?

_ Yes, I raised the issue
_ Yes, my health care provider raised the issue
_ No (SKIP to Section H)

G1b. Which health care provider(s) have you spoken with about your medical use of cannabis?

Please select ALL that apply:

- Medical doctor (General practitioner/family doctor)
- Medical doctor (Specialist)
- Nurse practitioner/Nurse
- Other healthcare provider(s)

If you have spoken with other health care providers about your medical use of cannabis please list below:

Provider 1 _______________________
Provider 2 _______________________
Provider 3 _______________________

G1c. How satisfied were you with your communications with your health care provider(s) regarding your use of cannabis for medical purposes? Please select from the drop down menu for each of the health care provider below:

Completely unsatisfied; Somewhat unsatisfied; Neutral ; Somewhat satisfied; Completely satisfied

<table>
<thead>
<tr>
<th>Medical Doctor (family doctor/general practitioner)</th>
<th>Medical Doctor (Specialist)</th>
<th>Nurse practitioner/Nurse</th>
<th>Other healthcare provider</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**G1d.** Please indicate if the health care provider(s) you spoke with about the use of medical cannabis did the following **actions**.

Please select from the drop down menu for each health care provider below:

<table>
<thead>
<tr>
<th><strong>Yes</strong></th>
<th><strong>No</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Informed you about options for accessing cannabis</td>
<td></td>
</tr>
<tr>
<td>Recommended you access cannabis to treat your health condition or relieve your symptoms</td>
<td></td>
</tr>
<tr>
<td>Provided you with documentation for accessing cannabis for medical purposes</td>
<td></td>
</tr>
</tbody>
</table>

**G2a.** If you CURRENTLY access cannabis for medical purposes under Health Canada’s program (MMAR or MMPR), which health professional(s) provided you with the required medical documents?

Please select **ALL** that apply:
- Medical doctor (General practitioner/family doctor)
- Medical doctor (Specialist)
- Nurse practitioner

**G2b.** How did you obtain documentation to access Health Canada’s program?

- My regular health care provider provided documentation
- My regular health care provider provided a referral to another doctor/specialist/nurse practitioner that provided documentation
- I had to find a health care provider specifically for this purpose

**G2c.** How many **grams per day** of medical cannabis did your health care provider authorize you to use through Health Canada’s program?

Please specify number of grams/day: ______

**G2d.** Was the amount of cannabis you were authorized to use by your health care provider **enough** to meet your needs?

- Yes
- No

**G2e.** Were you **charged** to have your medical documentation completed to access medical cannabis through Health Canada’s program?
Yes
No (SKIP to **G2g**)

**G2f.** How much were you charged for medical documentation for Health Canada’s program?
Please specify dollar amount charged:

$ _________

**G2g.** In general, how difficult was it to obtain a medical document to access cannabis for medical purposes under Health Canada’s program?

___ Very difficult ___ Difficult ___ Neutral ___ Easy ____ Very Easy

**Section H. KNOWLEDGE**

**H1.** Were you aware of Health Canada’s medical cannabis program before doing this survey?

Yes
No (SKIP to **H3**)

**H2.** Are you aware of upcoming regulatory changes to Health Canada’s medical cannabis program?

Yes
No

**H3.** How would you rate your level of knowledge about the following aspects of medical use of cannabis?

___ Very Poor ___ Poor ___ Fair ___ Good ___ Very Good

a. The potential harms of using medical cannabis

b. The potential therapeutic benefits of using medical cannabis

c. The different methods of using medical cannabis (i.e., smoking, vaporization, tinctures)

d. The differences between strains of medical cannabis (i.e., potency and effects of different strains)
e. How cannabis works in the human body (i.e., cannabinoids and the endocannabinoid system)

f. How to take the right dose of medical cannabis (i.e., self-titration)

g. The side-effects of medical cannabis

h. How to reduce the side-effects of taking medical cannabis (i.e., harm reduction)

i. Possible interactions between medical cannabis and other pharmaceutical and over-the-counter medication

j. How to access medical cannabis in Canada

k. The legal status of medical cannabis in Canada

H4. Is there anything you would like more information about? Please list below:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Section I. HEALTH CARE UTILIZATION

I1a. In the past 3 MONTHS, have you been a patient overnight in a hospital, nursing home or convalescent home?

   Yes
   No (SKIP to I2)

I1b. If you have been a patient overnight in a hospital, nursing home or convalescent home in the past 3 MONTHS, how many nights did you spend? Please specify number of nights: ______________

I2. In the past 3 MONTHS, have you received any health care services at a hospital, for any diagnostic or day surgery service, or as an emergency room patient?

   Yes
   No
I3. In the past 3 MONTHS, not counting hospital visits, have you received any health care services from a family doctor or other physician, or nurse practitioner?

   Yes
   No

I4. In the past 3 MONTHS, have you received any community-based care? (home care, home-based counselling or therapy, personal care and community walk-in clinics)

   Yes
   No

I5. In the past 3 MONTHS, have you used a telephone health line or telehealth service?

   Yes
   No

I6. In the past 3 MONTHS, how many times have you seen, or talked on the telephone, about your physical, emotional or mental health with a health care professional (physician, nurse practitioner, etc.)

   Number of times:______

J. DEMOGRAPHICS

J1. What is your gender?

   Male
   Female
   Transgendered/Other

J2. What is your year of birth? _________________________

J3. What is your marital status?

   Married/Common-law
   Single (never married)
   Separated/Divorced
   Widowed

J4. Which of the following best describes your background?

   Please select ALL that apply:

   Caucasian (White)
Hispanic (e.g., Mexican, Central American, South American)
Asian (e.g., Chinese, Japanese, Korean)
South Asian (e.g., East Indian, Pakistani, Sri Lankan)
Black (e.g., African, Caribbean)
Middle Eastern (e.g., Lebanese, Iranian, Afghani, Arabic, Egyptian)
First Nation
Métis
Inuit
Other. Please specify: ___________________

J5. What language(s) do you speak at home?
Please select ALL that apply:

   English
   French
   Other, please list: _______________________________

J6. Where do you live?
Province/Territory of residence: ___________________
City/town/village: ______________
Postal Code: ___________________

J9. Is your primary residence (i.e., home) in a:

   Rural or remote area
   Suburban area
   Urban area

J10. What is the highest level of education that you have completed?

   Elementary school (grade school)
   Secondary school (high school)
   Technical and non-university education (college; CEGEP)
   University, undergraduate (bachelor’s degree)
   University, graduate school (master’s degree; doctorate degree; post-doctorate degree)

J11. What is your yearly household income?

   _ less than $20,000
   _ $20,000 - $39,999
   _ $40,000 - $59,999
   _ $60,000 - $79,999
   _ $80,000 - $99,999
   _ $100,000- $119,999
more than $120,000

**J12.** How would you describe your employment?
Please select ALL that apply:

- Full Time
- Part-Time
- Casual/Seasonal
- Self-employed
- Unemployed
- Retired
- On disability
- Student
APPENDIX B: CANARY INTERVIEW GUIDE

CANARY INTERVIEW GUIDE

A. Story of cannabis use:

1. Please tell me about your experience using cannabis (pot, weed, marijuana) in the past.
2. Now let’s focus on your medical use of cannabis:
   a. When did you first hear about using cannabis for medical reasons?
   b. How long ago did you start using cannabis for your health issues? What were you using before to manage your health issues? Concurrently?
   c. Why did you decide to use cannabis for your health issues?
   d. In your own words, what does cannabis do as a medicine?
   e. How do you use cannabis? (Probe: in what forms?)

B. Time line of sources

3. I’m interested in the timeline of how you have accessed cannabis for medical use.
   a. When did you first access cannabis for medical reasons?
   b. From where did you first access cannabis for medical reasons?
   c. Where next did you access cannabis for medical reasons/when?
   d. If you stopped using cannabis at any point, why did you do so? Why did you start again?

4. For each source in order:
   a. Where did you hear about this source?
   b. Why did you choose to go there?
   c. How did you get in (access to this source)?
   d. What were the barriers to accessing it from that source, if any?
   e. What facilitated access to that source, if anything?
   f. Can you tell me about first time you got it from that source? What was that experience like?
   g. What products and services were provided at that source?
   h. What was/is your experience like there overall? Probe: What worked well? What didn’t? (Probe: what were/are your concerns? What did/do you think was good about that source)
   i. How happy were/are you with that source?
   j. Why did you go to another source?

C. Health Canada Programs
5. Let’s switch gears to Health Canada’s programs for medical cannabis. What do you know about Health Canada’s program? (Probe: The MMAR? The MMPR? In your own words, how does an individual access cannabis through Health Canada’s program?)

6. [If NOT using MMAR/MMPR] - Why did you not use Health Canada’s programs to gain access to cannabis? (Probe: What were your concerns? What do you think is good about the program?)

7. Do you have any intention in the future of being part of the Health Canada program in the future? Why/Why not? (Probe: what motivates you to join? What makes you wary of joining? Under what circumstances would you consider taking part?)

8. Now let’s focus on the MMPR (the new program). Please answer to the best of your ability, drawing from your own experience and/or opinions, or from others you know:
   a. In these regulations, the only legal source through companies licensed by government for profit - how do you feel about that? Probe: What’s good? bad? What does/would it mean for you regarding using and accessing cannabis? Who do you think should be able to supply cannabis to patients?
   b. New regulations do not allow personal production of cannabis - how do you feel about that? Probe: What’s good? bad? What does /would that mean for you? Who do you think should be able to produce cannabis?
   c. The new program requires prescription/medical documents to access the cannabis must come from a physician or nurse practitioner –how do you feel about that? Probe: What’s good? bad? What does/would it mean for you? Which other health professionals if any should be able to prescribe?
   d. New program has quality control measures for cannabis production, packaging, labeling, storage and testing (e.g. follow food and drug act for herbal medicines re, microbial and chemical contaminants, testing using validated methods for contaminants and % thc/cbd, pest control must be registered under pest control product act, sanitary conditions for production, packaging, labeling and storage)- how do you feel about that? Probe: What’s good? bad? What kind of quality control measures do you feel are important for cannabis for medical reasons? How important is packaging
   e. New regulations allow commercial producers to provide dried cannabis only. There will be many different strains available but no baked goods, tinctures, concentrates or other products - how do you feel about that? Probe: What’s good? bad? What does/would that mean for you (Probe: how will it affect your supply)? What kind of products do you think are important?
   f. New program allows patients to order or have on hand 150 grams- how do you feel about that? Probe: What’s good? bad? What does/would that mean for you? What amount do you think is reasonable?
   g. The cost of cannabis in the new program is determined by the free market and is expected to be higher than under the MMAR - how do you feel about that? Probe: What’s good? bad? What does/would this mean for you? How affordable is cannabis for you now? How do you think the regulation changes will affect the affordability of cannabis for medical purposes? What do you think the price
should be? What would the price have to be for you to be able to afford what you need?
h. There will be many new licensed suppliers under the new program. If you plan to participate in it, how will you decide which supplier you will purchase from? (Probe: What would you be looking for? What characteristics are important in selecting a supplier?)
i. Licensed producers must supply through the mail – what do you think about that? Does that work for you?
j. What are you doing to prepare for the new regulations to ensure you will be able to get/afford the products you require? Probe: If you were licensed to produce your own or have a designated grower, will you continue with that supply? If the injunction ends, what will you do? If this was the only way to get it, what would you do?
k. Overall, do you think the only legal route will work for you? Why/why not? How hopeful are you?
l. How much choice/control do feel you have related to cannabis for medical purposes? More or less because of new regs

9. What has been the impact of the existence of the Health Canada program on your access to cannabis?
10. How has the program changed your health or use of health care services?

D. Ideal access

11. If you could create the ideal medical marijuana program, what would it look like? Probe: How would you ideally want to get it? What is perfect system?

E. Information

12. What kind of information about cannabis use did you get from the sources you got it from? What education do you think patients need? Probe: What type of information should be provided with cannabis? What other information would you have liked to receive? Ideally, where/who would you like to get this information from?
13. Some patients tell us they learn a lot on their own – by reading, talking to other people, on internet, and trial and error figuring out what works for them – and are actively involved in their own health care. What has that journey been like for you with cannabis? What’s good about that? What’s bad? How does this level of involvement compare to other medicine? How do you feel about that level of involvement?

14. Community

E. Stigma

15. Historically, doctor organizations haven’t been very supportive of the MMAR program, and seem to also support the MMPR. What was your personal experience talking to
doctors or other HCPs about medical cannabis? Probe: How have your conversations about cannabis affected your relationship with your doctor/health care team? How did you find a doctor to talk to about cannabis? Did you have to pay for service? How do you think the new program will/can impact their reaction to cannabis for medical purposes?

16. We have heard from patients that they have encountered people with negative opinions and biases against cannabis for medical use. What has your experience been? Probe: How do people in your life feel about cannabis and your use of it? Do you think the new regulations about cannabis and its commercialization will change that? Why/why not? What would be needed to change public opinion?

17. Do you have anything else you’d like to share about your experience of using cannabis for medical reasons?

18. Do have anything else you’d like to share about you thought on how the new regulations will impact access to cannabis for medical purposes?