

Cannabis Use in Menopause: A Mixed Methods Research Study Capturing the Experiences and  
Perspectives of Women

by

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## **ABSTRACT**

Menopause not only marks the end of a woman's reproductive years but is a significant transition from a biological and psychosocial standpoint. The majority of women will experience menopause symptoms including vasomotor symptoms, genitourinary symptoms, sleep disturbances, mood changes, depression, anxiety, muscle or joint pain, weight gain and decreased libido. There are many approaches women may take in managing these symptoms involving a combination of prescription medications, complementary and alternative medicines, or lifestyle changes. Since the legalization of cannabis in Canada, the use of cannabis for medical and recreational purposes has increased, especially within the midlife population. There is growing interest in using cannabis for symptoms that overlap with menopause. Following a two-phase, mixed methods research design, the purpose of this thesis was to explore the experiences and perspectives of midlife women using cannabis for medical purposes coinciding with menopause symptoms.

The first project of this thesis was the quantitative phase of the mixed methods research. A cross-sectional, web-based survey in midlife women living in Alberta was completed to characterize cannabis use patterns and perceptions, as well as their menopause stage and symptoms. These findings showed over one-third (34%) of midlife women surveyed were current users of cannabis, and 65% indicated ever using cannabis. Of the current users, 75% of these women are using for medical purposes, with the most common reasons that overlapped with menopause being sleep issues, anxiety, muscle/joint aches, irritability, and depression. Most women accessed cannabis from non-medical sources and used an assortment of cannabis forms at varying frequencies of use. In addition, current cannabis users were more likely to report experiencing menopause symptoms as compared to non-users. History of smoking and

health status were significant independent predictors of current cannabis use. Women commonly used the internet or their family or friends for information on cannabis, but desired to get information from healthcare providers.

The second project of this thesis was the qualitative phase of the mixed methods research aimed to explore the experiences and perceptions of midlife women using cannabis for medical purposes. Women were recruited from the initial survey sample to take part in one-on-one interviews. Menopause was described as a unique, complex experience and cannabis was a therapeutic agent that provided symptom relief and maintained their quality of life. Women self-managed their use of cannabis, accessed cannabis from a variety of medical and non-medical sources, and relied on experimentation. Similarities in a lack of information available, limited role of healthcare providers, feelings of stigmatization and emphasis on self-educating were reported in women's experiences with menopause and with using cannabis for medical purposes.

The findings from this thesis established that midlife women are using cannabis to manage their symptoms coinciding with menopause. Future research is required to better understand the effect cannabis has on menopause symptoms and aid in the development of clinical resources and education to support midlife women in managing their symptoms with cannabis. By going directly to women, this thesis highlighted the opportunities healthcare providers have to improve the care of midlife women during menopause.

## **PREFACE**

This thesis is an original work by Katherine Anna Babyn. The mixed methods research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, “Cannabis Use in Menopause: Capturing the Experiences and Perspectives of Women”, Pro00100591, October 6, 2020.

Chapter 2 of this research project contained a pilot study of the survey questionnaire developed. The pilot study received ethics approval from the University of Alberta Research Ethics Board, “Cannabis Use in Menopause: Survey Pilot Study”, Pro00100595, June 22, 2020.

## **DEDICATION**

This work is dedicated to:

*My family* – who encourage me with all the love and support to pursue my goals

*And to the women involved in this research* – who shared their life experiences and gave me opportunities to learn and grow into a better person and healthcare professional

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## **CHAPTER 1. OVERVIEW**

### **1.1 INTRODUCTION**

#### **1.1.1 Menopause**

Menopause marks the end of a woman's reproductive years with the cessation of the menstrual cycle. Natural menopause is defined as a 12-month period of amenorrhea and without any underlying surgical or medical cause.<sup>1,2</sup> Perimenopause is a transitional period prior to the last menstrual period marked by menopause symptoms, with or without menstrual cycle irregularities. There are many factors that have been identified that can influence age of menopause onset or the presence of menopausal symptoms, including smoking status, ethnicity, education level, presence of other comorbidities (such as heart disease), parity, and use of hormonal contraceptives.<sup>3,4</sup> The average age for onset of menopause slightly varies around the world between different cultural and ethnic groups.<sup>3</sup> In North America, the average age of menopause is approximately 51 years.<sup>4,5</sup> with menstrual cycle irregularities initiating on average around the age of 47.<sup>6</sup> In some women, menopause can occur earlier than average. Premature menopause is when a woman is under the age of 40 and enters menopause either naturally or induced.<sup>2</sup> Early menopause is defined as menopause before the age of 45.<sup>7</sup>

Women may also undergo induced menopause, either surgically or through treatment, prior to onset of expected natural menopause. Surgical menopause includes the removal of both ovaries, usually through a procedure called bilateral oophorectomy (BO).<sup>8</sup> A BO is often, but not always, performed with a hysterectomy. Removal of the uterus alone does not induce surgical menopause in a woman, but hysterectomies have been associated with earlier onset of natural menopause.<sup>8</sup> Undergoing surgical menopause results in an abrupt loss of hormones produced by the ovaries, and these women tend to experience more frequent and severe menopause symptoms

than women in natural menopause.<sup>9</sup> Treatment-induced menopause occurs through the iatrogenic cessation of ovarian function from chemotherapy, radiation or other drug therapy.<sup>7</sup>

Menopause symptoms include vasomotor symptoms (such as hot flashes and night sweats), genitourinary symptoms (such as vaginal dryness/itching, painful intercourse, urinary dysfunction), mood changes (such as depression, anxiety, irritability), difficulties concentrating, sleep disturbances, pain or achiness in the muscles and joints, weight gain and decreased libido or sexual dysfunction.<sup>1,9</sup> These symptoms can accompany the menstrual cycle changes that occur within perimenopause or onset after menopause. Fluctuating estrogen levels in a woman's body during the perimenopausal transition is a lead cause of these symptoms, with influences from psychosocial stressors and aging factors compounding the symptoms' effects on a woman.<sup>1</sup> Symptoms of menopause can appear a few years prior to the final menstrual period and persist into post-menopause. Specifically, the SWAN study showed that vasomotor symptoms affected up to 80% of women with a median persistence of 4.5 years into the post-menopause period, for a median total duration of 7.4 years from when symptoms started to when they self-resolved.<sup>10,11</sup> Whereas genitourinary symptoms, also known as genitourinary syndrome of menopause (GSM), have been shown to be progressive and persistent if not managed, with over 80% of post-menopausal women reporting GSM symptoms such as vaginal dryness, burning, painful intercourse, or dysuria.<sup>12</sup> These symptoms in turn can impact a woman's sexual libido. Both GSM and vasomotor symptoms have been shown to have a negative impact on a woman's quality of life.<sup>13-16</sup> Improving symptoms, notably vasomotor symptoms, has been shown to improve quality of life.<sup>17</sup>

GSM and vasomotor symptoms are the classically associated symptoms when referring to menopause. There is also now a growing understanding on the effects the menopausal

transition has on mood, sleep and cognitive functioning and the overlap of symptoms that may present with other conditions. As Soares and Maki<sup>18</sup> explained, the menopause transition may serve as a ‘window of vulnerability’, where the complex interplay of hormonal changes, psychosocial stressors, changing life responsibilities may increase a woman’s risk of developing depressive symptoms with impacts on overall mood, cognition and, consequently, quality of life at midlife. This has been shown in studies where women were found to be at an increased risk of developing symptoms overlapping with depression during the menopause transition, with risk showing to subside in post-menopause.<sup>19-21</sup> Women with a prior history of mental health issues are at a higher risk of developing menopause-related depressive symptoms.<sup>6, 22</sup> Associations between VMS and the onset of depressive symptoms with corresponding impacts on poorer sleep patterns have been established.<sup>23, 24</sup> Similar correlations have been identified between anxiety, VMS, and sleep disturbances.<sup>25</sup> Sleep disturbances for a midlife woman may present as difficulty falling asleep, repeated night awakenings, early awakening, or excessive daytime fatigue.<sup>25</sup> This fragmentation of sleep has been attributed to factors such as decreasing estrogen levels during the menopausal transition affecting overall sleep patterns and rapid eye movement (REM) sleep achieved, presence of night sweats due to VMS, depression, or psychosocial stressors. When it comes to muscle and joint aches, more than half of women will experience it at some point during menopause.<sup>26</sup> The causal link between estrogen deficiency and onset of musculoskeletal (MSK) pain is still questioned, but associations have been made with presence of MSK pain and depressed mood.<sup>26, 27</sup> Moreover, it has been found women with menopause symptoms are twice as likely to have chronic pain.<sup>28</sup> Hormonal changes in midlife affect fat redistribution in the body, which are compounded with other factors such as less physical activity, resulting in potential for weight gain of up to 8 pounds during perimenopause.<sup>1</sup> This in turn can change how

a woman sees and feels about herself at this point in her life. The complexity of menopause symptoms to occur concurrently, overlap and complicate other symptoms, or even not be present in some women during their menopause transition, signals that menopause is a unique experience to each woman.

### **1.1.2 Management of Menopause**

Management of menopause symptoms includes lifestyle changes, menopausal hormone therapy (MHT), non-hormonal prescription medication, or use of natural or alternative health products. How a woman chooses to manage menopause symptoms is heavily influenced by cultural factors.<sup>29</sup> Current clinical guidelines for vasomotor symptoms and GSM indicate that MHT remains the most effective therapy option.<sup>9,30</sup> MHT can be safely initiated in women less than 60 years of age or within 10 years of menopause and without contraindications.<sup>2,9</sup> Unfortunately, after the initial publication of the Women's Health Initiative (WHI) in 2002,<sup>31</sup> the use of MHT declined worldwide as many women were afraid to use MHT due to safety concerns.<sup>32</sup> Even though subsequent WHI publications have shown more favorable outcomes, low use of MHT continues to this day.<sup>32-34</sup> These fears may push women to considering alternatives for menopause management which may be perceived to have less risk compared to MHT.<sup>35,36</sup> In other situations, use of MHT may be contraindicated or not desired, thus alternatives options are explored.<sup>30</sup>

Vasomotor symptoms can also be managed through use of combined hormonal contraceptives (CHC; in perimenopause only), non-hormonal prescription therapies (including antidepressants – such as serotonin-norepinephrine reuptake inhibitors/SNRIs and selective serotonin reuptake inhibitors/SSRIs, clonidine, gabapentinoids – such as gabapentin and



pregabalin), or lifestyle modifications (including diet modification, exercise, quitting smoking, cooling) to avoid triggers and reduce symptoms.<sup>30, 37</sup>

Treatment of GSM includes vaginal or oral hormone therapy, vaginal lubricants or moisturizers, as well as lifestyle modifications (such as weight loss and exercise).<sup>30</sup> Mood symptoms, including depression and anxiety, can be medically managed with prescription drug therapy options such as antidepressants (SSRIs or SNRIs) or through non-pharmacological approaches.<sup>23</sup> MHT, specifically estrogen, has also shown some efficacy in decreasing depressive symptoms in perimenopausal women but less efficacy in post-menopause.<sup>6, 9</sup> MHT has also been found to be beneficial in directly or indirectly improving sleep, libido, MSK pain and menopause-related weight gain.<sup>9</sup>

Beyond the prescription drug therapy options for menopause management, many women turn to the use of complementary and alternative medicine (CAM) to manage their menopause symptoms.<sup>38, 39</sup> These include the use of natural health products (such as vitamins and minerals, herbal supplements), mind-body practices (such as meditation, relaxation, cognitive behaviour therapy, yoga), or whole system alternative medicine (such as Traditional Chinese Medicine, acupuncture).<sup>39</sup> Many women do not disclose use of CAM to their healthcare provider. Women have reported the reason for this being healthcare provider disinterest on the topic, a lack of healthcare provider's knowledge on CAM use, or use of CAM as a means to gain personal control over their health.<sup>38, 40, 41</sup> Women also perceive alternative approaches as 'natural' and, therefore, more safe than conventional medications.<sup>40</sup> Similarly, there is increasing popularity in use of compounded bioidentical hormone therapy (cBHT) for menopause symptoms due to this apparent discourse of 'natural' and 'safe' alternatives.<sup>42-44</sup> These preparations are specialty compounded or commercially available as plant-derived hormones that are structurally similar to

endogenous hormones. Successful marketing and promotion of cBHT has made it an appealing option for women to consider despite a lack of research data on safety and efficacy, a lack of product regulation and lack of support for its use by evidence-based professional organizations on menopause care.<sup>42, 43, 45, 46</sup> Similar recommendations are made about most CAMs in menopause.<sup>2</sup> In general, the goal of any management strategy should not be to ‘treat’ or ‘cure’ menopausal symptoms but instead, serve as opportunities for women to actively participate in their menopause care and gain a sense of control on their experience.<sup>29</sup>

### **1.1.3 Legalization of Cannabis in Canada**

Over the last two decades, cannabis has undergone a change in legalization status and means of product access for medical and recreational use. It is important to highlight the legalization of cannabis in Canada as it was more of a process that evolved over a 20-year period rather than as a single timepoint. This helps us better understand how Canadians access their cannabis product, how access may influence usage rates and perceptions related to use, and how this may have changed over time since legalization for recreational/non-medical use.

The prohibition of cannabis in Canada started in the early 1920s and remained illegal for use for much of the 19<sup>th</sup> century. Dried cannabis then became legally accessible with restriction for medical purposes in 1999 under a special exemption found in the Controlled Drugs and Substances Act (CDSA).<sup>47</sup> In 2001, after a court decision, medical cannabis officially became legalized for use under Health Canada’s preliminary Marijuana Medical Access Regulations (MMAR).<sup>48</sup> These regulations set by the federal government provided a framework for authorized healthcare providers to access cannabis for patients to use in a range of illnesses or symptoms when conventional therapies had failed prior. Health Canada was the sole provider of medical cannabis at this point in time. Then MMAR was later revised and enacted as the

Marihuana for Medical Purposes Regulations (MMPR) in 2013, which provided production and distribution guidelines for private medical cannabis companies to become licenced providers of medical cannabis in Canada.<sup>49</sup> In 2016, the MMPR was replaced by the Access to Cannabis for Medical Purposes Regulations (ACMPR) after a federal court decision to improve individual access to medical cannabis.<sup>50</sup> The ACMPR outlined regulations for the cannabis industry in licensing, production and distribution of medical cannabis product and allowed individuals to register to produce their own cannabis for personal medical use.<sup>47</sup> The ACMPR did not change healthcare provider authorization processes for medical cannabis and marijuana storefronts remained illegal. To date, Health Canada authorizes physicians and nurse practitioners to prescribe or order medical cannabis for their patients for any condition they deem appropriate.

The Government of Canada's Cannabis Act came into effect October 17, 2018, legalizing the use of non-medical, recreational cannabis in Canada, only the second country to fully do so after Uruguay.<sup>51, 52</sup> Initially, only dried cannabis flower and oils were legalized for recreational use, while cannabis derivative products remained restricted. One year later, on October 17, 2019, cannabis derivative products (such as edibles, extracts, topicals, and beverages) became legal for use in Canada. Since then, a wide range of products derived from the cannabis plant have been released into the medical and recreational markets. As of 2020, smoking cannabis flower still remains the most prevalent method of consumption of cannabis.<sup>53</sup> There has been a growing shift to other methods (such as edibles), since the legalization of derivative cannabis products in 2019. Notably, more women are now increasingly consuming edibles and less are using dried flower products as compared to before legalization.<sup>53</sup>

Legalization has led to a significant rise in population use of cannabis in Canada. As of 2020, 1 in 5 Canadians aged 15 and over (18.4% females and 21.1% males) have reported using

cannabis in the past three months and 7.9% (7.4% females and 8.1% males) reported using daily for either recreational or medical use purposes.<sup>53</sup> Pre-legalization rates for use within past three months and daily use were reported as 14.0% and 5.4% respectively.<sup>53</sup> Specifically in Alberta, 21.7% of the population aged 15 and over reported recent cannabis use.<sup>53</sup>

Within the first year of legalization, males were initially more likely to use cannabis as compared to females.<sup>54</sup> However, Statistics Canada reported at the end of 2020 use within females had increased to a point where usage rates were equal between sexes.<sup>53</sup> Cannabis use still remains the most prevalent amongst the young adult populations (18-24 years of age). Still, usage within the midlife population has significantly increased, where those aged 25 to 44 years of age increased from 21.4% before legalization to 30.3% by the end of 2020, and those aged 45 and more increased from 7.0% to 10.5%.<sup>53</sup>

Accessibility to cannabis products may be one of the main drivers to increased cannabis use in Canada. The Cannabis Act outlines a framework for the production, distribution, sale and possession of cannabis within Canada as a means to protect and prevent youth from using cannabis, ensure public safety when it comes to using cannabis, and mitigate illegal cannabis activity.<sup>51</sup> The Act also gives authority to each province and territory in Canada to establish their own method of cannabis sale and distribution. In Alberta, the Alberta Cannabis Framework allows privately-owned, in-person stores to sell cannabis product and the provincial government controls online sales.<sup>55</sup> Since legalization of cannabis in 2018, there has been a shift in accessing cannabis product from legal sources as compared to pre-legalization where cannabis was predominantly sourced illegally or obtained from family and friends.<sup>53</sup>

Since the first quarter of 2014, medical cannabis authorization has grown dramatically from 7,914 clients registered with Health Canada to 342,103 clients at the time of recreational

cannabis legalization in 2018.<sup>56</sup> As of 2021, the number of active registrations for medical cannabis has now fallen below 300,000.<sup>57</sup> This may be as a result of Canadians accessing non-medical cannabis for medical reasons. A Consumer Health Products Canada report showed over 800,000 Canadians are now using non-medical cannabis for the management of their health without medical advice.<sup>58</sup> Additionally, a recent Canadian survey showed over one-third of participants used cannabis medically, yet only 23.4% of those surveyed had cannabis medically authorized.<sup>59</sup> Patients accessing cannabis product beyond the medical route may not be the sole reason for these discrepancies. Health professionals are hesitant to prescribe cannabis in their practice, citing lack of research evidence on efficacy and safety as a major barrier.<sup>60-62</sup> Despite this, many Canadians argue that cannabis products are effective, lower risk, natural alternatives to conventional drug therapies.<sup>61</sup> What this shows is that legalization of cannabis in Canada has led Canadians to be more interested and willing to use cannabis for medical reasons, regardless of healthcare provider involvement.

#### **1.1.4 Cannabis for Medical Purposes**

Cannabis has been utilized medically for centuries by many different cultural groups across the world, with reports of use in a wide range of ailments and symptoms in the human body.<sup>63, 64</sup> For example, the Indian Hemp Drugs Commission from 1894 references the historical use of cannabis in women's health conditions, such as for the management of dysmenorrhea, menorrhagia, childbirth and use as an aphrodisiac.<sup>63, 64</sup> Despite going through a period of prohibition, acknowledgement of cannabis' medicinal properties in North America began in the 19<sup>th</sup> century and remains today. Many of the indications and health claims made for cannabis are largely anecdotal and passed down through sharing of personal experiences.<sup>65</sup> Current clinical guidelines in Canada grounded in scientific evidence recommend limiting use of medical

cannabinoids to chronic pain, spasticity, or chemotherapy-induced nausea and vomiting as an alternative or adjunct therapy when other first-line options have failed.<sup>65, 66</sup> However, there is emerging evidence and active research being done in the areas of, but not limited to, rheumatological conditions, epilepsy, other neurological conditions, and mood disorders.<sup>65</sup>

Over 500 compounds have been identified in the cannabis plant (including cannabinoids, terpenes and flavonoids) with the two cannabinoids most studied for their therapeutic effects being  $\Delta$ -9-tetrahydrocannabinol (THC) and cannabidiol (CBD).<sup>67</sup> THC is the main psychoactive component, while CBD is considered non-psychoactive and can modulate THC euphoric effects. Terpenes play a role in the plant's aroma or flavour and have also been shown to work synergistically with cannabinoids in what has been termed as the 'entourage effect' to produce a therapeutic outcome.<sup>67, 68</sup> THC interacts with cannabinoid receptors found ubiquitously throughout the body, compromising the endocannabinoid system, but concentrating mostly in the central nervous system (cannabinoid receptor 1; CB1) and immune system (cannabinoid receptor 2; CB2). The CB1 and CB2 receptors of the endocannabinoid system have endogenous ligands called endocannabinoids (anandamide and 2-arachidonoylglycerol) which function to modulate nerve cell signalling and maintain body homeostasis.<sup>69</sup> CBD indirectly interacts with the CB1 receptor by acting as a non-competitive negative allosteric modulator, thus explaining its mechanism of counteracting THC effects.<sup>70</sup>

The cannabis plant has led to the production of plant-derived pharmaceutical cannabinoids (such as nabilone, nabiximols and dronabinol) and novel chemical compounds called synthetic cannabinoids. Through refinement in cannabis cultivation over the past few decades, the overall potency of cannabinoids (specifically THC) found in cannabis plants has increased.<sup>71, 72</sup> It has been documented that cannabis grown at present is upwards of 20 to 30-fold

more potent.<sup>72</sup> By varying the concentrations of THC or CBD, or a combination of both, the user may achieve the intended therapeutic or desired euphoric effect, as well as influence possible adverse effects. Moreover, the effects of cannabis are further subject to the formulation type and route of administration. Therefore, dosing of cannabis becomes highly individualized, with many methods of administration now easily available in Canada (such as inhaled, oral, sublingual, transdermal), and most individuals are left self-managing their cannabis regimen for medical purposes to optimize the best effect for them.<sup>73</sup>

### **1.1.5 Cannabis and Menopause**

The endocannabinoid system has been found to play a role in the female reproductive system, from regulation of reproductive hormone secretion throughout the body to impacting ovarian function.<sup>74</sup> Exposure to cannabis thus introduces exogenous cannabinoids into the body with possible direct influences in a woman's health across her reproductive life span. However, the effects are still largely unknown and being investigated as the understanding of the endocannabinoid system grows. Much of the research on cannabis in the women's health area has been done within the perinatal period, investigating the effects and possible adverse outcomes associated with cannabis use during pregnancy or on fertility.<sup>75, 76</sup> However, it is important to note when examining previous literature for cannabis studies, the legalization status of cannabis at the time of conducting and publishing the research and the reasons for cannabis use must be taken into consideration. Much of the published research on cannabis has been conducted historically at a time of its prohibition or use for predominantly recreational reasons. Only recently has there been a widespread shift in acceptance accompanied by emerging curiosity on the role of cannabis in medicine.

A recent report by Health Canada shows that Canadians are interested in using cannabis for menopause symptoms.<sup>61</sup> This same report highlighted women in menopause as a sub-population that should have cannabis easily accessible for the self-management of symptoms related to pain, sleep or mood.<sup>61</sup> When searching the literature for studies specifically on cannabis and menopause, there is a paucity in published research found. A recent systematic review<sup>77</sup> conducted showed only three relevant studies investigating the effect of cannabis on menopause symptoms.<sup>78-80</sup> First, Benedikt et al.<sup>78</sup> investigated the effects of smoked cannabis on pulse rate and mood in post-menopausal women and found increases in pulse rate and levels of intoxication with cannabis use with increased confusion and decreased arousal. Fantry et al.<sup>80</sup> also indirectly examined effects of cannabis on menopause, but in a group of HIV-infected women, and found an association of hot flashes with cannabis use. Finally, Slavin, Farmer, and Earleywine<sup>79</sup> is possibly the first study published directly exploring women's use of cannabis for menopause symptoms. They surveyed women in menopause to explore the expected therapeutic effects of cannabis used for menopause symptoms and highlighted women expected cannabis to relieve musculoskeletal discomfort, sleep issues, mood changes and hot flashes.<sup>79</sup> Our research group completed a broad search on cannabis use over the course of a woman's reproductive life span identifying the same studies and further emphasizing a lack of previous research on cannabis use during the menopause period.<sup>75</sup> This unfortunately signals that little evidence is available about the effects of cannabis for menopausal symptoms, both in efficacy and safety in use. Still, cannabis has been found to be publicly promoted online for many health claims including anxiety, depression, insomnia, and pain through the use of internet and social media platforms, potentially influencing decisions made regarding its use.<sup>81</sup> Our research team further verified this by showing that the most frequently reported online health claims made by websites



selling medical cannabis in Canada included pain, sleep disturbances, and mood changes.<sup>82</sup>

These symptoms overlap with the same symptoms experienced during menopause. Due to this symptom overlap with many proposed health claims made, it is not surprising that women may be influenced to take cannabis for the management of their menopause symptoms despite little scientific evidence supporting this indication.

## **1.2 STATEMENT OF THE PROBLEM**

Despite living approximately one-third of their life in post-menopause, women still feel largely unprepared for this transition and symptoms experienced may go untreated medically.<sup>1, 83</sup> Moreover, due to the complexity of symptom overlap, women may not even attribute certain symptoms, such as anxiety, to menopause itself.<sup>84</sup> Therefore, there is a need to explore the approaches midlife women use to manage symptoms which coincide with menopause and, more specifically, investigate if cannabis is being used to do so.

There is an evidence gap on the use of cannabis by women for this indication. Our search of the literature<sup>75</sup> and other published reviews<sup>76, 77</sup> acknowledge this lack of evidence. Clinically, this makes it difficult for health professionals to apply evidence-based practice to guide patient decision-making when it comes to using cannabis for menopause symptoms. By going directly to women to ask about their experiences, we gain insights on current cannabis use patterns in this population, identify future research needs, establish a platform of knowledge for developing clinical resources on the safe and appropriate use of cannabis, all while empowering women to share their menopause experience.

## **1.3 THESIS OBJECTIVES**

The purpose of this thesis was two-fold to, first, establish whether midlife women are using cannabis for medical purposes related to menopause and, second, to explore the

experiences of women in menopause who use cannabis. The following objectives were set to achieve this:

- (1) To characterize prior and current use of cannabis in menopausal women.
- (2) To characterize perceptions of cannabis used for medical purposes in women experiencing menopause.
- (3) To understand the personal experiences of women who use or have used cannabis to manage symptoms of menopause, as well as their perceived risks and benefits.
- (4) To describe women's expectations with cannabis used for medical purposes, specifically related to administration and dose of cannabis, how it is accessed, and information resources utilized.

For this thesis, I hypothesized that midlife women who were symptomatic during menopause were more likely to use cannabis for medical purposes. From these findings, the following research question was explored: What are the experiences and perceptions of midlife women in using cannabis for medical purposes overlapping with menopause symptoms?

## **1.4 OVERALL METHODS**

### **1.4.1 Mixed Methods Research Design**

The overall research project was conducted following a two-phase, explanatory sequential design in mixed methods research (MMR), which included an initial quantitative survey with qualitative follow-up (see Figure 1.1).<sup>85</sup> MMR draws from the respective strengths of both qualitative and quantitative methods and allows researchers the flexibility in being able to mix and/or combine different approaches.<sup>86</sup> The first phase of the project gathers initial quantitative data with a cross-sectional survey of women living in Alberta. In the second

qualitative phase, we explore the experiences of women using cannabis for medical purposes by applying qualitative description in conducting one-on-one, semi-structured interviews. This form of explanatory sequential mixed methods design allows the first phase to establish current cannabis use patterns in this cohort, guide the selection of participants, and refine interview questions, with the second phase providing context behind the initial survey data captured.<sup>85, 87</sup>

#### **1.4.2 Researcher's Positionality Statement**

For this project, I sought to apply the pragmatist worldview, which focuses on actionable results within real-world practice. This worldview supports utilizing a pluralistic approach (e.g. both qualitative and quantitative methods) that is often associated with mixed methods research.<sup>85, 88</sup> With this in mind, my ontological assumptions about the nature of reality are that all individuals have their own unique interpretations (multiple realities) within a single, real world.<sup>85</sup> The epistemological assumption on the nature of knowledge in pragmatism is grounded in practicality, where the researchers collect data by 'what works' in order to answer the research question and inform outcomes.<sup>85</sup> These assumptions influenced the two-phase data collection approach utilized in this thesis. First, quantitative survey data was collected to establish a platform of knowledge on this phenomenon of interest – cannabis use in menopause. The second, follow-up phase consisting of qualitative interviews, helped inform and explain findings identified in the first phase shaped directly by the experiences of women using cannabis for symptom management.

When specifically discussing the qualitative aspect of this project, I define my positionality following Savin-Baden and Howell-Major's<sup>89</sup> three primary ways, as outlined in Holmes<sup>90</sup>: (1) locate self in subject, (2) locate self among the participants, and (3) locate self among the research context and process. I exhibited both insider and outsider positions

throughout the qualitative research process. My position within the research subject is that of a health care professional, more specifically a pharmacist, where my role was to better understand methods patients use to manage their symptoms to improve care and patient outcomes. This is the lens I applied for analyzing the data collected throughout the research process. However, I decided to approach conducting interviews from the position of a graduate student, not disclosing my profession directly to participants. I did this with the intent to prevent influencing participant responses when discussing roles of healthcare providers in their menopause care and cannabis use. This was done to prevent the influence of my role as a healthcare professional on women's responses so as to better understand patient experiences and identify possible gaps in care women have. As a woman, I expect to live the 'lived experience' of various women's health-related life stages as I age. My research is focused on midlife women's health, specifically menopause. I acknowledge that I am not in the similarly aged cohort as my target study participants, but I feel this opened my ability to approach my participant's experiences with less of my own personal biases yet remain close to the lived familiarity by identifying as a woman.

Lastly, the research described in this thesis took place in Alberta, Canada, where cannabis is now fully legalized for medical and recreational use. Not only did this research take place at a revolutionary time period with recent cannabis legalization, but the project was designed and conducted during the COVID-19 global pandemic. The project was largely impacted by the restrictions put in place during this time and was forced to evolve and quickly adapt in innovative ways to the current conditions of these unprecedented times. Acknowledging the pandemic and resulting restrictions provides context to the possible influences the social dynamics of the pandemic may have had on the research process and the perspectives of the participants sharing their experiences.

## 1.5 THESIS OUTLINE

The outline of the thesis is as follows:

**Chapter 1** provides a background summary on menopause, management options, and introduced cannabis use for medical purposes with potential for overlap with menopause symptoms. An outline of the thesis, objectives and overall methodology is also included.

**Chapter 2** is the first project for the thesis describing the first phase of the mixed methods study, the cross-sectional, quantitative survey of midlife women living in Alberta in order to characterize cannabis use patterns and perceptions.

**Chapter 3** is the second project describing the second phase of the mixed methods study, the qualitative follow-up using semi-structured interviews to explore experiences of women using cannabis for medical purposes.

**Chapter 4** provides the overall summary and discussion on the research conducted, the clinical implications of this thesis, and future opportunities for research in this area.

## 1.6 REFERENCES

1. Minkin MJ. Menopause: Hormones, Lifestyle, and Optimizing Aging. *Obstetrics and Gynecology Clinics of North America*. 2019;46(3):501-14.
2. Baber RJ, Panay N, Fenton A, Group IMSW. 2016 IMS Recommendations on women's midlife health and menopause hormone therapy. *Climacteric*. 2016;19(2):109-50.
3. Palacios S, Henderson VW, Siseles N, Tan D, Villaseca P. Age of menopause and impact of climacteric symptoms by geographical region. *Climacteric*. 2010;13(5):419-28.
4. Gold EB, Bromberger J, Crawford S, Samuels S, Greendale GA, Harlow SD, et al. Factors Associated with Age at Natural Menopause in a Multiethnic Sample of Midlife Women. *American Journal of Epidemiology*. 2001;153(9):865-74.
5. Costanian C, McCague H, Tamim H. Age at natural menopause and its associated factors in Canada: cross-sectional analyses from the Canadian Longitudinal Study on Aging. *Menopause*. 2018;25(3):265-72.
6. Soares CN, Taylor V. Effects and Management of the Menopausal Transition in Women With Depression and Bipolar Disorder. *Journal of Clinical Psychiatry*. 2007;68:16-21.
7. Shifren JL, Gass ML, Group NRfCCoMWW. The North American Menopause Society recommendations for clinical care of midlife women. *Menopause*. 2014;21(10):1038-62.
8. Hendrix SL. Bilateral oophorectomy and premature menopause. *Am J Med*. 2005;118 Suppl 12B:131-5.
9. The North American Menopause Society. The 2017 hormone therapy position statement of The North American Menopause Society. *Menopause*. 2017;24(7):728-53.
10. Avis NE, Crawford SL, Greendale G, Bromberger JT, Everson-Rose SA, Gold EB, et al. Duration of menopausal vasomotor symptoms over the menopause transition. *JAMA Intern Med*. 2015;175(4):531-9.
11. El Khoudary SR, Greendale G, Crawford SL, Avis NE, Brooks MM, Thurston RC, et al. The menopause transition and women's health at midlife: a progress report from the Study of Women's Health Across the Nation (SWAN). *Menopause*. 2019;26:1213-27.
12. The North American Menopause Society. The 2020 genitourinary syndrome of menopause position statement of The North American Menopause Society. *Menopause*. 2020;27(9):976-92.

13. Nappi RE, Palacios S, Bruyniks N, Particco M, Panay N, EVES Study Investigators. The burden of vulvovaginal atrophy on women's daily living: implications on quality of life from a face-to-face real-life survey. *Menopause*. 2019;26(5):485-91.
14. Nappi RE, Kroll R, Siddiqui E, Stoykova B, Rea C, Gemmen E, et al. Global cross-sectional survey of women with vasomotor symptoms associated with menopause: prevalence and quality of life burden. *Menopause*. 2021;28:875-82.
15. Williams RE, Levine KB, Kalilani L, Lewis J, Clark RV. Menopause-specific questionnaire assessment in US population-based study shows negative impact on health-related quality of life. *Maturitas*. 2009;62(2):153-9.
16. Blumel JE, Chedraui P, Baron G, Belzares E, Bencosme A, Calle A, et al. A large multinational study of vasomotor symptom prevalence, duration, and impact on quality of life in middle-aged women. *Menopause*. 2011;18(7):778-85.
17. Pinkerton JV, Abraham L, Bushmakina AG, Cappelleri JC, Komm BS. Relationship between changes in vasomotor symptoms and changes in menopause-specific quality of life and sleep parameters. *Menopause*. 2016;23(10):1060-6.
18. Soares CN, Maki PM. Menopausal transition, mood, and cognition: an integrated view to close the gaps. *Menopause*. 2010;17(4):812-4.
19. Schmidt PJ, Haq N, Rubinow DR. A Longitudinal Evaluation of the Relationship Between Reproductive Status and Mood in Perimenopausal Women. *The American Journal of Psychiatry*. 2004;161:2238-44.
20. Freeman EW, Sammel MD, Liu L, Gracia CR, Nelson DB, Hollander L. Hormones and Menopausal Status as Predictors of Depression in Women in Transition to Menopause. *Archives of General Psychiatry*. 2004;61:62-70.
21. Bromberger J, Meyer PM, Kravits HM, Sommer B, Cordal A, Powell L, et al. Psychologic Distress and Natural Menopause: A Multiethnic Community Study. *American Journal of Public Health*. 2001;91:1435-42.
22. Bromberger JT, Schott L, Kravitz HM, Joffe H. Risk factors for major depression during midlife among a community sample of women with and without prior major depression: are they the same or different? *Psychol Med*. 2015;45(8):1653-64.

23. Maki PM, Kornstein SG, Joffe H, Bromberger JT, Freeman EW, Athappilly G, et al. Guidelines for the evaluation and treatment of perimenopausal depression: summary and recommendations. *Menopause*. 2018;25(10):1069-85.
24. Moreno-Frias C, Figueroa-Vega N, Malacara JM. Relationship of sleep alterations with perimenopausal and postmenopausal symptoms. *Menopause*. 2014;21(9):1017-22.
25. Guidozi F. Sleep and sleep disorders in menopausal women. *Climacteric*. 2013;16(2):214-9.
26. Szoek CE, Cicuttini FM, Guthrie JR, Dennerstein L. The relationship of reports of aches and joint pains to the menopausal transition: a longitudinal study. *Climacteric*. 2008;11(1):55-62.
27. Watt FE. Musculoskeletal pain and menopause. *Post Reprod Health*. 2018;24(1):34-43.
28. Gibson CJ, Li Y, Bertenthal D, Huang AJ, Seal KH. Menopause symptoms and chronic pain in a national sample of midlife women veterans. *Menopause*. 2019;26(7):708-13.
29. Hall L, Callister LC, Berry JA, Matsumura G. Meanings of menopause: Cultural influences on perception and management of menopause. *Journal of Holistic Nursing*. 2007;25(2):106-18.
30. Reid R, Abramson BL, Blake J, Desindes S, Dodin S, Johnston S, et al. Managing Menopause. *Journal of Obstetrics and Gynaecology Canada*. 2014;36(9):830-3.
31. Rossouw JE, Anderson GL, Prentice RL, LaCroix AZ, Kooperberg C, Stefanick ML, et al. Risks and benefits of estrogen plus progestin in healthy postmenopausal women: principal results From the Women's Health Initiative randomized controlled trial. *JAMA*. 2002;288(3):321-33.
32. Ettinger B, Wang SM, Leslie RS, Patel BV, Bouliware MJ, Mann ME, et al. Evolution of postmenopausal hormone therapy between 2002 and 2009. *Menopause*. 2012;19(6):610-5.
33. Steinkellner AR, Denison SE, Eldridge SL, Lenzi LL, Chen W, Bowlin SJ. A decade of postmenopausal hormone therapy prescribing in the United States: long-term effects of the Women's Health Initiative. *Menopause*. 2012;19(6):616-21.
34. Costanian C, Edgell H, Ardern CI, Tamim H. Hormone therapy use in the Canadian Longitudinal Study on Aging: a cross-sectional analysis. *Menopause*. 2018;25(1):46-53.
35. Lobo RA. Hormone-replacement therapy: current thinking. *Nature Reviews Endocrinology*: Nature Publishing Group; 2017. p. 220-31.



36. Kang HJ, Ansbacher R, Hammoud MM. Use of alternative and complementary medicine in menopause. *International Journal of Gynecology and Obstetrics*. 2002;79:195-207.
37. SIGMA. Pocket Guide Menopause Management: A practical tool for healthcare professionals Canadian Menopause Society/Société Canadienne de Ménopause (CMS/SCM)n.d. [1-52]. Available from:  
<https://www.sigmamenopause.com/sites/default/files/pdf/publications/Final-Pocket%20Guide.pdf>.
38. Posadzki P, Lee MS, Moon TW, Choi TY, Park TY, Ernst E. Prevalence of complementary and alternative medicine (CAM) use by menopausal women: a systematic review of surveys. *Maturitas*. 2013;75(1):34-43.
39. Johnson A, Roberts L, Elkins G. Complementary and Alternative Medicine for Menopause. *J Evid Based Integr Med*. 2019;24:1-14.
40. Seidl MM, Stewart DE. Alternative treatments for menopausal symptoms. Qualitative study of women's experiences. *Canadian Family Physician*. 1998;44:1271.
41. Ma J, Drieling R, Stafford RS. US women desire greater professional guidance on hormone and alternative therapies for menopause symptom management. *Menopause*. 2006;13(3):506-16.
42. Yuksel N, Treseng L, Malik B, Ogbogu U. Promotion and marketing of bioidentical hormone therapy on the internet: a content analysis of websites. *Menopause*. 2017;24(10):1129-35.
43. Fishman JR, Flatt MA, Settersten RA, Jr. Bioidentical hormones, menopausal women, and the lure of the "natural" in U.S. anti-aging medicine. *Soc Sci Med*. 2015;132:79-87.
44. Thompson JJ, Ritenbaugh C, Nichter M. Why women choose compounded bioidentical hormone therapy: lessons from a qualitative study of menopausal decision-making. *BMC Womens Health*. 2017;17(1):97.
45. ACOG. The American College of Obstetricians and Gynecologists Committee Opinion #532: Compounded Bioidentical Menopausal Hormone Therapy. *Obstetrics & Gynecology*. 2012;120:411-5.
46. National Academies of Sciences E, and Medicine,. In: Jackson LM, Parker RM, Mattison DR, editors. *The Clinical Utility of Compounded Bioidentical Hormone Therapy: A Review of Safety, Effectiveness, and Use*. Washington (DC)2020.

47. Health Canada. Understanding the New Access to Cannabis for Medical Purposes Regulations Government of Canada 2016 [updated 30 Sept 2016; cited 2021 05 May]. Available from: <https://www.canada.ca/en/health-canada/services/publications/drugs-health-products/understanding-new-access-to-cannabis-for-medical-purposes-regulations.html>.
48. Government of Canada. Marihuana Medical Access Regulations Justice Laws Website: Government of Canada; 2001 [updated 06 June 2013; cited 2021 05 May]. Available from: <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2001-227/20100311/P1TT3xt3.html>.
49. Government of Canada. Marihuana for Medical Purposes Regulations Justice Laws Website: Government of Canada; 2013 [updated 30 Sept 2013; cited 2021 12 May]. Available from: <https://laws-lois.justice.gc.ca/eng/regulations/sor-2013-119/20130607/P1TT3xt3.html>.
50. Government of Canada. Access to Cannabis for Medical Purposes Regulations Justice Laws Website: Government of Canada 2016 [updated 23 Aug 2016; cited 2021 12 May]. Available from: <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2016-230/20160805/P1TT3xt3.html>.
51. Government of Canada. Cannabis Act Justice Laws Website: Government of Canada; 2018 [updated 17 Oct 2021; cited 2021 11 May 2021]. Available from: <https://laws-lois.justice.gc.ca/eng/acts/c-24.5/page-1.html#h-76881>.
52. Hawley P, Gobbo M, Afghari N. The impact of legalization of access to recreational Cannabis on Canadian medical users with Cancer. *BMC Health Serv Res.* 2020;20(1):977.
53. Rotermann M. Looking back from 2020, how cannabis use and related behaviours changed in Canada. *Health Reports.* 2021;32(no. 82-003-X):1-14.
54. Rotermann M. What has changed since cannabis was legalized? *Health Reports.* 2020;31(2):11-20.
55. Government of Alberta. Alberta Cannabis Frameworks and Legislation Government of Alberta 2021 [updated No date; cited 2021 10 May]. Available from: <https://www.alberta.ca/cannabis-framework.aspx#p6241s3>.
56. Health Canada. ARCHIVED – market data under the Access to Cannabis for Medical Purposes Regulations Government of Canada [updated 29 August 2019]. Available from: <https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/licensed-producers/market-data.html>.

57. Health Canada. Data on cannabis for medical purposes Government of Canada: Health Canada; [updated 15 June 2021; cited 2021 15 July]. Available from: <https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/research-data/medical-purpose.html>.
58. Consumer Health Products Canada. Full Public Policy Position – Cannabis Regulation Ottawa, ON2019 [1-3]. Available from: <https://www.chpcanada.ca/wp-system/uploads/2019/11/Canabis-position-statement.2019.pdf>.
59. Turna J, Balodis I, Munn C, Van Ameringen M, Busse J, MacKillop J. Overlapping patterns of recreational and medical cannabis use in a large community sample of cannabis users. *Compr Psychiatry*. 2020;102:152188.
60. Ng JY, Gilotra K, Usman S, Chang Y, Busse JW. Attitudes toward medical cannabis among family physicians practising in Ontario, Canada: a qualitative research study. *CMAJ Open*. 2021;9(2):E342-E8.
61. Health Canada. Summary report: Consultation on potential market for health products containing cannabis that would not require practitioner oversight [Publication]. Government of Canada [updated 25 September 2020. Available from: <https://www.canada.ca/en/health-canada/services/publications/drugs-health-products/summary-report-consultation-potential-market-health-products-cannabis.html>.
62. Christensen VA, Nugent SM, Ayers CK, Morasco BJ, Kansagara D. A qualitative study of VHA clinicians' knowledge and perspectives on cannabis for medical purposes. *Fam Pract*. 2021;38(4):479-83.
63. Touw M. The religious and medicinal uses of Cannabis in China, India and Tibet. *J Psychoactive Drugs*. 1981;13(1):23-34.
64. Russo E. Cannabis Treatments in Obstetrics and Gynecology: A Historical Review. *Journal of Cannabis Therapeutics*. 2002;2(3-4):5-35.
65. Health Canada. Information for Health Care Professionals: Cannabis (marihuana, marijuana) and the cannabinoids Health Canada2018 [updated Oct 2018; cited 2021 18 May]. Available from: <https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/information-medical-practitioners/information-health-care-professionals-cannabis-cannabinoids.html#a4.0>.

66. Allan GM, Ramji J, Perry D, Ton J, Beahm NP, Crisp N, et al. Simplified guideline for prescribing medical cannabinoids in primary care. *Canadian Family Physician*. 2018;64(2):111-20.
67. Aizpurua-Olaizola O, Soydaner U, Öztürk E, Schibano D, Simsir Y, Navarro P, et al. Evolution of the Cannabinoid and Terpene Content during the Growth of Cannabis sativa Plants from Different Chemotypes. *Journal of Natural Products*. 2016;79:324-31.
68. Russo EB. Taming THC: potential cannabis synergy and phytocannabinoid-terpenoid entourage effects. *Br J Pharmacol*. 2011;163(7):1344-64.
69. Zou S, Kumar U. Cannabinoid Receptors and the Endocannabinoid System: Signaling and Function in the Central Nervous System. *Int J Mol Sci*. 2018;19(3).
70. Laprairie RB, Bagher AM, Kelly ME, Denovan-Wright EM. Cannabidiol is a negative allosteric modulator of the cannabinoid CB1 receptor. *Br J Pharmacol*. 2015;172(20):4790-805.
71. Chandra S, Radwan MM, Majumdar CG, Church JC, Freeman TP, ElSohly MA. New trends in cannabis potency in USA and Europe during the last decade (2008-2017). *Eur Arch Psychiatry Clin Neurosci*. 2019;269(1):5-15.
72. McLaren J, Swift W, Dillon P, Allsop S. Cannabis potency and contamination: a review of the literature. *Addiction*. 2008;103(7):1100-9.
73. MacCallum CA, Russo EB. Practical considerations in medical cannabis administration and dosing. *European Journal of Internal Medicine*. 2018;49:12-9.
74. Walker OS, Holloway AC, Raha S. The role of the endocannabinoid system in female reproductive tissues. *J Ovarian Res*. 2019;12(1):3.
75. Babyn K, Kung J, Mayo P, Yuksel N, editors. Understanding the efficacy and safety of cannabis use in women's health: A scoping review. *Canadian Pharmacy Education and Research Conference (CPERC)*; 2019 12-13 June 2019; Edmonton, AB.
76. Corsi DJ, Murphy MSQ, Cook J. The Effects of Cannabis on Female Reproductive Health Across the Life Course. *Cannabis and Cannabinoid Research*. 2020;6(4):275-87.
77. Mejia-Gomez J, Phung N, Philippopoulos E, Murphy KE, Wolfman W. The impact of cannabis use on vasomotor symptoms, mood, insomnia and sexuality in perimenopausal and postmenopausal women: a systematic review. *Climacteric*. 2021:1-10.
78. Benedikt RA, Cristofaro P, Mendelson JH, Mello NK. Effects of acute marijuana smoking in post-menopausal women. *Psychopharmacology*. 1986;90(1):14-7.

79. Slavin MN, Farmer S, Earleywine M. Expectancy mediated effects of marijuana on menopause symptoms. *Addiction Research & Theory*. 2016;24(4):322-9.
80. Fantry LE, Zhan M, Taylor GH, Sill AM, Flaws JA. Age of menopause and menopausal symptoms in HIV-infected women. *AIDS Patient Care & STDs*. 2005;19(11):703-11.
81. Bierut T, Krauss MJ, Sowles SJ, Cavazos-Rehg PA. Exploring Marijuana Advertising on Weedmaps, a Popular Online Directory. *Prev Sci*. 2017;18(2):183-92.
82. Yuksel N, Ke S, Wong A, Yu X, Ogbogu U, Necyk C, editors. Promotion and Marketing of Medical Marijuana on the Internet. Abstracts for the 16th World Congress of the IMS; 2018; Vancouver.
83. Marlatt KL, Beyl RA, Redman LM. A qualitative assessment of health behaviors and experiences during menopause: A cross-sectional, observational study. *Maturitas*. 2018;116:36-42.
84. Bremer E, Jallo N, Rodgers B, Kinser P, Dautovich N. Anxiety in Menopause: A Distinctly Different Syndrome? *The Journal for Nurse Practitioners*. 2019;15(5):374-8.
85. Creswell JW, Plano Clark VL. *Designing and Conducting Mixed Methods Research*. 3rd ed. Los Angeles: SAGE Publications; 2017. 492 p.
86. Greene JC, Caracelli VJ, Graham WF. Toward a conceptual framework for mixed-method evaluation designs. *Educational evaluation and policy analysis*. 1989;11(3):255-74.
87. Morgan DL. Practical strategies for combining qualitative and quantitative methods: Applications to health research. *Qualitative health research*. 1998;8(3):362-76.
88. Morgan DL. Pragmatism as a Paradigm for Social Research. *Qualitative Inquiry*. 2014;20(8):1045-53.
89. Savin-Baden M, Howell-Major C. *Qualitative research: The essential guide to theory and practice*: Routledge; 2013.
90. Holmes AGD. Researcher Positionality - A Consideration of Its Influence and Place in Qualitative Research - A New Researcher Guide. *Shanlax International Journal of Education*. 2020;8(4):1-10.

## EXPLANATORY SEQUENTIAL DESIGN

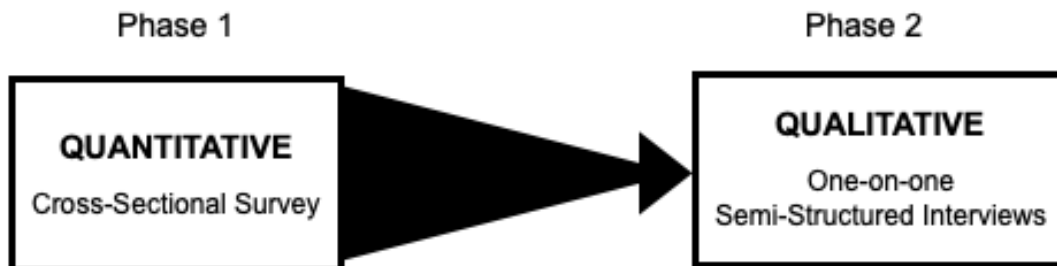


Figure 1.1 Visual diagram of the mixed methods research (MMR) study following an explanatory sequential approach with qualitative follow-up. Study was completed in two phases [QUAN→ qual] in order to complete data collection and analysis

## CHAPTER 2. QUANTITATIVE SURVEY

### CANNABIS USE IN MIDLIFE WOMEN: A SURVEY ON USAGE PATTERNS AND PERCEPTIONS

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## **Abstract**

**Objectives:** Use of cannabis has increased in Canada since the legalization of recreational cannabis in 2018, with growing interest to manage health issues that overlap with symptoms of menopause. Midlife women may be using cannabis medically to manage menopause symptoms. As part of a mixed methods study, the purpose of the survey was to characterize cannabis use patterns and perceptions in midlife women.

**Methods:** A cross-sectional, web-based survey was designed by the research team and hosted on Qualtrics. Inclusion criteria for participation was women, ages 35 and over, and living in Alberta. Recruitment occurred between October to December 2020 through social media (Facebook, Instagram, and Twitter) using post-sharing and targeted-ad campaigns. Survey questions collected information on demographics, clinical data used to categorize menopause stage, cannabis use characteristics, information sources, overall perceptions and were available in English-only. Descriptive statistics, between-group comparative analysis, and logistic regression were used to analyze the quantitative data collected. Free response answers underwent qualitative content analysis to depict general perceptions towards cannabis use in menopause.

**Results:** A total of 1,485 responses were included for analysis (median age of 49 years; IQR= 43-55). One-third (33%) of women were categorized in perimenopause and 35% in post-menopause, while 13% had a hysterectomy and 4% had a bilateral oophorectomy. Most commonly reported menopause symptoms were difficulty with sleep (65%), difficulty with concentration (49%), and anxiety (49%). Over one-third (34%) of women reported using cannabis within the last 30 days, and 65% indicated ever using cannabis. Over 75% of women were currently using cannabis for medical purposes, yet only 23% had cannabis medically prescribed. Commonly used forms of cannabis were edibles (52%) and oils (47%), and



frequency of use varied. Most common reasons for current use were sleep issues (65%), anxiety (45%), and muscle and joint achiness (33%), where three-quarters (74%) of current users found cannabis to be helpful with their menopause symptoms. Current cannabis users were more likely to report experiencing menopause symptoms as compared to non-users. History of smoking and health status were significant independent predictors of current cannabis use. Commonly used sources of information on cannabis were internet searchers (46%) and family or friends (34%).

**Conclusion:** Midlife women are using cannabis for symptoms which overlap with menopause. Women who currently use cannabis reported more menopause symptoms compared to women who are not using cannabis. Information about cannabis was more frequently accessed through online searches and personal contacts rather than healthcare providers. Further research is required to assess the safety and efficacy of cannabis for menopausal symptoms, as well as develop clinical resources for women.

## 2.1 INTRODUCTION

Menopause is part of the natural reproductive aging process where a woman undergoes hormonal changes and ceases menses. Up to 80% of women going through menopause will experience one or more menopause-related symptoms at varying effects impacting her quality of life.<sup>1,2</sup> Hormonal changes during this reproductive transition can lead to a multitude of physical or psychological symptoms, including vasomotor effects, genitourinary effects, mood changes, musculoskeletal discomfort, sleep disturbances, weight gain and decreased libido.<sup>1</sup> The average age of menopause in North America is 51, but symptoms can appear a few years prior to the final menstrual period.<sup>3,4</sup> Vasomotor symptoms, such as hot flashes and night sweats, have an average duration of 7.4 years where onset is during perimenopause, but effects are transient resolving in the post-menopausal period.<sup>5</sup> Other symptoms, such as genitourinary symptoms, are progressive and persistent through post-menopause.<sup>6</sup> Management of menopause symptoms may require a multimodal approach involving a combination of lifestyle changes, menopausal hormone therapy (MHT), or non-hormonal prescription medication. Current guidelines recommend MHT as first line treatment for moderate to severe menopausal symptoms.<sup>7-9</sup> However, women may opt for alternative options that may be perceived as less risky than MHT to manage their symptoms.<sup>10</sup>

In Canada, medical cannabis has been legal since 2001 and recreational cannabis became legalized in 2018. Health Canada reports that virtually half of Canadians have used cannabis at some point in their life.<sup>11</sup> Since legalization, cannabis use has increased especially within the midlife population.<sup>12</sup> Reports show that over 800,000 Canadians are now using non-medical cannabis for the management of their health, without medical advice.<sup>13</sup> Cannabis is being publicly marketed as a panacea for many health issues, including symptoms overlapping with menopause, potentially

influencing decisions made regarding its use.<sup>14</sup> Yet, the link between these marketed health claims and scientific evidence remains largely unanswered and needs to be explored.<sup>15</sup>

Cannabis may appear as an attractive option to manage menopause symptoms. Currently, no clinical guidelines exist for cannabis used for managing symptoms of menopause. A recent systematic review identified a paucity of research on the effect of cannabis on menopausal symptoms.<sup>16</sup> Yet, the increasing anecdotal use of cannabis for symptoms overlapping with menopause demands more attention to this area. In 2020, Health Canada released a public consultation report on cannabis health products showing Canadians were interested in using cannabis for menopause symptoms, especially involving sleep, mood or pain.<sup>17</sup> Still, it is unclear how many women are currently using cannabis to manage their menopause symptoms. The purpose of the current study is to characterize cannabis use patterns and perceptions in a population of midlife women. The study provides insight into current population cannabis use rates and reasons for use in order to establish a platform of knowledge and develop strategies to educate midlife women about cannabis and support clinicians providing menopause care.

## **2.2 METHODS**

### **2.2.1 Study Design**

This was a cross-sectional survey of adult women residing in Alberta, Canada. This survey was developed specifically for the first phase of a mixed methods research study that aimed to explore the experiences and perspectives around cannabis use in women. Ethics approval was granted for the mixed methods study by the Research Ethics Board at the University of Alberta (#Pro00100591). Results were reported using the CHERRIES checklist (Appendix A) for web-based survey data.<sup>18</sup>

## **2.2.2 Participants and Recruitment**

Inclusion criteria for participation was women, ages 35 and over, living in Alberta and able to complete an online survey in English-only. No maximum age was set a priori. Participants were recruited through online social media platforms (Facebook, Instagram, Twitter; see Appendix B for sample recruitment advertisements). A research-specific username and page was developed and managed by a research team member (KB) for each social media platform. Survey participants were sampled from the general population of social media users to maximize the number of survey responses collected online. Survey data collection took place over a two-month period from October to December 2020.

Women were offered the opportunity to participate in the survey through use of targeted advertisement campaigns and user-shared public social media posts on Facebook, Instagram and Twitter. The survey was open access and available in two ways: either through a direct URL link into the secure Qualtrics web application from a social media post, or through a targeted ad directing individuals to a study-specific webpage that then provided URL link access to the secure Qualtrics web page. These two methods of survey access were designed to abide by social media platform policies surrounding targeted ad development. Respondents first completed three screening questions for inclusion into the study (respondents had to identify as a woman, aged 35 or over, and resided in Alberta). Those eligible provided informed consent to participate electronically, then were able to complete the survey questions. Participation was voluntary and all survey participants were offered the chance to enter a raffle draw for 1 of 4 \$50 gift cards.

## **2.2.3 Survey Instrument**

### *2.2.3.1 Questionnaire*

The 50-item survey instrument (see Appendix C) developed by the study team was a web-based, self-administered questionnaire hosted on Qualtrics survey platform (Qualtrics Ltd.). The questionnaire was investigator-driven and, when possible, question development was informed by published literature<sup>19,20</sup> or Canadian national cannabis surveys.<sup>21,22</sup> Survey questions were closed-ended with pre-determined response categories in multiple-choice format and one open-ended question on general thoughts about the research topic. The survey was designed to take approximately 15 minutes to complete. Data collected included demographics, brief medical history, self-reported changes to menstrual cycle and menopause symptoms, cannabis use history and patterns (including frequency and duration of use, methods, and formulation type), and perspectives related to cannabis used for medical purposes. Demographic variables collected were age, region in Alberta, race/ethnicity, and education level.

Cannabis use questions included: current and past cannabis use, duration of use, reasons for use, access to medically prescribed cannabis, use for menopause symptoms, cannabis form, type (CBD/THC), frequency of use, product access, and reasons for stopping use (for past use). Current cannabis use was defined as use within the past 30-days. Past cannabis use included any previous use beyond the last 30 days. Characteristics for current or past cannabis use were assessed through adaptive questioning and survey branching logic. If respondents reported current cannabis use, they were asked about current cannabis use patterns and characteristics. If respondents did not report current cannabis use, they were asked about past cannabis use and related characteristics. Never users bypassed cannabis use questions and were directed to questions about perceptions and resources on cannabis use. A linked secondary survey form was used to gather contact information to participate in an optional raffle draw for an incentive for

participating in the survey. Survey participants also had the option to indicate interest to take part in follow-up, one on one interviews as part of the second phase of the mixed methods study.

### *2.2.3.2 Survey Validity and Reliability*

The initial survey questionnaire was assessed for content validity by clinical experts (n=4, 1 physician, 1 registered nurse, and 2 pharmacists). The survey was then pilot tested in a sample of women (n=10) reflecting the target audience of the survey. Cognitive interviews were carried out during the pilot test to evaluate survey tool for comprehensiveness, appropriateness and feasibility prior to administration in the public.<sup>23,24</sup> Survey questions were then revised and refined by members of the research team prior to use in the research study.

### **2.2.4 Data Analysis**

Summary statistics were used to describe the cohort of midlife women surveyed. Descriptive analysis of categorical variables was reported as frequencies (percentages) representing participant demographics, medical and menopause characteristics, and cannabis usage patterns and perceptions. Age as a continuous variable was reported as a median (interquartile range). Menopause stage was categorized by the researchers through response to pre-defined descriptions of changes in menstrual cycle with or without presence of menopause symptoms, adapted from Marlatt et al., (2018).<sup>19</sup> Women were categorized as: 'Pre-menopause' if they selected their periods were regular with no menopausal symptoms present; 'Perimenopause' if they selected their periods were irregular or regular with presence of menopausal symptoms; 'Post-menopause' if they selected it had been more than 12 months since their last menstrual period, regardless of menopause symptoms being present. Responses to 'Other' menopausal stage and the description provided by the survey respondents were reviewed individually and recategorized into the menopause stages defined above or left as 'Other' as

appropriate (Appendix D). Comparative analysis, using Chi-square test or Fisher-exact test for categorical variables and Kruskal-Wallis test for continuous variables as appropriate, were applied to test for assessment of between-group differences in (1) current cannabis versus non-users and (2) menopause stages for current cannabis use characteristics.

Logistic regression modelling on the subgroup of current cannabis users was conducted to explore possible predictors for cannabis use. Variables were included in univariable regression analysis if they indicated statistical significance in group comparisons between current cannabis users versus current non-users with a p-value of  $< 0.05$  (Table 2.2) or were identified by the research team as potential for clinical significance (for example, age and grouped menopause symptoms). Associations between current cannabis use and age, menopause stage, education, health status, smoking status and categorized menopause symptoms were tested individually using univariable logistic regressions, represented as univariable/unadjusted odds ratios (OR) with a 95% confidence interval (CI). For univariable analysis, individual symptoms of menopause were categorized into groups post-hoc based on interrelated clinical effects to streamline modelling. The following groupings were made: (1) vasomotor symptoms: hot flashes, night sweats; (2) genitourinary syndrome of menopause: vaginal dryness/itching, painful intercourse, low libido; (3) mood issues: depression, mood swings, irritability, anxiety, difficulty concentrating; (4) sleep issues: difficulty sleeping; and (5) muscle and joint aches.

A multivariable logistic regression model was then constructed using backward selection procedures by including all independent variables included in univariable analysis based on statistical significance ( $p < 0.05$ ) in group comparisons (Table 2.2) or clinical significance selected by the research team. Thus, multivariable regression analysis was adjusted for age, menopause stage, education, health status, and smoking status, while excluding menopause

symptoms grouped post hoc due to complexity of grouped variables. These associations were reported as multivariable/adjusted OR (95% CI). All statistical analyses were conducted using SAS version 9.4 (SAS Institute, Cary, NC) and the p-value for statistical significance was  $< 0.05$ .

Qualitative content analysis was used to analyze comments provided to a single open-ended question regarding the overall survey topic. Responses to this single question were manually coded independently by two coders (KB and RA) and compared, then organized into categories describing women's perceptions of cannabis used for menopause symptoms.

## **2.3 RESULTS**

### **2.3.1 Demographics and Clinical Characteristics**

A total of 1,761 survey responses were captured, where 10 were excluded through the initial screening questions and 266 did not progress past the informed consent page, for a total of 1,485 of the responses included in the final sample for analysis (see Figure 2.1). All data available from included respondents were used in analysis. Over 90% of respondents completed the full survey (92.7%).

The demographic and clinical characteristics of the survey participants are found in Table 2.1. The median age for respondents was 49 years (range 35 to 72 years). Majority of respondents identified as white (92.9%), had a post-secondary level of education (67.5%), resided in or around Edmonton (43.7%) or Calgary (30.8%), and had at least a moderate level of health literacy (95.4%). Overall, 64.9% of women indicated 'good' health status, 34.6% had no comorbidities, and 8.0% currently smoked cigarettes.

One-third of women (32.7%) were categorized in perimenopause, while 35.2% in postmenopause, and 12.6% had a hysterectomy and 4.3% had a bilateral oophorectomy. The most frequently reported menopause symptoms were difficulty with sleep (65.3%), difficulty with



concentration (49.2%), and anxiety (48.8%) (Table 2.1). Hormone therapy was used by 9.6% of women, and antidepressants for menopause symptoms by 20.2%. Women also reported managing menopausal symptoms with exercise and yoga (41.1%), mindfulness and meditation (24.2%), and changing diet (20.2%).

### **2.3.2 Characteristics of Cannabis Use**

Cannabis use in the past 30 days was reported by 33.6% of respondents and past cannabis use by an additional 32.3%, indicating that more than 65% had used cannabis at some point in their lives (Figure 2.1). Demographic and clinical characteristics were compared between current cannabis users and non-users in Table 2.2. Women currently using cannabis appeared to have lower education attainment ( $p < 0.0001$ ), a history of smoking cigarette smoking ( $p < 0.0001$ ), and a poorer health ( $p < 0.0001$ ). Also, current users were more likely to report sleep issues (73.5% vs. 62.8%,  $p < 0.0001$ ), depression (42.3% vs. 28.0%,  $p < 0.0001$ ), irritability (54.5% vs. 43.0%,  $p < 0.0001$ ), mood swings (44.7% vs. 32.2%,  $p < 0.0001$ ), anxiety (58.9% vs. 44.8%,  $p < 0.0001$ ), difficulty concentrating (57.7% vs. 46.0%,  $p < 0.0001$ ), muscle/joint achiness (52.7% vs. 39.1%,  $p < 0.0001$ ), and painful intercourse (14.8% vs. 10.4%,  $p = 0.01$ ). As well, current cannabis users were more likely to use natural health products or participate in mindfulness, meditation and cognitive behaviour therapy (CBT).

Characteristics of current cannabis users are reported in Table 2.3. Of the 499 current users, 33.9% reporting using cannabis for medical use only, while 41.1% indicated both medical and recreational use. Only 22.6% received cannabis medically authorized by a healthcare professional. Duration of cannabis use most commonly reported was 5 years or more (35.3%), while 26.5% of respondents indicated less than one year. Women were using cannabis once daily or more (once daily = 19.6%; 2-3 times daily = 16.0%; 4+ times daily = 7.0%). Most common

menopause symptoms that cannabis was used for included sleep difficulties (65.1%), anxiety (45.3%) and muscle and joint achiness (33.3%). Majority of women reported cannabis was helpful in managing their menopause symptoms (73.5%). Common forms of cannabis used were edibles (51.7%), oils (47.3%) and smoking (41.1%). Combination formulations of CBD:THC were reported by 57.9% of current cannabis users, while 36.1% used THC-only and 34.7% used CBD-only. Nearly two-thirds of respondents purchased cannabis product from in-person cannabis dispensaries (63.9%) and 39.1% purchased online. For the majority (58.1%), cannabis use habits did not change during the COVID-19 pandemic.

Differences in current cannabis use characteristics were identified when comparing by menopause stage (Table 2.3). Women in perimenopause and post-menopause were more likely to use cannabis for medical purposes ( $p < 0.0001$ ) and have a medical prescription for cannabis ( $p = 0.0344$ ), compared to pre-menopause. Women in post-menopause were more likely to use cannabis on a daily basis ( $p = 0.0002$ ) and report use for difficulty with sleeping ( $p < 0.0001$ ), muscle and joint achiness ( $p < 0.0001$ ), hot flashes ( $p = 0.0006$ ), difficulty with concentration ( $p = 0.0044$ ), night sweats ( $p = 0.0080$ ), and depression ( $p = 0.0084$ ), as compared to women in pre- and perimenopause.

Table 2.4 outlines the characteristics of past cannabis use in women ( $n = 479$ ). Of past users, majority reported they used cannabis for recreational purposes only (69.9%) and did not use it for the management of menopause symptoms (70.3%). Most past users accessed cannabis product from someone they knew (64.3%), and the most common form was smoked cannabis (64.3%). Reasons for stopping cannabis use were not wanting to use it anymore (35.5%), due to side effects (18.2%), or because it was illegal at the time (16.3%).

### **2.3.3 Predictors for Cannabis Use**

Factors associated with current cannabis use are shown in (Table 2.5). In the unadjusted analysis, current cannabis use was associated with a history of smoking ( $p < 0.0001$ ), poorer health status ( $p = 0.0001$ ) or education level of high school or less ( $p = 0.0142$ ). Cannabis use was also associated with the presence of difficulties with sleep ( $p < 0.0001$ ), mood symptoms ( $p < 0.0001$ ), muscle and joint achiness ( $p < 0.0001$ ) or GSM symptoms ( $p = 0.031$ ). Age and menopause stage were not found to be associated with current cannabis use in this sampled group.

In multivariable logistic regression modelling, smoking status and health status were significant predictors of current cannabis use (Table 2.6). Women who reported a history of cigarette smoking (current or past) were approximately 2.5 times more likely to report current cannabis use as compared to non-smokers (OR = 2.47, 95% CI 1.92-3.17,  $p < 0.0001$ ). Likewise, women who self-reported neutral or poor health were more likely to be currently using cannabis as compared to women who reported good health (OR = 1.49, 95% CI 1.13-1.96 and OR = 1.84, 95% CI 1.13-2.99, respectively with  $p = 0.0025$ ).

### **2.3.4 Perceptions on Cannabis for Medical Purposes**

Over one-third of women surveyed indicated they would use cannabis now that it is legalization in Canada (37.6%) (Table 2.7). Nearly 40% of all women surveyed expressed interest in using cannabis for menopause and 51.4% were interested in learning more. Though women indicated that internet searches (46.3%), family or friends (34.1%) or cannabis dispensaries (22.8%) were the most common sources of information, they desired to get information from physicians (50.2%), medical cannabis clinics (48.6%) and pharmacists (40.2%).

Over 35% of women provided comments to the open-ended question about taking cannabis for menopause symptoms. Examples of responders' comments are found in Table 2.8. A wide range of responses were captured, with the three most common categories including: (1) a need for more education and information on cannabis for menopause symptoms, (2) personal accounts of symptom improvement with cannabis, and (3) desire for menopause symptom relief while expressing interest in the potential role of cannabis in doing so.

## **2.4 DISCUSSION**

A third of midlife women in our survey reported currently using cannabis and more than 65% indicated using cannabis at some point in their life. Duration of cannabis use ranged within the sample, with over a quarter of women indicating use of less than one year. Frequency of cannabis use was variable; however, many midlife women are using cannabis products on a daily basis. Our survey showed that 75% of women currently used cannabis for medical purposes, yet only a fraction of this amount had cannabis medically authorized by a healthcare professional. The majority of current cannabis users indicated taking cannabis to manage menopause symptoms and found it helpful for their symptoms. To our knowledge, this is the first study to directly investigate cannabis use in midlife women during the menopause transition by characterizing cannabis use patterns and perceptions related to medical uses of cannabis.

Population estimates for Canada indicate approximately 1 in 5 women report recent use of cannabis, a significant increase since the 2018 Canadian legalization of recreational cannabis.<sup>12</sup> Moreover, it is the midlife population that has experienced the fastest growth in usage rates post-legalization. Despite our survey showing a higher prevalence in cannabis use in relation to the general population, which may be attributed with how women were recruited to participate, these results collectively provide a snapshot into usage patterns for this population

group. These data are also consistent with reports from Statistics Canada showing Canadian women are more frequently using cannabis for medical reasons than men.<sup>25</sup> Recently collected data within Canada shows that many Canadians are using cannabis medically without healthcare professional authorization.<sup>25, 26</sup> This is also reflected in the latest decrease in medical cannabis clients registered with licensed producers authorized by Health Canada, where at the time of legalization of recreational cannabis in 2018 there were 342,103 registered and, as of 2021, registrations have now fallen below 300,000.<sup>27, 28</sup> Legalization may be the reason for these trends by easing access to cannabis products.<sup>29</sup> In the present survey, cannabis was most commonly accessed through in-person cannabis stores followed by online sales, both of which are legal routes of product access in Alberta, Canada. The majority of women are currently not accessing cannabis through the medical route, despite using it for medical reasons.

Women may spend around one-third of their life within post-menopause and the majority of women will experience at least one symptom during the transitional period.<sup>1</sup> While some symptoms (like vasomotor symptoms) are transient, others (like genitourinary symptoms) are progressive and persistent well into post-menopause. In other cases, women suffer from symptoms in isolation, not attributing them to the menopause transition simply due to a lack of awareness and preparedness.<sup>30</sup> This can make it difficult for women to understand the cause of their symptoms and seek out appropriate care and management strategies. Anecdotal reports of cannabis use in menopause, backed by health claims made on the internet, may suggest menopause symptoms are an indication for cannabis. Yet, research on cannabis use in women, both in efficacy and safety, is limited and largely been focused on effects of cannabis use during pregnancy.<sup>31</sup> In other words, there is a paucity of research-based evidence on the effect of cannabis on menopause symptoms which would support such an indication.<sup>16, 31</sup> Our results

show women are using it for menopause symptoms and do find cannabis helpful. This suggests much of the use is self-managed and being driven by sharing of anecdotal evidence either through word-of-mouth or through media.

A consumer insights survey conducted within the United States showed women are actively introducing cannabis into their self-care as a means to gain personal control of their health, in areas such as menstruation, menopause and sexual health.<sup>32</sup> Moreover, Health Canada recently led a public consultation on a potential market for cannabis health products (CHPs) available to the public for purchase.<sup>17</sup> This implies Canadian regulatory bodies are exploring options for Canadians to self-manage minor ailments with cannabis products readily available for purchase with little to no healthcare professional involvement. Pain, mental health-related symptoms, and sleep issues were most commonly identified by Canadians as possible indications for CHPs and a subgroup population of interest identified was, in fact, women in menopause.<sup>17</sup> Interestingly, our survey showed the top three menopause symptoms women indicated cannabis use for were sleep, anxiety and muscle and joint pain. Despite sleep problems being the most common indication related to menopause cannabis was used for in this sample of midlife women surveyed, a recent review of literature shows mixed evidence on the efficacy of cannabis products on sleep-related conditions.<sup>33</sup> Yet, the concept of self-medicating with cannabis is already present in literature for a wide range of conditions and symptoms, including insomnia, pain, and psychiatric conditions,<sup>34</sup> which happen to overlap with symptoms experienced during the menopausal transition. Moreover, cannabis has been identified as a tool in self-managing other areas of women's health, including endometriosis symptoms<sup>35</sup> and pregnancy-related nausea and vomiting.<sup>36</sup> Also, historically it has been documented that cannabis has been used in women to manage dysmenorrhea, menorrhagia, childbirth and used as an aphrodisiac.<sup>37, 38</sup> It

appears the public will use cannabis for medical reasons despite a lack of evidence supporting its effectiveness and safety in use for many indications. Likewise, the present study provides evidence of midlife women using cannabis to self-medicate symptoms related to or overlapping with menopause.

An important finding from this survey was that women in perimenopause and post-menopause were more likely to use cannabis for medical purposes. This aligns with when symptoms of menopause would occur. Slavin, Farmer and Earleywine showed that women who used cannabis expected improvement of menopause symptoms such as muscle and joint pain, sleep problems, hot flashes, irritability, anxiety and depression.<sup>39</sup> While the present survey did not directly measure expectancies for symptom relief, women indicated which symptoms related to cannabis they used cannabis for. Moreover, not only were current cannabis users more likely to report experiencing menopause symptoms compared to non-users, the presence of menopause symptoms, specifically GSM symptoms, difficulty with sleep, mood symptoms, and muscle and joint aches, were found to be associated with cannabis use. These findings differ from recent findings from a survey in women veterans in the United States discovered over a quarter of women survey had ever-used cannabis and it was found to be associated with presence of hot flashes and night sweats (published in abstract form only as part of conference proceedings).<sup>40</sup> Another study examined menopause status, symptoms and drug use in a group of HIV-infected women, and found more women in post-menopause used cannabis compared to pre- or perimenopause and an association between hot flashes and cannabis use was identified.<sup>41</sup> While our survey results did not find an association between vasomotor symptoms and cannabis use, these mixed findings between studies signal a need for further research in the form of clinical

trials and more longitudinal study to determine the effect of cannabis use on menopause symptoms.

A history of smoking and overall poorer health were identified as predictors of current cannabis use in this sample of women after adjusted regression analysis. Correlations between cannabis use and cigarette smoking is well established in literature.<sup>26, 42</sup> Cannabis use has also been found to be associated with increased smoking initiation or relapse.<sup>43</sup> Clinically, this means women with a history of cigarette use should be queried about cannabis use, in both medical and recreational use. From these data, we are unable to distinguish if the root cause of poorer health is due to menopause symptoms, pre-existing comorbidities, adverse effects from cannabis use or other factors that may influence the general health of a woman. However, previous data from the Centre for Addiction and Mental Health (CAMH) Monitor annual survey conducted in Ontario, Canada, had similar findings where poorer health was reported in individuals using cannabis for therapeutic purposes.<sup>44</sup>

Despite MHT being effective and safe in most women, many continue to desire alternative methods of managing menopause symptoms beyond prescribed drug therapies.<sup>10, 45</sup> Use of complementary and alternative medicine (CAM) and compounded bioidentical hormone therapy (cBHT) is prevalent despite mixed evidence and lack of recommendations by clinical guidelines.<sup>8, 46, 47</sup> There are overlapping findings between our study and those related to alternative methods in managing menopause symptoms, such as CAM and cBHT. It has been shown women turn to media or internet when seeking information on these alternative strategies.<sup>45</sup> Despite trusting their healthcare provider's opinions and advice and deeming them reliable, women tend not to disclose use of alternative menopause management strategies to their health providers.<sup>45, 48</sup> Our survey highlighted women predominantly utilized the internet as their



main source of information on cannabis, yet desire to receive information from their healthcare providers (including physicians, pharmacists and medical cannabis clinics). This discrepancy may be attributed to a number of factors. The internet is now a source for easily shared information, resulting in an overabundance of freely made health claims on health products declared as safe and effective for menopause management.<sup>49</sup> Fear of stigmatization by health providers for using cannabis therapeutically has been previously described in literature.<sup>50</sup> This may cause reluctance in a woman to have this discussion with their healthcare providers and rely on self-management with cannabis products. Alternatively, studies have shown health professionals are hesitant to provide guidance on use of cannabis therapeutically citing a lack of published evidence on safety and efficacy, lack of product standardization and dosing, and unfamiliarity with cannabis used medically.<sup>51, 52</sup>

#### **2.4.1 Limitations**

To our knowledge, this study is the first to establish cannabis use patterns in a population of midlife women within a landscape of legalized recreational and medical cannabis. Yet, there were several limitations present. First, our recruitment strategy may have contained a level of selection bias off who saw and responded to the study recruitment advertisements on social media. For example, women using or who have interest in cannabis may have been more likely to take part in the study, thus overestimating the prevalence of cannabis use in our study population. However, recruitment ads were designed with the input of a marketing consultant to keep them broad on the topic of exploring management strategies in menopause, including cannabis, and providing explicit instructions that all women were invited to participate. Moreover, our survey results showed a large proportion of cannabis non-users suggesting this recruitment strategy was effective in providing a snapshot of the general midlife women

population in Alberta. Though it is important to note that our definition of ‘current’ use was constricted to within the last 30 days, which may have caused current, infrequent (less than monthly) users to being characterized as ‘past-users’. Secondly, we acknowledge the generalizability of the survey data may be limited due to underrepresentation of ethnic or racial minorities and variable legalization statuses of cannabis in other areas outside of Canada. Despite this, our data acknowledges and adds to the current body of literature indicating women are using alternative methods in managing menopause symptoms. Next, this study relied on self-reported data to categorize menopause stages and symptoms with no diagnostic or clinician assessment. All women were asked to report presence of menopause symptoms, which may have inadvertently introduced confounders and self-reporting bias. Still, the reported median age (and IQR) for survey responders fell within reported averages for the menopausal transition in North American women.<sup>3,4,53</sup> Lastly, it was beyond the scope of the study to objectively measure the effects of cannabis use on symptom control, nor can this data establish causality. Rather, this cross-sectional survey identifies cannabis usage patterns and provides insight on associations for generating further hypotheses to direct future investigations in this area.

## **2.5 CONCLUSION**

Midlife women are using cannabis for symptoms related to menopause. Findings from this survey established many women are using cannabis for medical reasons during the menopause transition without the oversight of health professionals. Information about cannabis was more frequently accessed through online searches and personal contacts. Further research is required to investigate the efficacy and safety of cannabis on menopause symptoms and foster the development of clinical resources for women to use in making informed decisions around cannabis for medical purposes.

## 2.6 REFERENCES

1. Minkin MJ. Menopause: Hormones, Lifestyle, and Optimizing Aging. *Obstetrics and Gynecology Clinics of North America*. 2019;46(3):501-14.
2. El Khoudary SR, Greendale G, Crawford SL, Avis NE, Brooks MM, Thurston RC, et al. The menopause transition and women's health at midlife: a progress report from the Study of Women's Health Across the Nation (SWAN). *Menopause*. 2019;26:1213-27.
3. Gold EB, Bromberger J, Crawford S, Samuels S, Greendale GA, Harlow SD, et al. Factors Associated with Age at Natural Menopause in a Multiethnic Sample of Midlife Women. *American Journal of Epidemiology*. 2001;153(9):865-74.
4. Costanian C, McCague H, Tamim H. Age at natural menopause and its associated factors in Canada: cross-sectional analyses from the Canadian Longitudinal Study on Aging. *Menopause*. 2018;25(3):265-72.
5. Avis NE, Crawford SL, Greendale G, Bromberger JT, Everson-Rose SA, Gold EB, et al. Duration of menopausal vasomotor symptoms over the menopause transition. *JAMA Intern Med*. 2015;175(4):531-9.
6. The North American Menopause Society. The 2020 genitourinary syndrome of menopause position statement of The North American Menopause Society. *Menopause*. 2020;27(9):976-92.
7. Baber RJ, Panay N, Fenton A, Group IMSW. 2016 IMS Recommendations on women's midlife health and menopause hormone therapy. *Climacteric*. 2016;19(2):109-50.
8. The North American Menopause Society. The 2017 hormone therapy position statement of The North American Menopause Society. *Menopause*. 2017;24(7):728-53.
9. Reid R, Abramson BL, Blake J, Desindes S, Dodin S, Johnston S, et al. Managing Menopause. *Journal of Obstetrics and Gynaecology Canada*. 2014;36(9):830-3.
10. Johnson A, Roberts L, Elkins G. Complementary and Alternative Medicine for Menopause. *J Evid Based Integr Med*. 2019;24:1-14.
11. Health Canada. Canadian Tobacco, Alcohol and Drugs (CTADS) Survey: 2017 detailed tables. 2018 [Available from: <https://www.canada.ca/en/health-canada/services/canadian-tobacco-alcohol-drugs-survey/2017-summary/2017-detailed-tables.html#t16>].
12. Rotermann M. Looking back from 2020, how cannabis use and related behaviours changed in Canada. *Health Reports*. 2021;32(no. 82-003-X):1-14.

13. Consumer Health Products Canada. Full Public Policy Position – Cannabis Regulation Ottawa, ON2019 [1-3]. Available from: <https://www.chpcanada.ca/wp-system/uploads/2019/11/Canabis-position-statement.2019.pdf>.
14. Bierut T, Krauss MJ, Sowles SJ, Cavazos-Rehg PA. Exploring Marijuana Advertising on Weedmaps, a Popular Online Directory. *Prev Sci.* 2017;18(2):183-92.
15. Bar-Lev Schleider L, Abuhasira R, Novack V. Medical cannabis: aligning use to evidence-based medicine approach. *Br J Clin Pharmacol.* 2018;84(11):2458-62.
16. Mejia-Gomez J, Phung N, Philippopoulos E, Murphy KE, Wolfman W. The impact of cannabis use on vasomotor symptoms, mood, insomnia and sexuality in perimenopausal and postmenopausal women: a systematic review. *Climacteric.* 2021:1-10.
17. Health Canada. Summary report: Consultation on potential market for health products containing cannabis that would not require practitioner oversight [Publication]. Government of Canada [updated 25 September 2020. Available from: <https://www.canada.ca/en/health-canada/services/publications/drugs-health-products/summary-report-consultation-potential-market-health-products-cannabis.html>.
18. Eysenbach G. Improving the quality of Web surveys: the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). *J Med Internet Res.* 2004;6(3):1-6.
19. Marlatt KL, Beyl RA, Redman LM. A qualitative assessment of health behaviors and experiences during menopause: A cross-sectional, observational study. *Maturitas.* 2018;116:36-42.
20. Chew LD, Bradley KA, Boyko EJ. Brief questions to identify patients with inadequate health literacy. *Family Medicine.* 2004;36(8):588-94.
21. Statistics Canada. National Cannabis Survey 2019 [cited 2019 January ]. Available from: [https://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&a=1&&lang=en&Item\\_Id=1256316](https://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&a=1&&lang=en&Item_Id=1256316).
22. Health Canada. The Canadian Cannabis Survey 2019 [updated 26 June 2019; cited 2019. Available from: <https://epe.lac-bac.gc.ca/100/200/301/pwgsc-tpsgc/por-ef/health/2019/130-18-e/report.pdf>.
23. Trenor JM, Miller MK, Gipson KG, editors. Utilization of a think-aloud protocol to cognitively validate a survey instrument identifying social capital resources of engineering undergraduates. 2011 ASEE Annual Conference & Exposition; 2011.

24. Tourangeau R. Cognitive sciences and survey methods. Washington, DC1984. 73-100 p.
25. Statistics Canada. National Cannabis Survey, second quarter 2019 2019 [Available from: <https://www150.statcan.gc.ca/n1/en/daily-quotidien/190502/dq190502a-eng.pdf?st=odG3aEbr>.
26. Turna J, Balodis I, Munn C, Van Ameringen M, Busse J, MacKillop J. Overlapping patterns of recreational and medical cannabis use in a large community sample of cannabis users. *Compr Psychiatry*. 2020;102:152188.
27. Health Canada. ARCHIVED – market data under the Access to Cannabis for Medical Purposes Regulations Government of Canada [updated 29 August 2019. Available from: <https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/licensed-producers/market-data.html>.
28. Health Canada. Data on cannabis for medical purposes Government of Canada: Health Canada; [updated 15 June 2021; cited 2021 15 July]. Available from: <https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/research-data/medical-purpose.html>.
29. Rotermann M. What has changed since cannabis was legalized? *Health Reports*. 2020;31(2):11-20.
30. Bremer E, Jallo N, Rodgers B, Kinser P, Dautovich N. Anxiety in Menopause: A Distinctly Different Syndrome? *The Journal for Nurse Practitioners*. 2019;15(5):374-8.
31. Corsi DJ, Murphy MSQ, Cook J. The Effects of Cannabis on Female Reproductive Health Across the Life Course. *Cannabis and Cannabinoid Research*. 2020;6(4):275-87.
32. BDS Analytics. Women Regularly Choose Cannabis to Take Control of Their Health [Website]. BDS Analytics2017 [updated 19 December 2017. Available from: <https://shop.bdsa.com/press-old/women-regularly-choose-cannabis-to-take-control-of-their-health/>.
33. Choi S, Huang BC, Gamaldo CE. Therapeutic Uses of Cannabis on Sleep Disorders and Related Conditions. *J Clin Neurophysiol*. 2020;37(1):39-49.
34. Osborn LA, Lauritsen KJ, Cross N, Davis AK, Rosenberg H, Bonadio F, et al. Self-Medication of Somatic and Psychiatric Conditions Using Botanical Marijuana. *J Psychoactive Drugs*. 2015;47(5):345-50.

35. Armour M, Sinclair J, Chalmers KJ, Smith CA. Self-management strategies amongst Australian women with endometriosis: a national online survey. *BMC Complement Altern Med*. 2019;19(1):17.
36. Westfall RE, Janssen PA, Lucas P, Capler R. Survey of medicinal cannabis use among childbearing women: patterns of its use in pregnancy and retroactive self-assessment of its efficacy against 'morning sickness'. *Complement Ther Clin Pract*. 2006;12(1):27-33.
37. Russo E. Cannabis Treatments in Obstetrics and Gynecology: A Historical Review. *Journal of Cannabis Therapeutics*. 2002;2(3-4):5-35.
38. Touw M. The religious and medicinal uses of Cannabis in China, India and Tibet. *J Psychoactive Drugs*. 1981;13(1):23-34.
39. Slavin MN, Farmer S, Earleywine M. Expectancy mediated effects of marijuana on menopause symptoms. *Addiction Research & Theory*. 2016;24(4):322-9.
40. Gibson C, Huang A, Maguen S, Inslicht S, Byers A, editors. Cannabis use for menopause symptom management among midlife women Veterans. 2020 Virtual Annual Meeting of the North American Menopause Society (NAMS); 2020; Virtual2020.
41. Fantry LE, Zhan M, Taylor GH, Sill AM, Flaws JA. Age of menopause and menopausal symptoms in HIV-infected women. *AIDS Patient Care & STDs*. 2005;19(11):703-11.
42. Ogborne AC, Smart RG, Adlaf E. Self-reported medical use of marijuana: a survey of the general population. *Canadian Medical Association Journal*. 2000;162:1685-6.
43. Weinberger AH, Delnevo CD, Wyka K, Gbedemah M, Lee J, Copeland J, et al. Cannabis Use Is Associated With Increased Risk of Cigarette Smoking Initiation, Persistence, and Relapse Among Adults in the United States. *Nicotine Tob Res*. 2020;22(8):1404-8.
44. Hamilton HA, Brands B, Ialomiteanu AR, Mann RE. Therapeutic use of cannabis: Prevalence and characteristics among adults in Ontario, Canada. *Can J Public Health*. 2017;108(3):e282-e7.
45. Posadzki P, Lee MS, Moon TW, Choi TY, Park TY, Ernst E. Prevalence of complementary and alternative medicine (CAM) use by menopausal women: a systematic review of surveys. *Maturitas*. 2013;75(1):34-43.
46. National Academies of Sciences E, and Medicine,. In: Jackson LM, Parker RM, Mattison DR, editors. *The Clinical Utility of Compounded Bioidentical Hormone Therapy: A Review of Safety, Effectiveness, and Use*. Washington (DC)2020.

47. Reid R, Abramson BL, Blake J, Desindes S, Dodin S, Johnston S, et al. Chapter 9: Managing Menopause Chapter 9 Complementary and Alternative Medicine (CAM). *Journal of Obstetrics and Gynaecology Canada*. 2014;36(9):S74-S80.
48. Ma J, Drieling R, Stafford RS. US women desire greater professional guidance on hormone and alternative therapies for menopause symptom management. *Menopause*. 2006;13(3):506-16.
49. Yuksel N, Treseng L, Malik B, Ogbogu U. Promotion and marketing of bioidentical hormone therapy on the internet: a content analysis of websites. *Menopause*. 2017;24(10):1129-35.
50. Bottorff JL, Bissell LJ, Balneaves LG, Oliffe JL, Capler NR, Buxton J. Perceptions of cannabis as a stigmatized medicine: a qualitative descriptive study. *Harm Reduction Journal*. 2013;10(1):1-10.
51. Ng JY, Gilotra K, Usman S, Chang Y, Busse JW. Attitudes toward medical cannabis among family physicians practising in Ontario, Canada: a qualitative research study. *CMAJ Open*. 2021;9(2):E342-E8.
52. Christensen VA, Nugent SM, Ayers CK, Morasco BJ, Kansagara D. A qualitative study of VHA clinicians' knowledge and perspectives on cannabis for medical purposes. *Fam Pract*. 2021;38(4):479-83.
53. Soares CN, Taylor V. Effects and Management of the Menopausal Transition in Women With Depression and Bipolar Disorder. *Journal of Clinical Psychiatry*. 2007;68:16-21.

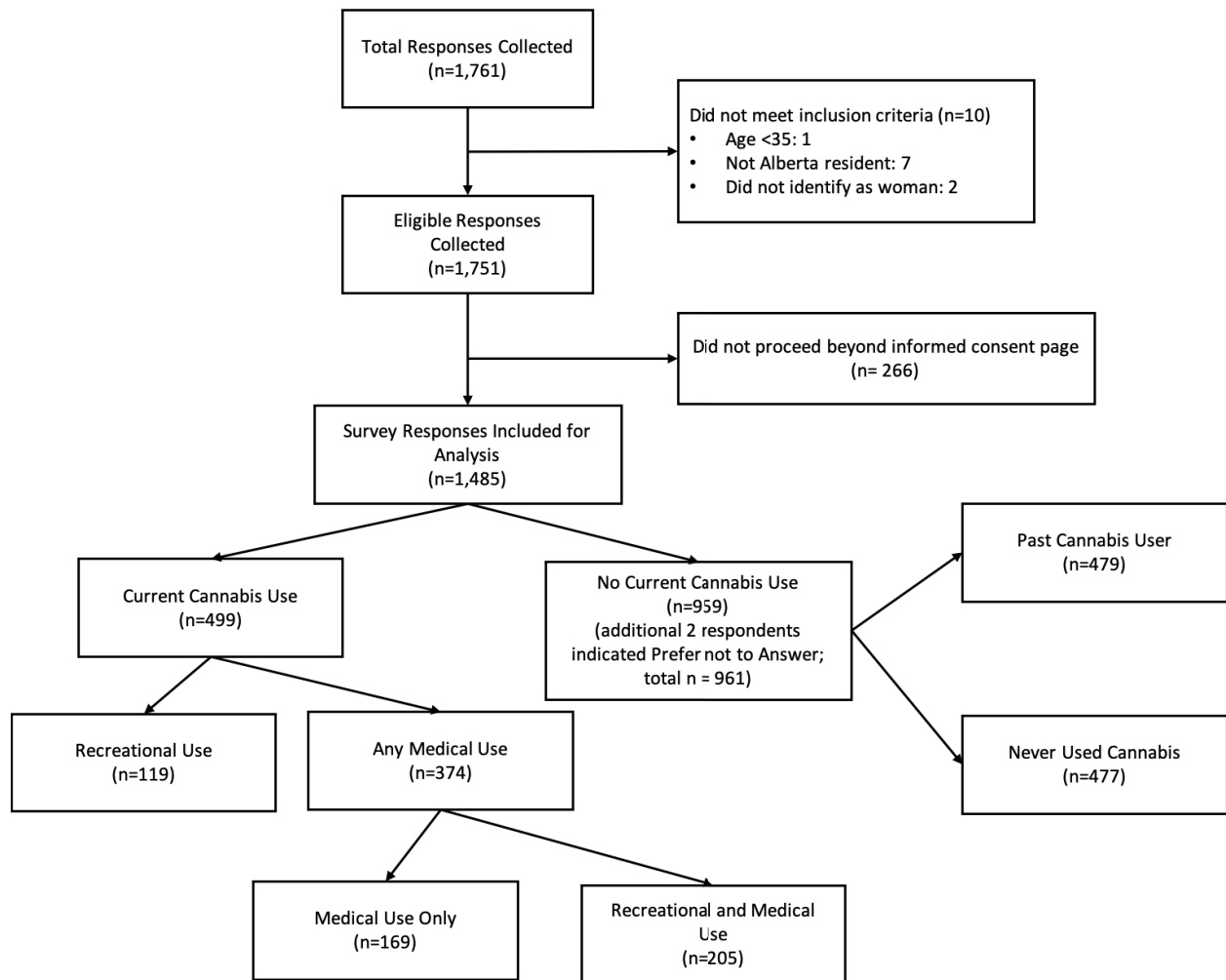


Figure 2.1. Survey participant flow-chart categorized based on history of cannabis use.



Table 2.1 Demographic and clinical characteristics of women surveyed

Characteristic	No. (%) of Participants (n=1,485)
Age, median (IQR)	49.0 (43.0-55.0)
Ethnicity, n (%)	
White	1379 (92.9)
Indigenous	54 (3.6)
Asian	27 (1.8)
South Asian	12 (0.8)
Black	8 (0.5)
Arabic	5 (0.3)
Other	35 (2.4)
Education Level, n (%)	
Less than high school	14 (0.9)
High school degree, equivalent	136 (9.2)
Post-secondary education	1003 (67.5)
Graduate education	304 (20.5)
Other	22 (1.5)
Region in Alberta, n (%)	
Edmonton and area	649 (43.7)
Calgary and area	457 (30.8)
Southern Alberta	138 (9.3)
Central Alberta	129 (8.7)
Northern Alberta	110 (7.4)
Medical Conditions, n (%)	
Migraines	384 (25.9)
High blood pressure	250 (16.8)
Respiratory disorders <sup>1</sup>	209 (14.1)
Diabetes	84 (5.7)
Other cancer <sup>2</sup>	73 (4.9)
Osteoporosis	42 (2.8)

Breast cancer	41 (2.8)
Neurological disease <sup>3</sup>	31 (2.1)
Heart disease <sup>4</sup>	26 (1.8)
Stroke	8 (0.5)
Other condition <sup>5</sup>	325 (21.9)
None	517 (34.8)
Smoking Status, n (%)	
Current	119 (8.0)
Past	524 (35.3)
Never	810 (54.5)
History of Hysterectomy, n (%)	187 (12.6)
History of Bilateral Oophorectomy, n (%)	64 (4.3)
Menopause Stage‡, n (%)	
Pre-Menopause	272 (18.3)
Perimenopause	486 (32.7)
Post-Menopause	522 (35.2)
Other	173 (11.6)
Menopause Symptoms (in past 30 days), n (%)	
Difficulty with sleeping	970 (65.3)
Difficulty with concentration or brain fog	730 (49.2)
Anxiety	724 (48.8)
Low sex drive or libido	691 (46.5)
Irritability	686 (46.2)
Muscle and joint aches	638 (43.0)
Night sweats	610 (41.1)
Hot flashes	567 (38.2)
Mood swings	532 (35.8)
Depression	480 (32.3)
Vaginal dryness or itching	455 (30.6)
Painful intercourse	174 (11.7)
Other	62 (4.2)
No symptoms	130 (8.8)
Prescription Medications for Menopause, n (%)	

Antidepressants		300 (20.2)
Hormone therapy		142 (9.6)
Combined hormonal contraceptive		105 (7.1)
Gabapentin or pregabalin		26 (1.8)
Clonidine		11 (0.7)
Other		76 (5.1)
None of the above		924 (62.2)
<b>Alternative Methods of Menopause Management (including CAM), n (%)</b>		
Exercise and yoga		611 (41.1)
Mindfulness or meditation		360 (24.2)
Changing diet		300 (20.2)
Cooling or avoiding triggers		293 (19.7)
Vaginal moisturizer or lubricant		261 (17.6)
Weight loss		236 (15.9)
Natural health products		185 (12.5)
Cognitive behavioural therapy (CBT)		87 (5.9)
Acupuncture		49 (3.3)
Other		80 (5.4)
None of the above		413 (27.8)
<b>Overall Health Status, n (%)</b>		
Good		964 (64.9)
Neutral		398 (26.8)
Poor		98 (6.6)
<b>Health Literacy<sup>†</sup>, n (%)</b>		
Q1. Problems understanding written information	Always	3 (0.2)
	Often	18 (1.2)
	Sometimes	118 (7.9)
	Occasionally	265 (17.8)
	Never	1018 (68.6)
Q2. Have someone help read hospital material	Always	3 (0.2)
	Often	11 (0.7)
	Sometimes	42 (2.8)

	Occasionally	120 (8.1)
	Never	1246 (83.9)
Q3. Confident filling out forms	Always	1257 (84.6)
	Often	128 (8.6)
	Sometimes	28 (1.9)
	Occasionally	4 (0.3)
	Never	6 (0.4)
Moderate to Adequate* (>6)		1417 (95.4)
Inadequate** (0-6)		1 (0.1)

*IQR* Interquartile range; *CAM* Complementary and alternative medicine

Medical Conditions:

<sup>1</sup>*Respiratory disorders* defined as: asthma, COPD

<sup>2</sup>*Other cancer* was self-reported by respondents, for example (but not limited to): cervical cancer, endometrial/uterine cancer, skin cancers, ovarian cancer, lymphoma

<sup>3</sup>*Neurological disease* defined as: multiple sclerosis, seizures

<sup>4</sup>*Heart disease* defined as: previous heart attack, atrial fibrillation, heart failure

<sup>5</sup>*Other condition* was self-reported by respondents, for example (but not limited to): autoimmune disorders/diseases, allergies, mental health illnesses, endometriosis, fibromyalgia, gastric reflux, gestational diabetes, thyroid diseases, hypercholesteremia, polycystic ovarian syndrome, uterine fibroids

‡Menopause Stage definitions:

*Pre-menopause*: regular period, no menopause symptoms

*Perimenopause*: irregular or regular period with menopause symptoms

*Post-menopause*: no period in 12 months or more, with or without menopause symptoms

†*Health Literacy* adapted from Chew et al. (2004) using three questions for detecting inadequate health literacy; Responses coded from 1-5; Q1 and Q2 responses coded *Always*=1 to *Never*=5, while Q3 reverse coded as *Always*=5 to *Never*=1; Sum of Q1, Q2, and Q3 response codes for each woman surveyed categorized into \* “*Moderate to Adequate*” if >6, or \*\* “*Inadequate*” if ≤ 6.

Table 2.2 Comparison of Demographic and Clinical Characteristics in Current Cannabis Users to Current Non-Users\*

Characteristic	Cannabis Use		p-value
	Current Users (n=499)	Non-Users (n=961)	
Age, median (IQR)	49.0 (42.0-55.0)	49.0 (43.0-55.0)	0.2661 <sup>1</sup>
Ethnicity, n (%)			
White	461 (92.4)	894 (93.0)	0.6518 <sup>2</sup>
Indigenous	26 (5.2)	28 (2.9)	0.0274 <sup>2</sup>
Asian	5 (1.0)	22 (2.3)	0.0833 <sup>2</sup>
South Asian	1 (0.2)	11 (1.1)	0.0687 <sup>3</sup>
Black	4 (0.8)	4 (0.4)	0.4566 <sup>3</sup>
Arabic	1 (0.2)	4 (0.4)	0.6663 <sup>3</sup>
Education level, n (%)			<0.0001 <sup>3</sup>
Less than high school	11 (2.2)	3 (0.3)	
High school degree, equivalent	52 (10.4)	80 (8.3)	
Post-secondary education	348 (69.7)	636 (66.2)	
Graduate education	75 (15.0)	226 (23.5)	
Other	10 (2.0)	14 (1.5)	
Region in Alberta, n (%)			0.6374 <sup>2</sup>
Northern Alberta	34 (6.8)	74 (7.7)	
Edmonton and area	233 (46.7)	406 (42.2)	
Central Alberta	41 (8.2)	86 (8.9)	
Calgary and area	149 (29.9)	300 (31.2)	
Southern Alberta	42 (8.4)	94 (9.8)	
Medical Conditions, n (%)			
High blood pressure	88 (17.6)	162 (16.9)	0.7147 <sup>2</sup>
Heart disease	12 (2.4)	14 (1.5)	0.1949 <sup>2</sup>
Stroke	1 (0.2)	7 (0.7)	0.2770 <sup>3</sup>
Diabetes	29 (5.8)	55 (5.7)	0.9489 <sup>2</sup>
Respiratory disorders	73 (14.6)	136 (14.2)	0.8109 <sup>2</sup>
Migraines	144 (28.9)	240 (25.0)	0.1124 <sup>2</sup>

Neurological disease	20 (4.0)	11 (1.1)	0.0003 <sup>2</sup>
Osteoporosis	19 (3.8)	23 (2.4)	0.1260 <sup>2</sup>
Breast cancer	15 (3.0)	26 (2.7)	0.7441 <sup>2</sup>
None	154 (30.9)	362 (37.7)	0.0095 <sup>2</sup>
Prefer not to answer	1 (0.2)	1 (0.1)	1.000 <sup>3</sup>
Smoking status, n (%)			<0.0001 <sup>3</sup>
Current	74 (14.8)	45 (4.7)	
Past	221 (44.3)	302 (31.5)	
Never	202 (40.5)	608 (63.3)	
History of Hysterectomy, n (%)	72 (14.4)	115 (12.0)	0.1818 <sup>2</sup>
History of Bilateral Oophorectomy, n (%)	28 (5.6)	36 (3.8)	0.0996 <sup>2</sup>
Menopause Stage, n (%)			0.6827 <sup>2</sup>
Pre-Menopause	96 (19.3)	175 (18.2)	
Perimenopause	160 (32.2)	326 (33.9)	
Post-Menopause	184 (37.0)	338 (35.2)	
Menopause Symptoms (in past 30 days), n (%)			
Hot flashes	200 (40.1)	367 (38.2)	0.4914 <sup>2</sup>
Night sweats	221 (44.3)	389 (40.5)	0.1663 <sup>2</sup>
Difficulty with sleeping	367 (73.5)	603 (62.8)	<0.0001 <sup>2</sup>
Depression	211 (42.3)	269 (28.0)	<0.0001 <sup>2</sup>
Irritability	272 (54.5)	413 (43.0)	<0.0001 <sup>2</sup>
Mood swings	223 (44.7)	309 (32.2)	<0.0001 <sup>2</sup>
Anxiety	294 (58.9)	430 (44.8)	<0.0001 <sup>2</sup>
Difficulty with concentration or brain fog	288 (57.7)	442 (46.0)	<0.0001 <sup>2</sup>
Muscle and joint achiness	263 (52.7)	375 (39.1)	<0.0001 <sup>2</sup>
Vaginal dryness or itching	172 (34.5)	283 (29.5)	0.0510 <sup>2</sup>
Painful intercourse	74 (14.8)	100 (10.4)	0.0136 <sup>2</sup>
Low sex drive or libido	252 (50.5)	438 (45.6)	0.0768 <sup>2</sup>
No symptoms	29 (5.8)	101 (10.5)	0.0027 <sup>2</sup>
Prescription Medications for Menopause, n (%)			

Hormone therapy		47 (9.4)	95 (9.9)	0.7888 <sup>2</sup>
Combined hormonal contraceptive		36 (7.2)	69 (7.2))	0.9688 <sup>2</sup>
Antidepressants		123 (24.6)	177 (18.4))	0.0047 <sup>2</sup>
Clonidine		7 (1.4)	4 (0.4)	0.0531 <sup>3</sup>
Gabapentin or pregabalin		12 (2.4)	14 (1.5)	0.1912 <sup>2</sup>
None of the above		290 (58.1)	633 (65.9)	0.0044 <sup>2</sup>
Alternative Methods of Menopause Management (CAM), n (%)				
Natural health products		84 (16.8)	101 (10.5)	0.0006 <sup>2</sup>
Vaginal moisturizer or lubricant		88 (17.6)	173 (18.0)	0.8341 <sup>2</sup>
Cooling or avoiding triggers		99 (19.8)	194 (20.2)	0.8446 <sup>2</sup>
Exercise and yoga		204 (40.9)	407 (42.4)	0.5444 <sup>2</sup>
Weight loss		77 (15.4)	159 (16.5)	0.5603 <sup>2</sup>
Acupuncture		20 (4.0)	29 (3.0)	0.3263 <sup>2</sup>
Mindfulness or meditation		149 (29.9)	211 (22.0)	0.0010 <sup>2</sup>
Cognitive behavioural therapy (CBT)		43 (8.6)	44 (4.6)	0.0021 <sup>2</sup>
Changing diet		106 (21.2)	194 (20.2)	0.6643 <sup>2</sup>
Other		42 (8.4)	38 (4.0)	0.0004 <sup>2</sup>
None of the above		138 (27.7)	274 (28.5)	0.6940 <sup>2</sup>
Overall Health Status, n (%)				<0.0001 <sup>3</sup>
Good		294 (58.9)	670 (69.7)	
Neutral		158 (31.7)	239 (24.9)	
Poor		46 (9.2)	52 (5.4)	
Prefer not to answer		1 (0.2)	0 (0.0)	
Health Literacy <sup>†</sup> , n (%)				
Q1. Problems understanding written information	Always (1)	2 (0.4)	1 (0.1)	0.0033 <sup>2</sup>
	Often (2)	10 (2.0)	8 (0.8)	
	Sometimes (3)	49 (9.8)	69 (7.2)	
	Occasionally (4)	107 (21.4)	158 (16.4)	
	Never (5)	320 (64.1)	698 (72.6)	

Q2. Have someone help read hospital material	Always (1)	2 (0.4)	1 (0.1)	0.0741 <sup>3</sup>
	Often (2)	4 (0.8)	7 (0.7)	
	Sometimes (3)	19 (3.8)	23 (2.4)	
	Occasionally (4)	51 (10.2)	69 (7.2)	
	Never (5)	413 (82.8)	833 (86.7)	
Q3. Confident filling out forms	Always (5)	416 (83.4)	841 (87.5)	0.0469 <sup>3</sup>
	Often (4)	55 (11.0)	73 (7.6)	
	Sometimes (3)	14 (2.8)	14 (1.5)	
	Occasionally (2)	1 (0.2)	3 (0.3)	
	Never (1)	3 (0.6)	3 (0.3)	
Inadequate** (0-6)		1 (0.2)	0 (0.0)	0.3434 <sup>3</sup>
Moderate to Adequate*** (>6)		486 (97.4)	931 (96.9)	

*IQR* Interquartile range; *CAM* Complementary and alternative medicine

\**Current cannabis user* defined as cannabis use within the last 30 days; *non-users* defined as having not used cannabis in the last 30 days.

‡Menopause Stage definitions:

*Pre-menopause*: regular period, no menopause symptoms

*Perimenopause*: irregular or regular period with menopause symptoms

*Post-menopause*: no period in 12 months or more, with or without menopause symptoms

†*Health Literacy* adapted from Chew et al. (2004) using three questions for detecting inadequate health literacy; Responses coded from 1-5; Q1 and Q2 responses coded *Always*=1 to *Never*=5, while Q3 reverse coded as *Always*=5 to *Never*=1; Sum of Q1, Q2, and Q3 response codes for each woman surveyed categorized into \* "*Moderate to Adequate*" if >6, or \*\* "*Inadequate*" if ≤ 6.

P-values:

<sup>1</sup> *Kruskal-Wallis p-value*

<sup>2</sup> *Chi-Square p-value*

<sup>3</sup> *Fisher Exact p-value*



Table 2.3 Characteristics of women currently using (within past 30 days) cannabis with group comparisons between menopause stage

Characteristic	Current Cannabis Users				p-value
	Total (n=499)	Pre- menopause (n=96)	Perimenopause (n=160)	Post- menopause (n=184)	
Reason for cannabis use, n (%)					
Recreational	119 (23.8)	41 (42.7)	38 (23.8)	29 (15.8)	<0.0001 <sup>1</sup>
Medical	169 (33.9)	21 (21.9)	52 (32.5)	73 (39.7)	
Both	205 (41.1)	32 (33.3)	70 (43.8)	80 (43.5)	
Medical prescription for medical cannabis access, n (%)	113 (22.6)	13 (13.5)	44 (27.5)	40 (21.7)	0.0344 <sup>1</sup>
Duration of current cannabis use, n (%)					
Less than 1 year	132 (26.5)	33 (34.4)	35 (21.9)	49 (26.6)	0.2543 <sup>1</sup>
1-2 years	105 (21.0)	20 (20.8)	39 (24.4)	31 (16.8)	
2-5 years	82 (16.4)	13 (13.5)	27 (16.9)	32 (17.4)	
Over 5 years	176 (35.3)	29 (30.2)	59 (36.9)	71 (38.6)	
Frequency of use, n (%)					
Only as needed	165 (33.1)	25 (26.0)	16 (10.0)	10 (5.4)	0.0002 <sup>1</sup>
Once daily	98 (19.6)	13 (13.5)	30 (18.8)	45 (24.5)	
2-3 times daily	80 (16.0)	14 (14.6)	28 (17.5)	32 (17.4)	
4+ times daily	35 (7.0)	5 (5.2)	8 (5.0)	17 (9.2)	
Recreational use only	60 (12.0)	25 (26.0)	16 (10.0)	10 (5.4)	
Other	59 (11.8)	8 (8.3)	25 (15.6)	18 (9.8)	
Use for management of following menopause symptoms, n (%)					
Difficulty with sleeping	325 (65.1)	46 (47.9)	102 (63.8)	138 (75.0)	<0.0001 <sup>1</sup>
Anxiety	226 (45.3)	37 (38.5)	80 (50.0)	87 (47.3)	0.1909 <sup>1</sup>
Muscle and joint achiness	166 (33.3)	13 (13.5)	54 (33.8)	82 (44.6)	<0.0001 <sup>1</sup>

Irritability	142 (28.5)	23 (24.0)	53 (33.1)	55 (29.9)	0.2989 <sup>1</sup>
Depression	124 (24.8)	15 (15.6)	38 (23.8)	59 (32.1)	0.0084 <sup>1</sup>
Mood swings	97 (19.4)	12 (12.5)	37 (23.1)	38 (20.7)	0.1086 <sup>1</sup>
Low sex drive or libido	52 (10.4)	6 (6.3)	23 (14.4)	17 (9.2)	0.0956 <sup>1</sup>
Difficulty with concentration or brain fog	46 (9.2)	5 (5.2)	10 (6.3)	28 (15.2)	0.0044 <sup>1</sup>
Night sweats	25 (5.0)	2 (2.1)	4 (2.5)	17 (9.2)	0.0080 <sup>2</sup>
Hot flashes	24 (4.8)	1 (1.0)	3 (1.9)	18 (9.8)	0.0006 <sup>2</sup>
Vaginal dryness or itching	7 (1.4)	0 (0)	3 (1.9)	4 (2.2)	0.4884 <sup>2</sup>
Painful intercourse	5 (1.0)	2 (2.1)	1 (0.6)	2 (1.1)	0.6344 <sup>2</sup>
Other	45 (9.0)	7 (7.3)	14 (8.8)	18 (9.8)	0.7752 <sup>1</sup>
None of the above	68 (13.6)	26 (27.1)	18 (11.3)	13 (7.1)	<0.0001 <sup>1</sup>
Helpful for menopause symptoms listed above, n (%)					
Yes	367 (73.5)	54 (56.3)	123 (76.9)	149 (81.0)	0.0567 <sup>2</sup>
No	10 (2.0)	2 (2.1)	2 (1.3)	5 (2.7)	
I do not know	2 (0.4)	22 (22.9)	26 (16.3)	24 (13.0)	
Cannabis product, n (%)					
Edibles	258 (51.7)	44 (45.8)	82 (51.3)	95 (51.6)	0.6023 <sup>1</sup>
Oils	236 (47.3)	39 (40.6)	82 (51.3)	88 (47.8)	0.2535 <sup>1</sup>
Smoke	205 (41.1)	37 (38.5)	77 (48.1)	73 (39.7)	0.2026 <sup>1</sup>
Vape	129 (25.9)	25 (26.0)	52 (32.5)	40 (21.7)	0.0834 <sup>1</sup>
Capsules	81 (16.2)	20 (20.8)	27 (16.9)	24 (13.0)	0.2395 <sup>1</sup>
Other	25 (5.0)	6 (6.3)	8 (5.0)	10 (5.4)	0.9133 <sup>1</sup>
Cannabis type, n (%)					
CBD/THC blends or combinations	289 (57.9)	59 (61.5)	100 (62.5)	97 (52.7)	0.0776 <sup>1</sup>
High THC (THC only or with low CBD)	180 (36.1)	26 (27.1)	63 (39.4)	65 (35.3)	0.1469 <sup>1</sup>

High CBD (CBD only or with low THC)	173 (34.7)	30 (31.3)	61 (38.1)	60 (32.6)	0.4185 <sup>1</sup>
I do not know	30 (6.0)	7 (7.3)	9 (5.6)	11 (6.0)	0.8395 <sup>1</sup>
Other	11 (2.2)	1 (1.0)	4 (2.5)	4 (2.2)	0.2204 <sup>1</sup>
Cannabis product access, n (%)					
In-person cannabis store	319 (63.9)	66 (68.8)	100 (62.5)	119 (64.7)	0.5973 <sup>1</sup>
Online cannabis store	195 (39.1)	42 (43.8)	74 (46.3)	56 (30.4)	0.0073 <sup>1</sup>
From someone you know (family, friend, someone else)	124 (24.8)	16 (16.7)	37 (23.1)	54 (29.3)	0.0538 <sup>1</sup>
Other	27 (5.4)	5 (5.2)	6 (3.8)	12 (6.5)	0.5078 <sup>1</sup>
Changes to use during COVID-19 pandemic*, n (%)					
No change	290 (58.1)	46 (47.9)	100 (62.5)	120 (65.2)	0.0187 <sup>1</sup>
Increased use	189 (37.9)	42 (43.8)	57 (35.6)	57 (31.0)	
Decreased use	16 (3.2)	7 (7.3)	3 (1.9)	5 (2.7)	
<i>CBD</i> cannabidiol; <i>THC</i> delta-9-tetrahydrocannabinol <sup>1</sup> Chi-Square test p-value <sup>2</sup> Fisher Exact test p-value *Note: no specific timeframe for COVID-19 pandemic defined to survey respondents					

Table 2.4 Characteristics of cannabis use women reporting previous use (beyond last 30 days)

Characteristic	Past Cannabis Users (n=479)
Reason for cannabis use, n (%)	
Recreational	335 (69.9)
Medical	66 (13.8)
Both	65 (13.6)
Prefer not to answer	4 (0.8)
Medical prescription for medical cannabis access, n (%)	37 (7.7)
Frequency of use, n (%)	
Only as needed	71 (14.8)
Once daily	36 (7.5)
2-3 times daily	20 (4.2)
4+ times daily	1 (0.2)
Only for recreational use	222 (46.3)
Other	108 (22.5)
Cannabis product form, n (%)	
Smoke	308 (64.3)
Edibles	131 (27.3)
Oils	116 (24.2)
Capsules	33 (6.9)
Vape	39 (8.1)
Other	16 (3.3)
Cannabis type, n (%)	
I do not know	240 (50.1)
CBD/THC blends or combinations	108 (22.5)
High CBD (CBD only or with low THC)	87 (18.2)
High THC (THC only or with low CBD)	36 (7.5)
Other	16 (3.3)

Prefer not to answer	3 (0.6)
Cannabis product access, n (%)	
From someone you know (family, friend, someone else)	308 (64.3)
In-person cannabis store	113 (23.6)
Online cannabis store	60 (12.5)
Other	18 (3.8)
Prefer not to answer	7 (1.5)
Use for management of following menopause symptoms, n (%)	
Difficulty with sleeping	82 (17.1)
Anxiety	60 (12.5)
Muscle and joint achiness	43 (9.0)
Depression	28 (5.8)
Irritability	22 (4.6)
Hot flashes	9 (1.9)
Mood swings	9 (1.9)
Night sweats	6 (1.3)
Difficulty with concentration or brain fog	6 (1.3)
Low sex drive or libido	4 (0.8)
Vaginal dryness or itching	1 (0.2)
Painful intercourse	0 (0.0)
Other	13 (2.7)
None of the above	337 (70.3)
Helpful for menopause symptoms listed above, n (%)	
Yes	66 (13.8)
No	54 (11.3)
I do not know	46 (9.6)
Does not apply to me	305 (63.7)

Reason for stopping, n (%)	
Did not want to use anymore	170 (35.5)
Due to side effects	87 (18.2)
Because it was illegal	78 (16.3)
It did not work or stopped working	58 (12.1)
Could not afford	29 (6.1)
Unable to find supply	5 (1.0)
Other <sup>†</sup>	120 (25.1)

*CBD* cannabidiol; *THC* delta-9-tetrahydrocannabinol;  
<sup>†</sup> *Reasons for stopping* = “Other” included: did not enjoy cannabis effects, stopped using once in adulthood, symptoms resolved, for pregnancy reasons, concerns of effects (drug interactions, long term effects, side effects), no reason to continue use, work-related reasons. Additional n=24 responders indicated very infrequent use with plans to continue using in the future.

Table. 2.5 Univariable logistic regression analysis for predictors of current cannabis use (n=499)

Variable	Univariable OR (95% CI)	p-value
Age		
<i>Per Year Increase</i>	0.99 (0.98-1.01)	0.2759
Menopause Stage		
<i>Pre-menopause</i>	Reference	
<i>Perimenopause</i>	0.9 (0.65-1.22)	
<i>Post-menopause</i>	0.99 (0.73-1.35)	0.6828
Smoking Status		
<i>Never</i>	Reference	
<i>Current/Past</i>	2.56 (2.05-3.2)	<.0001
Health Status		
<i>Good</i>	Reference	
<i>Neutral</i>	1.5 (1.18-1.92)	
<i>Poor</i>	2.02 (1.33-3.07)	0.0001
Education		
<i>High school or less</i>	Reference	
<i>Post-secondary or more</i>	0.65 (0.46-0.92)	0.0142
Menopause Symptoms‡		
<i>Symptoms not present</i>	Reference	
<i>Vasomotor symptoms</i>	1.09 (0.87-1.35)	0.467
<i>Genitourinary syndrome of menopause (GSM)</i>	1.28 (1.02-1.59)	0.031
<i>Difficulty with sleep</i>	1.98 (1.52-2.59)	<.0001
<i>Mood symptoms</i>	1.98 (1.52-2.59)	<.0001
<i>Muscle and joint achiness</i>	1.74 (1.4-2.16)	<.0001
<i>OR</i> odds ratio; <i>CI</i> confidence interval		
‡ For regression analysis, menopause symptoms from Table 2.1 were categorized into overlapping clinical effects as follows:		
<i>Vasomotor symptoms</i> =hot flashes, night sweats		
<i>Genitourinary syndrome of menopause</i> = vaginal dryness/itching, painful intercourse, low libido		
<i>Mood symptoms</i> = depression, mood swings, irritability, anxiety, difficulty concentrating		
<i>Difficulty with sleep</i>		
<i>Muscle and joint achiness</i>		

Table. 2.6 Multivariable logistic regression analysis for predictors of current cannabis use (n=499)

Variable	Multivariable OR* (95% CI)	p-value
Smoking Status		
<i>Never</i>	Reference	
<i>Current/Past</i>	2.47 (1.92-3.17)	<.0001
Health Status		
<i>Good</i>	Reference	
<i>Neutral</i>	1.49 (1.13-1.96)	
<i>Poor</i>	1.84 (1.13-2.99)	0.0025
<i>OR</i> odds ratio; <i>CI</i> confidence interval		
*Model adjusted for: age, menopause stage, health status, smoking status and education level. Only variables showing significant associations with current cannabis use in the adjusted model are outlined in the table above		



Table 2.7 Perceptions around cannabis for medical purposes

Responses	No. (%) of Participants (n=1,485)
Likelihood to use after legalization, n (%)	
Yes	559 (37.6)
No	445 (30.0)
Maybe	302 (20.3)
I do not know	2 (0.1)
Interest in using cannabis for menopause symptoms, n (%)	
Yes	575 (38.7)
No	254 (17.1)
Maybe	424 (28.6)
I do not know	181 (12.2)
Interest in learning about cannabis for managing menopause symptoms, n (%)	
Yes	763 (51.4)
No	236 (15.9)
Maybe	355 (23.9)
I do not know	81 (5.5)
Type of cannabis information desired, n (%)	
Indications	966 (65.1)
Type of cannabis (CBD vs. THC, different strains)	698 (47.0)
Drug interactions	621 (41.8)
Dosing	609 (41.0)
Side effects	554 (37.3)
Cannabis product forms	413 (27.8)
Other	41 (2.8)
Does not apply to me	232 (15.6)
Information sources accessed for cannabis use and products, n (%)	
Internet searches	687 (46.3)

Family or friends	506 (34.1)
In-person cannabis store	338 (22.8)
Physician	236 (15.9)
Medical cannabis clinic	232 (15.6)
Online cannabis store	159 (10.7)
Social media	98 (6.6)
Pharmacist	89 (6.0)
Other	68 (4.6)
Does not apply to me	307 (20.7)
Desired sources of information for cannabis, n (%)	
Physician	745 (50.2)
Medical cannabis clinic	722 (48.6)
Pharmacist	597 (40.2)
Internet searches	497 (33.5)
In-person cannabis store	301 (20.3)
Online cannabis store	228 (15.4)
Family or friends	183 (12.3)
Social media	114 (7.7)
Other	33 (2.2)
Does not apply to me	183 (12.3)
<i>CBD</i> cannabidiol; <i>THC</i> delta-9-tetrahydrocannabinol	

Table 2.8 Summary of top categories identified through content analysis of open-ended survey question\* (n=567) †

Category	n	Sample Quotes from Survey Participants
Education/seeking information	111	<p><i>“Have never taken it long enough to see if there were any results. Would like to know how long it would have to be taken to see results.” (#582)</i></p> <p><i>“Would be interested to know if there are studies suggesting that cannabis is useful in treating the symptoms of menopause and what side effects from cannabis use could be expected.” (#11)</i></p> <p><i>“This subject area is totally unknown to me. I haven't heard of treating menopause symptoms with cannabis products but would be interested in what research studies have shown.” (#326)</i></p>
Symptom improvement	86	<p><i>“CBD does help with the hot flashes and night sweats for me. Better than hormone replacement probably.” (#390)</i></p> <p><i>“I have had trouble sleeping since menopause. Tried many sleep aids and a balanced CBD/THC oil works wonders for me. I now sleep 6 hours without waking up.” (#26)</i></p> <p><i>“Using the CBD oil in the evening has helped with the night sweats, and somewhat with the insomnia, thinking of increasing a bit. It has also helped with the anxiety and the mood swings, they were terrible before, and now rarely happen. (#37)</i></p>
Desire for symptom relief with cannabis	31	<p><i>“I hate the night sweats so I would take cannabis at night if it helped stop the night sweats.” (#513)</i></p> <p><i>“I would potentially be interested in a form of cannabis for sleep. I just went thru a 9 month period of sleeplessness that was brutal and made it very challenging to function well.” (#225)</i></p> <p><i>“I struggle daily and nightly with severe and frequent hot flashes. I would be interested in using cannabis if it alleviated these symptoms of menopause.” (#575)</i></p>
<p>* Open-ended question taken from survey, located at the end of the survey:  <i>“Regardless of if you have or have not used cannabis, please use the space provided to type any comments you may have about taking cannabis for symptoms related to menopause.”</i></p> <p>† Total number of participants providing comment on open-ended question, n=655; total number of comments that underwent qualitative content analysis, n =567; n=88 excluded due to partial or lack of descriptive response with two-coder agreement to exclude</p>		

## CHAPTER 3. QUALITATIVE INTERVIEWS

### EXPLORING CANNABIS USE IN MENOPAUSE: A QUALITATIVE STUDY ON WOMEN'S

#### PERCEPTIONS AND EXPERIENCES

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## **Abstract**

**Objectives:** Over the course of the menopausal transition into post-menopause, the majority of women will experience one or more menopause symptoms, and many will seek out strategies in managing them. The aim of this study was to explore the experiences and perceptions of midlife women using cannabis for medical purposes coinciding with menopause symptom management.

**Methods:** Semi-structured, one-on-one interviews were conducted following the qualitative description method. This was part of the second phase of a mixed methods research study where women were purposefully selected from a sample of women (ages 35 and over, located in Alberta) surveyed during the first phase of the study if they reported current cannabis use and were in perimenopause or post-menopause. Interviews took place remotely by phone or Zoom videoconferencing, were audio-recorded and transcribed verbatim. Qualitative content analysis was applied to analyze the data collected.

**Results:** Twelve interviews were conducted between December 2020 and April 2021. Menopause was perceived as a complex experience women went through. Cannabis was described as a therapeutic agent, providing symptom relief and maintaining quality of life through the menopausal transition period. Women reported similarities in their menopause and cannabis use experiences in the lack of information available, limited role of healthcare providers, feelings of stigmatization and emphasis on self-educating. Women self-managed their cannabis use learning from their own experiences or the anecdotal sharing of others', accessed cannabis from a variety of medical and non-medical sources, relied on experimentation, and a range of different supports were described.

**Conclusion:** Midlife women provided a rich description of their experiences and perspectives on menopause and using cannabis to manage related symptoms. Healthcare providers should be

aware women are turning to self-management strategies to manage bothersome menopause symptoms. Understanding how and why midlife women use cannabis medically can provide insight for future research and the development of educational resources to support women in their menopausal care.

### 3.1 INTRODUCTION

Menopause defines the end of a woman's reproductive years and cessation of the menstrual cycle. Perimenopause is a transitional period that precedes menopause and is marked by hormonal fluctuations, menstrual cycle irregularities and menopausal symptoms.<sup>1</sup> The hallmark symptoms of menopause are vasomotor symptoms presenting as hot flashes and night sweats and occur in up to 80% of women.<sup>2</sup> Other symptoms include genitourinary symptoms, mood swings, anxiety, depression, difficulties concentrating, sleep disturbances, muscle and joint aches, weight gain, and decreased libido or sexual dysfunction.<sup>3,4</sup> Only about 20% of women can expect to go through menopause symptom-free.<sup>4</sup>

Menopause hormone therapy (MHT) remains the most effective treatment of vasomotor and genitourinary symptoms, with benefits also reported in improving sleep, mood, libido, musculoskeletal pain and menopause-related weight gain.<sup>3,5</sup> However, more than 50% of midlife women choose to use complementary and alternative medicine (CAM) to manage their menopause symptoms despite mixed evidence on efficacy and safety.<sup>6,7</sup> Many women also do not disclose the use of CAM to their healthcare provider (HCP).<sup>6,8,9</sup> CAM refers to the use of natural health products, mind-body practices and whole system alternative medicine.<sup>7</sup> The concept of cannabis as an alternative medicine is also increasing.

Following the 2018 legalization of recreational cannabis in Canada, the prevalence of cannabis use has increased especially within the midlife population.<sup>10</sup> A 2019 report showed over 800,000 Canadians are now using non-medical cannabis for the management of their health, without medical advice.<sup>11</sup> Many of the indications and health claims made for cannabis are largely anecdotal, through sharing of personal experiences or effective business marketing.<sup>12,13</sup> A Health Canada report indicated Canadians are interested in using cannabis for menopause

symptoms.<sup>14</sup> Though, the evidence supporting the use of cannabis for menopause symptoms is lacking.<sup>15</sup> Yet, an American consumer insights survey showed women are already using cannabis to manage menopause.<sup>16</sup> To our knowledge, there is no study that has explored the experiences of women using cannabis to manage their menopause symptoms. Understanding these experiences can provide insight to the reasons why women use cannabis, the factors that may influence their decisions, and the perceived effectiveness of cannabis as a therapeutic option in the management of menopause.

This research was the second phase of a mixed methods research (MMR) study aimed to explore the experiences and perspectives of midlife women on cannabis use. The first phase was a quantitative, cross-sectional survey characterizing cannabis use patterns and perceptions in a sample of midlife women residing in Alberta, Canada (see Chapter 2). The survey was conducted to determine whether midlife women are using cannabis to manage menopause symptoms. The purpose of the current study is to describe the experiences and perspectives of midlife women using cannabis for medical purposes, specifically for symptoms coinciding with menopause.

## **3.2 METHODS**

### **3.2.1 Study Design**

The qualitative description (QD) method was applied to conduct semi-structured, one-on-one interviews to explore participant experiences with cannabis used for medical purposes. QD applies naturalistic inquiry with phenomenological overtones to understand the participant's lived experience providing a rich, yet easy to understand, description of the "Who, What, Where, and Why".<sup>17</sup> QD also acknowledges the subjectivity of individual experiences in the real-world. This method is useful in health research studies where data is gathered directly from individuals experiencing the phenomenon, capturing their words to identify socially constructed health needs



and inform clinical care practices through an inductive process.<sup>18, 19</sup> Using an explanatory sequential approach in MMR, QD methodology was applied as part of the second phase to provide context behind the initial quantitative data collected through the survey.<sup>20</sup> Findings for the qualitative data were reported using the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist (Appendix G).<sup>21</sup> The MMR study was granted ethics approval by the Research Ethics Board at the University of Alberta (Pro#00100591).

### **3.2.2 Participants and Recruitment**

Interview participants were recruited from women who initially completed the online survey, between October and December 2020. Participants for the survey were recruited through social media platforms (Facebook, Instagram, Twitter) using targeted advertisements and user-shared public posts. To be included in the survey women had to be aged 35 and over and living in Alberta. At the end of the survey, all respondents were asked if they would like to participate in a follow-up interview. A total of 1,485 survey responses were collected for analysis, with 71.9% (n=1,067) agreeing to follow-up interviews and providing contact information. From the women who agreed to follow-up, interview participants were purposefully sampled based on menopause status (peri or post-menopause), current cannabis use (within the past 30 days), and able to converse in English. Women were categorized into menopause stages based on self-reported changes to the menstrual cycle, with or without the presence of menopause symptoms (see Appendix D). One of the authors (KB) contacted eligible participants until enough interviews were conducted to provide a rich, in-depth description of participant experiences complementary to the initial survey data collected on cannabis use patterns and perceptions in midlife women to address the overall research question and objectives.<sup>18, 22</sup> Before each interview, participants were emailed the study information letter and consent form outlining

study objectives, confidentiality, and consent procedures, which was reviewed together with the interviewer prior to the start of each interview.

### **3.2.3 Data Collection**

Between December 2020 and April 2021, data were collected through one-on-one, semi-structured interviews completed remotely either by telephone or via Zoom videoconferencing software, due to COVID-19 pandemic restrictions on in-person research. Prior to the start of each interview, the interviewer (KB) reviewed the study information letter and answered any questions the participant had about the study objectives or procedures. Each participant had a copy of the study information letter emailed to them. Since the interviews took place remotely, informed consent was obtained verbally from the participant to proceed with study participation, which was documented by hand by the interviewer. All participants provided consent to record the interview. The length of each interview ranged between 24 to 55 minutes, with an average of 42 minutes. Each interview was audio-recorded, transcribed verbatim using Otter.ai software, and then reviewed manually for accuracy. Participant anonymity was protected by removing any identifying information such as names or locations from the transcripts.

Participant characteristics were obtained from associated survey responses collected initially from the interviewed participants in phase one of the research study and cross-referenced with interview responses. The interview guide containing open-ended questions (see Appendix F) was developed and reviewed by the research team following the recommendations for qualitative interviews outlined by McGrath, Palmgren and Liljedahl.<sup>23</sup> Question domains were informed by the overall research objectives and initial survey data responses collected to address the following: menopause experience, role of cannabis in menopause, and cannabis experience (including beliefs, efficacy, safety, administration, and sources of information).

Recommendations made by Mahadeen, Halabi and Callister<sup>24</sup> and Hall et al.<sup>25</sup> for assessing perceptions of menopause were considered when developing the interview guide. The interview guide was revised as needed throughout the interview process in order to adjust wording of questions and capture a well-rounded description of experiences.

The same author and research team member (KB) conducted all of the one-on-one interviews and took field notes during and after the interviews. Another author (MQ) was present for two of the initial set of interviews to support notetaking, review quality and completeness of the interview guide in the field and enhance data interpretation during analysis. Interview recruitment ceased once KB, MQ, and NY agreed that data saturation was reached through repeating description of experiences between interviews.

### **3.2.4 Data Analysis**

Conventional qualitative content analysis was used to organize data into codes and then integrate coding into broader categories to inductively generate concepts described in women's experiences.<sup>26, 27</sup> Therefore, no theoretical framework was applied in the analysis of this data. Emergent codes directly from the data were determined by two coders (KB and MQ) initially through line-by-line reading of a transcript, followed by consensus between the two coders. A codebook was developed with emerging codes and categories. Focused coding with one coder (KB) was then completed for the remaining interview transcripts and category development was discussed throughout analysis with MQ and NY (See Appendix H for sample coding tree). Data analysis occurred concurrently with data collection and was triangulated with interviewer field notes. Interview transcripts were not returned to participants, nor were any additional follow-up interviews conducted. Qualitative data was coded manually and managed using NVivo (Release 1) software (QSR International).

### 3.2.5 Rigor and Reflexivity

Qualitative research acknowledges the social constructs of multiple realities and embraces the subjective nature of data collected.<sup>28</sup> Lincoln and Guba described four criteria for rigor to apply to methods of naturalistic inquiry in qualitative research to ensure trustworthiness in findings presented – credibility, transferability, dependability, and confirmability.<sup>29</sup>

Credibility was supported through researcher training and mentorship in qualitative methods, reflective journaling, and regular debriefing sessions, including review of the interview protocol and question guide throughout the data collection period. Transferability of the findings was ensured by providing a thick description of the study participants, including methods of sampling, and the context of the research environment. Dependability was maintained by outlining a detailed protocol for data collection, keeping track of amendments, applying a semi-structured interview guide to conduct interviews, interview transcript verification, and research team discussions in development of a codebook during analysis. Lastly, confirmability of the qualitative findings was established through triangulation of the interview data with survey data and interviewer notes and implementing reflexivity along the research process.

Reflexivity is the practise of continued researcher self-appraisal and acknowledgement of own subjectivity applied throughout the qualitative research process.<sup>30</sup> KB and NY are practicing pharmacists, while MQ also has a healthcare background with qualitative research expertise. Therefore, data collection and analysis were approached from the lens of a healthcare provider, applying a pragmatic approach to describing the experiences of midlife women in order to better understand an approach in managing menopause symptoms and identify current gaps in menopausal care. The individual interviews with women were conducted by female researchers with the data analyzed in an iterative process during collection with regular debriefing with the

research team to refine the interview guide, develop the codebook and address the overall research objectives.

### **3.3 RESULTS**

Characteristics of interview participants are listed in Table 3.1. A total of 28 women were contacted and invited to participate in follow-up interviews, from which 12 women consented and completed the interview process. Seven interviews were conducted by phone and 5 were conducted by Zoom. The participant's ages ranged from 45 to 63 years of age.

Women expressed their menopause experiences based on where they were in the menopause transition. Six women were categorized as in perimenopause, five post-menopausal, and one woman reported a history of hysterectomy. Majority of women had gone or were going through natural menopause. One woman provided outlook on her experiences with going through surgical menopause after receiving a bilateral oophorectomy related to a breast cancer diagnosis. The woman who had a hysterectomy, despite not exactly knowing what stage of menopause she may be at, was experiencing menopause symptoms that impacted her daily living. Each woman reported experiencing at least one menopause symptom at the time of interview. Symptoms described included hot flashes, night sweats, sleep issues, mood changes (including irritability, depression, anxiety), muscle and joint pain, vaginal dryness, decreased libido, difficulty concentrating, fatigue, and weight gain. Women described the use of an assortment of methods to manage these symptoms including menopause hormone therapy (oral or vaginal estrogen therapy), antidepressants, natural health products and vaginal lubricants.

All women interviewed indicated using cannabis for medical reasons and five of these women stated using cannabis recreationally as well. Four women reported having medical cannabis prescribed through a healthcare professional. A wide range of cannabis products were

used by the participants at varying frequencies of use, ranging from multiple times daily to taken as needed for symptom relief or recreational use.

Women's experiences were grouped into two overlapping domains from a construct of factors influencing the midlife woman (Figure 3.1). The two domains included women's: (1) Menopause Experience and (2) Cannabis Experience, with an overlapping aspect describing the 'Role of Cannabis in Menopause'.

### **3.3.1 Factors influencing a Midlife Woman**

This domain encapsulates biopsychosocial factors that were identified to influence a woman within her midlife. Women made reference to roles in their family, their careers, and in society as women when describing their experiences through menopause and with the use of cannabis. Moreover, factors associated with the process of aging, presence of pre-existing health conditions, and women's health (including fertility, gynecological issues, and female genetic predispositions) were brought forth in descriptions of their experiences. Therefore, the portrayal of the influences in a midlife woman's life was constructed to define key factors women shared as part of their experiences going through the menopause transition and with using cannabis. These factors may have had both positive, negative or neutral impact on the overall descriptions shared by women.

### **3.3.2 Perceptions of the Menopause Experience**

Women perceived menopause as a body and mind changing experience. One woman shared,

*'Your body changes, your clothes don't fit you the same and it gets a little weird.'* (P4)

These physical changes to the body were accompanied by shifting perspectives and priorities,

*'And, really, do you really care about cellulite? No, you care more that you have like high blood pressure, and you're like worried about having a stroke. Your cellulite, whatever. So really everything changes.'* (P4)

Women also described menopause as a time of changing responsibilities in their lives that impacted their personal outlook on life, their work or careers, and family life, especially with children growing up and the need to take care of aging parents.

The menopause transition was also portrayed as a dynamic process, where symptoms or even methods of managing those symptoms have changed over time. Symptoms endured at the start may not be the same as what was currently present. Some women reported worse menopause symptoms at the start, such as severe hot flashes or night sweats, which had either become more tolerable or self-resolved over time. While others reported progressively worsening symptoms with time, like with sleep or pain, or periodic mood fluctuations. Concern was also expressed over lack of libido and onset of vaginal discomfort.

When specifying which menopause symptoms women were experiencing, women stated some symptoms likely exacerbated other menopause symptoms, such as sleeplessness causing daytime anxiety and vice versa. Menopause symptoms were also described to overlap with other health concerns, which made it difficult for women to determine if what they felt was related to the menopause transition specifically or to a pre-existing comorbidity, injury or stress. One woman described the approach her medical team made in managing her health issues after a severe injury that appeared to overlap with menopause:

*'I had the accident with a brain injury and other injuries during menopause, it was very hard for us to tease out like, what were menopause symptoms... because I already had some of that stuff [symptoms overlapping with menopause] before. And so after my brain injury, it was like extreme... And so it's really hard to tease out and the doctors all agreed like they're like actually now we don't know, like, do you have severe post-concussion syndrome? Probably yes. Or which one of these are menopause symptoms. So it became really hard to distinguish them and we just decided we didn't care. Oh, it was just like treat the symptoms, whichever one is coming from. And it might be probably the post-concussion syndrome compounded by menopause. So it's like both of them interacting now.'* (P4)

Perceptions of menopause varied in this sample of women. Positive perspectives included acceptance, viewing their symptoms through humour, and feeling 'fairly fortunate' to have 'sailed through menopause compared to others' and not having a period anymore. One woman looked forward to menopause because not menstruating anymore had relieved her severe symptoms of endometriosis she had been experiencing since her 20s. Menopause was also perceived as a time of empowerment or liberation, where one woman explained,

*'...getting older as a woman is interesting, too. It's a little bit empowering, I guess... You know, it does make us more emotional, but maybe we also just give ourselves permission to be more emotional'.* (P7)



Alternatively, some associated menopause with a fear of aging, mentioning it marked the end of their reproductive years, found the menopausal transition period to be ‘dragged out’, or having possible negative impacts on their career. Compared to other women’s health concerns, women revealed menopause was less acknowledged as a life event and felt frustration towards HCP’s lack of interest as expressed by one woman,

*‘When you're young and you're going through puberty, like at school, you learn, right?... my doctor doesn't even ask me questions about menopause ever...And, like it goes on for a long time, like much longer than puberty and weird things are happening to your body’.*  
(P4)

Women attributed menopause to positive experiences such as opportunities to form communities with women, sharing experiences in unexpected ways and receiving support from family and friends. Others experienced more challenges during their experience with menopause, expressing poorer quality of life or describing instances of being dismissed by the medical community. Despite each woman having a unique menopause experience, a common sentiment identified was the overall lack of awareness or access to information resources about menopause available to women.

*‘There's a lot of variation from woman to woman and what they experience [during menopause], but at the same time, like to at least know what someone else is going through. So, if you happen to hit upon that you're like, “Oh, this is normal”, and you don't feel so like “What is wrong with me?” You know? So, it'd be comforting to know, “Oh, somebody*

*else went through that. Okay, cool.” I'm not completely, you know, either insane or dying. You know? Because sometimes you feel that way.’ (P6)*

### **3.3.3 Women’s Beliefs and Perceptions about Cannabis for Medical Purposes**

Women viewed cannabis as a form of medicine. They believed cannabis was a natural, low risk, and safe option compared to other pharmaceutical agents. Notably, two women made reference to cannabis being a better option compared to opioid drug therapy. Yet, cannabis was thought to be medically undervalued with reference to persisting stigmatization, despite legalization, and lack of research evidence backing its medical uses. Women expressed desire for further research on cannabis for medical uses in order to address this gap in evidence that was preventing its accepted use in modern medicine.

### **3.3.4 Women’s Cannabis Experience**

Emerging themes and categories depicted by women’s experiences with cannabis used for medical purposes are illustrated in summary figures found in Appendix I.

#### *3.3.4.1 Initiation and Management of Cannabis*

The experiences of women using cannabis were diverse in how women accessed cannabis, used cannabis products, and the information resources utilized, lacking or desired to make decisions surrounding cannabis for medical purposes. Women reported taking cannabis for a variety of symptoms that are common during menopause, including sleep problems, muscle and joint achiness, mood swings, anxiety, depression, low sexual libido. None of the women mentioned using cannabis to directly manage vasomotor symptoms, such as hot flashes or night sweats, or genitourinary symptoms. However, two women did say that managing their sleep problems with cannabis had indirectly decreased vasomotor symptoms where one woman stated,

*'I found very early on taking the cannabis that I was going from 10 or 12 times a night waking up with hot flashes to maybe two times a night. So right away I noticed the difference with the cannabis.'* (P5).

Despite a range of experiences, data on how women initiated and managed their cannabis use was organized into the following categories: self-management, level of support, product access, and experimentation. Self-management was described by women as 'taking matters into their own hands'. For the majority of women this meant either deciding to use cannabis on their own terms for symptoms that they were struggling to manage, having previously found conventional medications either ineffective or causing unwanted side effects, or experiencing dismissal from their HCPs for their symptoms. One woman shared:

*'Like when you go to talk to a doctor about your sleep issues. They're sort of like, "Well, you have to just tough it out. Oh, maybe you should do some..." What do they call that, "Sleep... Sleep hygiene." And I'm like, "Oh, my God. I have been doing sleep hygiene for years." And I get it. I have a set bedtime. I read before I go to bed. I don't have screen time. I don't drink coffee in the afternoon, right? Like I do all of that...So then people are going to take cannabis like I did, like, well, my husband and I did. I take matters into my own hands and figure out a way that I can get a decent night's sleep so I can function.'* (P2)

Women who reported a history of recreational cannabis use utilized those experiences to guide cannabis used for medical purposes. These women found their recreational use of cannabis

had shifted to medical use when they realized they were self-medicating their symptoms and experiencing relief. Four women had prior education (in the hemp/agriculture industry, nursing, veterinary sciences, or academic research) that provided them with access to information resources and the ability to understand scientific literature, guiding their decisions to use cannabis medically. Other women had tried several other treatment options with limited success prior to considering cannabis. Women commonly accessed online information or sought out the advice from people they knew, such as family and friends, to guide their cannabis use. Self-managing cannabis use also brought on a sense of control women had on their symptom management, which entailed choice in cannabis product selection, monitoring for side effects, and adjusting how much product they took based on how it made them feel, as one woman said,

*'I know what dose I'm taking, and I can control that.'* (P2)

On the other hand, the level of support women received from others was variable. Advice provided by family and friends on cannabis products and indications was common. Most women shared the importance of their spouse being involved in the decision-making process of how to take cannabis or even participating together in managing their own symptoms with cannabis. Whereas three women explained their adult children were their main supports, either providing the women with advice or purchasing cannabis product for them. Some women mentioned initial lack of acceptance by family members on them using cannabis to manage their medical problems, but by witnessing firsthand the benefits many family members shifted their outlook or even began using cannabis medically as well.

The role of HCPs was more varied. Most women shared their primary healthcare providers (HCPs) had little to no role in their use of cannabis for medical purposes. Some reported that they felt their HCPs were aware of their cannabis use but did not provide advice on cannabis because of the lack of research evidence to back health claims. A couple of women indicated their primary HCPs were supportive of their use cannabis for medical purposes as long as it remained well-tolerated and safe. Other women avoided telling their HCPs for fear of judgment, possible impact on future level of care received, or because of HCPs' lack of acknowledgement in differentiating medical uses of cannabis from recreational use. In general, women trusted their primary HCPs (including family doctors and community pharmacists), however many did not involve their HCPs when deciding to use cannabis for symptom management.

Women expressed a desire for HCPs to keep an open mind, ask about cannabis use by differentiating medical uses from recreational, and acknowledge cannabis as a therapeutic option providing guidance on information resources. Moreover, two women commented the need for more pharmacist involvement as the drug experts. The role of medical cannabis prescribing doctors and staff was differentiated from primary HCPs by the women. Level of care provided at medical cannabis clinics was deemed inconsistent; one woman was provided tailored, patient-specific recommendations from medical cannabis doctors and clinic staff with thorough follow-up, while others stated the clinics served to only provide continued access to medical cannabis with regular renewing of prescription authorization and little clinical advice on usage. Other supports that guided women's use of cannabis involved community groups or forums online, staff at cannabis dispensary stores, black-market dealers with experience selling cannabis product, or medical cannabis educators for those who had medical cannabis prescribed.

Cannabis product was accessed from an assortment of medical and non-medical sources. The majority of women got cannabis products from non-medical sources, either from in-person cannabis dispensaries, online cannabis stores, or from family and friends. Three women revealed the cannabis product they had used was given to them by someone who had it medically prescribed, including one woman sharing her spouse's medical cannabis. Some mentioned growing their own cannabis plants, but either were not able due to residential living restrictions or found purchasing ready-to-use cannabis product more convenient and effective. Four women reported currently using medical cannabis prescribed through a medical cannabis clinic and purchasing the prescribed product online through designated licensed producers. Multiple women had either considered or used medically prescribed cannabis but decided to use non-medical cannabis instead, for reasons including: convenience of purchasing legal product in stores, wide selection of legal cannabis products, cost differences, and less restrictive as compared to medical cannabis.

How women decided to use cannabis was driven by experimentation with different cannabis product forms, different cannabis strains, the amount taken, and the frequency of use. Women referred to this as a process of "trial and error" consisting of them trying cannabis product, self-monitoring for both intended and side effects, and documenting the effect. Additionally, some women tried stopping cannabis altogether only to find they felt better while taking it and resumed use again. Women also experimented with formulating their own products, mentioning methods of 'activating' cannabis bud to ingest or adding cannabis oil to bases that could be applied topically. Other women purchased a wide range of cannabis products in different strengths and forms to determine which had the best and preferred effect on them. Experimentation with prescribed medical cannabis was portrayed by a woman as her "own

clinical trial” where she listened to the recommendations provided by her medical cannabis doctor, further adding:

*‘I think this has been very interesting to me compared to other kinds of medications, where you're given a very precise prescription, a very precise dose of an exact thing. And then with the cannabis, it's like more like, do an experiment with it and try it out and keep track of how it works.’ (P4)*

#### 3.3.4.2 Personal Concerns with Cannabis Use

Several concerns were brought up by women when discussing cannabis used for medical purposes. With regards to duration of use, women wondered how long they would need to take cannabis. Some had already tried stopping only to feel worse, so the benefits of taking cannabis outweighed the risks. However, there was question if that risk would change with aging. Concerns of dependency and developing tolerance requiring higher doses or strengths of cannabis were highlighted as well. Also, women expressed concern on the effect cannabis had on their body and mind, citing cannabis’ potential effect on organ functioning, memory, and capacity. Reference was made to product forms that may harm organs, such as smoking cannabis bud and impairing lung functioning, or different cannabis strains impacting one’s capacity to complete tasks such as driving. Moreover, a couple of women highlighted concerns with drug tests and questioned if cannabis used medically would be impacted by workplace regulations.

*‘I was really concerned about driving and how it would affect if I would, you know, be considered inebriated and all that kind of stuff. So that's probably why I still very much so*

*only take it at night, just in case I drive somewhere particularly if it does, I mean, they explained to me clearly when I had the medical prescription was, you know, the difference between the THC and CBD like if it was just strictly CBD, you probably wouldn't ever [have cannabis] show up in your urine or be considered inebriated, which makes sense. But the THC might affect you that way. So I'm very conscientious about that. I make sure that if I take it earlier than what I usually do, then I don't have to like go out for anything.'*

*(P6)*

#### *3.3.4.3 Barriers to Cannabis Use*

Women across each interview described barriers they had experienced when using cannabis. The most common barrier was the perception of social stigma and lack of acceptance. Interview participants experiencing judgement not only from family, but friends, co-workers and healthcare professionals. This was one of the reasons why women kept private about their cannabis use and largely depended on themselves to self-manage. Legalization and growing societal acceptance were said to have shifted some of the stigma women felt, but women stressed the value of further education to the public and health professions, and research within the area of medical cannabis to address stigma.

A lack of information resources was also described as another barrier. Women referred to information resources as physical materials, online resources, HCPs, medical cannabis clinic staff, or personnel at cannabis stores. For online information, women determined good information from bad by searching for websites that had government or academic affiliations, references to scientific literature, or were recommended by their HCPs as credible sources for



medical information. Some women expressed challenges understanding or accessing scientific literature.

Another barrier described by women was the impact on travelling while using cannabis medically, especially with travel outside of Canada. Legalization had eased fear of travelling within Canada with cannabis product. Women expressed that travelling meant they would have to cope with symptoms returning, such as problems with sleep, mood or pain, for the duration of their stay out of country. As more areas in the world legalize cannabis, one woman commented on her experiences leaving her cannabis oil at home and buying cannabis product within a legalized state in the United States:

*'...there was a shop just up the street from where we were staying. So, my husband went because of course, I didn't take my oils with me because we didn't want to cross the border with them. That's the other thing sometimes too, right? Like when you travel, if you're traveling out of Canada, I don't want to get caught with some pot oil...' (P2)*

The cost of cannabis, both medical and non-medical, and lack of coverage for medical cannabis was repeatedly brought up. Those who had used cannabis prior legalization said legalized product was more expensive than black market product. Consistent product availability was a barrier when there were supply-demand issues or when women found a product they liked and then had issues finding it again. Additionally, the majority of women did not access cannabis through the medical route, despite using for medical reasons. They described many barriers as their reasons why, including medical cannabis being more expensive, the requirement to renew medical cannabis prescriptions regularly, questioning the reputability of medical cannabis clinics

and, overall, easier access to a wide range of non-medical cannabis products since legalization of recreational cannabis in Canada.

### **3.3.4 Role of Cannabis in Menopause**

Exploring the role of cannabis in menopause portrayed the expectations women set for using cannabis during this time in their lives. One woman stated,

*'Up until I was in menopause, I didn't appreciate that there were any medical benefits only because I wasn't experiencing any of those symptoms. I wasn't anxious. I was a good sleeper. I didn't have joint pain, all of those things. Only in the last three years.'* (P3).

Expectations for cannabis used for medical purposes relating to menopausal symptom management portrayed by women were organized into two main categories, symptom relief and maintaining quality of life. All of the women described using cannabis for relieving symptoms that coincided with menopause, taking them 'from uncontrollable to manageable'. There was general consensus that each cannabis product and strain did not have the same effect. This was evident when women described their process of selecting and trialing different cannabis products and describing their preferences. Despite this range of cannabis use experiences detailed by women, a commonality was the expectation of symptom relief.

*'I think cannabis in no way do I think it's a cure for diseases. But for me, it has helped my symptoms in menopause and other medical issues like tremendously ... complementing, you know, Western medicine and good diet and taking care of yourself. I found it [cannabis] has been really a godsend...'* (P10)

Women also expected to maintain their quality of life through the use of cannabis for medical purposes. One woman described, 'I think it [cannabis] allows you to be more you' (P5) as she made reference to cannabis helping in more areas than just symptom control, such as her productivity levels and positive influences on her relationship and intimacy with her husband. Many women mentioned the positive effects cannabis had on libido. Other factors discussed by women of how their cannabis contributed to maintenance of quality of life were cannabis as a coping mechanism for stressors, decreasing the consumption of alcohol, managing other comorbidities, and experiencing more feelings of being happier and more energized. Women shared that cannabis and menopause paired well together, where a woman explained,

*'I think maybe like that is the gift of ages ... You know, I've earned this. ... I didn't do it my whole life, because I was so busy being responsible. Now I'm just gonna try it. It's legal. Let's try it. I think it partners with that change and how you view yourself pretty well.'* (P7)

### **3.3.5 Recommendations for Other Midlife Women**

Women were provided the opportunity to share any advice they had to other women considering using cannabis for symptoms overlapping with menopause. Despite the majority accessing cannabis from non-medical sources with limited insight from their own HCPs, recommendations were to consult an HCP to have symptoms assessed and discuss cannabis as a therapeutic option. Some women stressed the importance of 'doing your own research', to try cannabis in a 'safe environment' to see its effect, but to avoid self-managing symptoms you were unsure the cause of. Women also indicated their own interest in opportunities to share their

experiences with other women, informing others of what worked and what did not. A general agreement was for women to 'go try it', especially if women are open-minded and have exhausted all other first line options.

*'I wouldn't want cannabis to just be like, "Oh, well, here's one more menopause treatment." When really women are going through this huge life transition where your body is completely changing in every single way, the way you feel about it, the way you think about your life, the way you feel. And cannabis is not an answer to that. Right? And so it might be a part of a puzzle of helping people feel a little better during this time, if it does help them.'* (P4)

### **3.4 DISCUSSION**

From the shared experiences and perspectives of midlife women in this qualitative study, women described cannabis as a therapeutic agent, providing symptom relief and maintaining their quality of life over the course of the menopausal transition period. However, these experiences were usually driven by women independently managing and experimenting with cannabis used for medical purposes. Many similarities were identified between women's menopause experience and cannabis use experience, including the lack of information available, limited role of primary care providers in guidance, experiencing stigmatization, and an emphasis on learning on their own. Women believed cannabis had a place in modern medicine, but the lack of research evidence compounded with pre-existing stigma was preventing its acceptance and utilization by HCPs and the general public. Therefore, women relied on learning from their own experiences or the anecdotal sharing of others' experiences.

Previous findings show that menopause symptoms can significantly affect women's daily personal, professional and social lives.<sup>31</sup> Our findings indicate that there are important internal and external factors related to health, relationships, and roles in society and are not independent from the experiences a midlife woman shares regarding menopause and cannabis use. Instead, these factors influence how a woman perceives these experiences. Additionally, in most women, menopause is a naturally occurring biological process related to aging. However, Western modern culture has increased recognition and report of symptoms attributed with menopause, leading some to perceive menopause as a condition requiring intervention.<sup>25</sup> In other words, menopause has been 'medicalized' in comparison to other cultures worldwide.<sup>25</sup> It is important to highlight this in the context of our study taking place in Canada, as how a woman chooses to manage menopause can be heavily influenced by sociocultural factors.

Women interviewed in this study largely felt unprepared to go through menopause. These findings are similar to those reported by Marlatt, Beyl and Redman, who found 65% of the women in their sample did not feel prepared for menopause, with symptomatic women being more likely to report lack of preparedness.<sup>32</sup> The women in our study were symptomatic, currently experiencing one or more menopause symptoms at the time of the interview. These women also expressed they did not receive adequate levels of medical support to manage their menopause symptoms. This may have been a driver to the self-medicating behaviours exhibited in this sample of midlife women, referred to as 'taking matters into their own hands' where the majority interviewed were using non-medical cannabis as a means to relieve their symptoms, with little insight from their HCPs. When examining the level of knowledge HCPs have on menopause, a survey within Australian health professionals showed nearly a third self-reported limited knowledge on menopause and hormonal therapies.<sup>33</sup> When asked about knowledge on

non-hormonal therapies to manage menopause, even more reported a gap in knowledge with approximately 50% of the survey sample reporting limited knowledge with a need to learn more.<sup>33</sup> With increasing average lifespans, women can now expect to spend a third of their life within post-menopause.<sup>4</sup> Therefore, not only is it imperative to foster the patient-HCP relationship within mature women's health but, also, ensure clinicians have access to clinical resources to provide care to this patient group in managing their menopause symptoms.

The women interviewed also reported a belief that, in general, menopause was less acknowledged compared to other women's health stages or related concerns and there was a lack of information resources readily available to women to learn about the menopause transition. Clinically in women's health, expenditure and resources have been shown to be allocated predominantly towards reproductive health and prenatal care, while significant gaps in care exist for postmenopausal woman.<sup>34</sup> Even when searching literature on studies that have examined cannabis use within women's health-related areas, a comparable trend was identified where the majority of published research studies investigating the effects of cannabis use in women have been within pregnancy and breastfeeding.<sup>35</sup> Meanwhile, cannabis research within menopause or midlife women remains limited.<sup>15, 35</sup> Based on the high number of women initially surveyed and indicating interest to participate in follow-up interviews, it can be implied midlife women are interested in opportunities to engage in learning about the menopausal transition and addressing the current gaps in care. Additionally, giving women access to health education on menopause has been shown to positively impact how women perceive menopause, even decreasing menopause symptoms scores.<sup>36</sup> This can in turn support opportunities to engage midlife women in communicating their health needs to their primary HCP.

Parallels can be drawn between midlife women's cannabis use experiences and other studies exploring alternative methods of managing menopause symptoms. For example, midlife women have reported using CAM and compounded bioidentical hormone therapy (cBHT) due to this perceived notion of these methods being effective, safe and natural alternatives to conventional drug therapies used in menopause management.<sup>8, 37-39</sup> Similar beliefs about cannabis were reported by women in the current study. This discourse of cannabis being natural, thus a safe option, extends beyond women in midlife. A study by Chang et al. reported pregnant women who were cannabis users perceived cannabis as safe and natural compared to other recreational and prescription medications.<sup>40</sup> Additionally, as was found in the current study, it has been shown that many HCPs are not aware of or have limited roles with women using CAM during menopause.<sup>6, 8</sup> Instead, the media is a common source of information on CAM use.<sup>6, 8</sup> The sense of control the women interviewed had experienced when using cannabis to self-manage their menopause symptoms mirrored the personal control women felt over their health when using alternative methods described by Seidl and Stewart.<sup>8</sup> From these data it is evident midlife women are seeking alternative methods they perceive as safe and effective, including cannabis, to self-manage their menopause symptoms.

Comparisons can also be drawn from the experiences women described during menopause and with using cannabis medically. Persisting ideas of stigma were repeatedly brought forth. Women felt dismissed by healthcare providers for their menopause symptoms and experienced aspects of ageism as related to growing older and ending their reproductive years, while also feeling judged by others for using cannabis. Regarded as the "deficiency disease" in the 1960s, menopause has longstanding sociocultural taboo attached to the subject, rooted in stigma against aging women.<sup>41</sup> Stigma against cannabis was attributed to pre-existing notions of

a ‘reefer madness society’, which make reference to the negative horror stories shared during the prohibition era of cannabis, then extending into much of the 20<sup>th</sup> century.<sup>42</sup> This illicit connotation for cannabis was found to be largely driven by media propaganda fueling stigma that remains to this day, also portraying cannabis as the ‘gateway drug’. A Canadian study by Bottorff et al. described cannabis as a ‘stigmatized medicine’ where users who took cannabis for medical reasons used strategies to mitigate the stigma they experienced such as keeping use private, using cannabis responsibly, and taking opportunities to educate others on the benefits of cannabis’ medical uses.<sup>43</sup> Similarities were found in our sample, despite a change in legalization of cannabis between this study and the one described by Bottorff et. al,<sup>43</sup> where some women opted to keep use private due fear of judgement, yet they voiced their desire to share their experiences with cannabis use to inform others on the possible benefits. Women interviewed in the current study also reported a lack of available resources and healthcare-related support for both menopause and cannabis yet expressed desire for increased HCP involvement and access to patient-friendly resources.

A clinical recommendation for HCPs that stems from these findings is to directly ask women about their perceptions of menopause, approaches to managing symptoms, and to inquire about cannabis use for medical purposes, differentiated from recreational uses. Mahadeen, Halabi and Callister outlined recommendations for HCPs assessing women in menopause based on their qualitative findings of women’s experiences,<sup>24</sup> which were adapted into the interview guide used in the present study and found to be an effective approach to identifying women’s experiences and unmet needs with menopause care. Moreover, efforts should be directed to developing easy-to-read, publicly available resources for midlife women to educate them on menopause, the different symptom management strategies and, also, provide guidance on how to



use cannabis for medical reasons safely. Addressing this existing gap in resources available with further research, education and conversation could also result in alleviating persisting stigma towards menopause and cannabis. As policies and clinical guidelines are updated in both menopause care and the use of cannabis medically, the role of cannabis should be carefully evaluated in midlife women.

### **3.4.1 Limitations**

This study addressed the current gap in knowledge existing on cannabis used for menopause symptom management. To our knowledge, this is the first study to go directly to midlife women to learn from their experiences so as to understand how and why cannabis is being used during menopause. Yet, several limitations should be recognized. The method of selecting interview participants through purposeful sampling may not accurately depict the full range of experiences women in menopause may have in using cannabis. Specifically, women had to have initially participated in the survey and indicate interest in follow-up interviewing, as well as be able to converse in English, to participate in this qualitative interview study. Still, the survey received higher than expected responses with a high number of survey participants indicating interest for follow-up from which interview participants were sampled from. Moreover, contradictory perceptions were identified within described menopause and cannabis use experiences, thus suggesting a breadth in experiences was captured from this sample of women interviewed. Another limitation is that these findings relied on self-reported data and experience sharing provided by women in the survey and interviews. This introduces a possibility of recall bias, affecting the accuracy of the data and interpretation. Other limitations that may have affected the rigor of the qualitative data was the participants did not have an opportunity for repeat interviews or to review the data collected in the form of member checking.

Despite these factors, research team debriefings supported credibility in the reported findings. Lastly, the approach used in this study does not establish if cannabis is effective in managing menopause symptoms nor are these findings intended to be generalized to the public. Instead, through the application of qualitative methods, this study explored the complexity of experiences and perspectives shared by midlife women at a time of cannabis legalization and increasing uptake in its use for medical purposes to establish a foundation of knowledge for future research and resource development on cannabis used for menopause symptoms.

### **3.5 CONCLUSION**

Despite a lack of evidence supporting the use of cannabis for this indication, midlife women are using cannabis to manage their menopause symptoms. Women perceived significant benefits in using cannabis during the menopausal transition in relieving symptoms and maintaining quality of life. Healthcare providers should be aware women are turning to self-management strategies to manage bothersome menopause symptoms. Insights gained provide direction for future research to further investigate the efficacy and safety of cannabis and develop education resources to support women in making informed decisions around managing menopause symptoms.

### 3.6 REFERENCES

1. Santoro N, Roeca C, Peters BA, Neal-Perry G. The Menopause Transition: Signs, Symptoms, and Management Options. *J Clin Endocrinol Metab.* 2021;106(1):1-15.
2. El Khoudary SR, Greendale G, Crawford SL, Avis NE, Brooks MM, Thurston RC, et al. The menopause transition and women's health at midlife: a progress report from the Study of Women's Health Across the Nation (SWAN). *Menopause.* 2019;26:1213-27.
3. The North American Menopause Society. The 2017 hormone therapy position statement of The North American Menopause Society. *Menopause.* 2017;24(7):728-53.
4. Minkin MJ. Menopause: Hormones, Lifestyle, and Optimizing Aging. *Obstetrics and Gynecology Clinics of North America.* 2019;46(3):501-14.
5. Soares CN, Taylor V. Effects and Management of the Menopausal Transition in Women With Depression and Bipolar Disorder. *Journal of Clinical Psychiatry.* 2007;68:16-21.
6. Posadzki P, Lee MS, Moon TW, Choi TY, Park TY, Ernst E. Prevalence of complementary and alternative medicine (CAM) use by menopausal women: a systematic review of surveys. *Maturitas.* 2013;75(1):34-43.
7. Johnson A, Roberts L, Elkins G. Complementary and Alternative Medicine for Menopause. *J Evid Based Integr Med.* 2019;24:1-14.
8. Seidl MM, Stewart DE. Alternative treatments for menopausal symptoms. Qualitative study of women's experiences. *Canadian Family Physician.* 1998;44:1271.
9. Ma J, Drieling R, Stafford RS. US women desire greater professional guidance on hormone and alternative therapies for menopause symptom management. *Menopause.* 2006;13(3):506-16.
10. Rotermann M. Looking back from 2020, how cannabis use and related behaviours changed in Canada. *Health Reports.* 2021;32(no. 82-003-X):1-14.
11. Consumer Health Products Canada. Full Public Policy Position – Cannabis Regulation Ottawa, ON2019 [1-3]. Available from: <https://www.chpcanada.ca/wp-system/uploads/2019/11/Canabis-position-statement.2019.pdf>.
12. Bierut T, Krauss MJ, Sowles SJ, Cavazos-Rehg PA. Exploring Marijuana Advertising on Weedmaps, a Popular Online Directory. *Prev Sci.* 2017;18(2):183-92.
13. Health Canada. Information for Health Care Professionals: Cannabis (marihuana, marijuana) and the cannabinoids Health Canada2018 [updated Oct 2018; cited 2021 18 May].

Available from: <https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/information-medical-practitioners/information-health-care-professionals-cannabis-cannabinoids.html#a4.0>.

14. Health Canada. Summary report: Consultation on potential market for health products containing cannabis that would not require practitioner oversight [Publication]. Government of Canada [updated 25 September 2020. Available from: <https://www.canada.ca/en/health-canada/services/publications/drugs-health-products/summary-report-consultation-potential-market-health-products-cannabis.html>.
15. Mejia-Gomez J, Phung N, Philippopoulos E, Murphy KE, Wolfman W. The impact of cannabis use on vasomotor symptoms, mood, insomnia and sexuality in perimenopausal and postmenopausal women: a systematic review. *Climacteric*. 2021;1-10.
16. BDS Analytics. Women Regularly Choose Cannabis to Take Control of Their Health [Website]. BDS Analytics2017 [updated 19 December 2017. Available from: <https://shop.bdsa.com/press-old/women-regularly-choose-cannabis-to-take-control-of-their-health/>.
17. Neergaard MA, Olesen F, Andersen RS, Sondergaard J. Qualitative description - the poor cousin of health research? *BMC Med Res Methodol*. 2009;9:52.
18. Bradshaw C, Atkinson S, Doody O. Employing a Qualitative Description Approach in Health Care Research. *Global Qualitative Nursing Research*. 2017;4:1-8.
19. Sullivan-Bolyai S, Bova C, Harper D. Developing and refining interventions in persons with health disparities: the use of qualitative description. *Nurs Outlook*. 2005;53(3):127-33.
20. Creswell JW, Plano Clark VL. *Designing and Conducting Mixed Methods Research*. 3rd ed. Los Angeles: SAGE Publications; 2017. 492 p.
21. Tong A, Sainsbury P, Craig J. Consolidate criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007;19(6):349-57.
22. Sandelowski M. Sample size in qualitative research. *Research in nursing & health*. 1995;18(2):179-83.
23. McGrath C, Palmgren PJ, Liljedahl M. Twelve tips for conducting qualitative research interviews. *Med Teach*. 2019;41(9):1002-6.

24. Mahadeen AI, Halabi JO, Callister LC. Menopause: a qualitative study of Jordanian women's perceptions. *International Nursing Review*. 2008;55:427-33.
25. Hall L, Callister LC, Berry JA, Matsumura G. Meanings of menopause: Cultural influences on perception and management of menopause. *Journal of Holistic Nursing*. 2007;25(2):106-18.
26. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res*. 2005;15(9):1277-88.
27. Erlingsson C, Brysiewicz P. A hands-on guide to doing content analysis. *Afr J Emerg Med*. 2017;7(3):93-9.
28. Lincoln YS, Guba EG. But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New directions for program evaluation*. 1986;1986(30):73-84.
29. Lincoln YS, Guba EG. *Naturalistic inquiry*: sage; 1985.
30. Berger R. Now I see it, now I don't: researcher's position and reflexivity in qualitative research. *Qualitative Research*. 2013;15(2):219-34.
31. Simon JA, Reape KZ. Understanding the menopausal experiences of professional women. *Menopause*. 2009;16(1):73-6.
32. Marlatt KL, Beyl RA, Redman LM. A qualitative assessment of health behaviors and experiences during menopause: A cross-sectional, observational study. *Maturitas*. 2018;116:36-42.
33. Yeganeh L, Boyle J, Teede H, Vincent A. Knowledge and attitudes of health professionals regarding menopausal hormone therapies. *Climacteric*. 2017;20(4):348-55.
34. Owens G. Gender differences in health care expenditures, resource utilization, and quality of care. *Journal of Managed Care Pharmacy*. 2008;14(3):2-6.
35. Corsi DJ, Murphy MSQ, Cook J. The Effects of Cannabis on Female Reproductive Health Across the Life Course. *Cannabis and Cannabinoid Research*. 2020;6(4):275-87.
36. Koyuncu T, Unsal A, Arslantas D. Evaluation of the effectiveness of health education on menopause symptoms and knowledge and attitude in terms of menopause. *Journal of epidemiology and global health*. 2018;8(1-2):8.
37. Yuksel N, Treseng L, Malik B, Ogbogu U. Promotion and marketing of bioidentical hormone therapy on the internet: a content analysis of websites. *Menopause*. 2017;24(10):1129-35.

38. Fishman JR, Flatt MA, Settersten RA, Jr. Bioidentical hormones, menopausal women, and the lure of the "natural" in U.S. anti-aging medicine. *Soc Sci Med.* 2015;132:79-87.
39. Thompson JJ, Ritenbaugh C, Nichter M. Why women choose compounded bioidentical hormone therapy: lessons from a qualitative study of menopausal decision-making. *BMC Womens Health.* 2017;17(97):1-18.
40. Chang JC, Tarr JA, Holland CL, De Genna NM, Richardson GA, Rodriguez KL, et al. Beliefs and attitudes regarding prenatal marijuana use: Perspectives of pregnant women who report use. *Drug Alcohol Depend.* 2019;196:14-20.
41. McCrea FB. The politics of menopause: The "discovery" of a deficiency disease. *Social problems.* 1983;31(1):111-23.
42. Stringer RJ, Maggard SR. Reefer Madness to Marijuana Legalization. *Journal of Drug Issues.* 2016;46(4):428-45.
43. Bottorff JL, Bissell LJ, Balneaves LG, Oliffe JL, Capler NR, Buxton J. Perceptions of cannabis as a stigmatized medicine: a qualitative descriptive study. *Harm Reduction Journal.* 2013;10(1):1-10.

Table 3.1 Overview of participant characteristics\*

ID #	Age	Menopause Stage**	Reason for Cannabis Use	Medical Cannabis Prescription***	Description of Cannabis	Frequency of Use
P1	45	Post-menopause (Surgical <sup>1</sup> )	Recreational and Medical	No	Smoke bud, CBD bath salts	4 or more times daily
P2	48	Perimenopause	Medical	No	Oil, capsules	Once daily
P3	61	Post-menopause	Recreational and Medical	No	Smoke bud, oils	As needed
P4	53	Perimenopause	Medical	Yes	Capsules, edibles	2 to 3 times daily
P5	57	Post-menopause	Medical	Yes	Oils, capsules <sup>4</sup>	Once daily
P6	49	Perimenopause	Recreational and Medical	No <sup>3</sup>	Oils Sometimes edible or vape	As needed
P7	48	Other (Hysterectomy <sup>2</sup> )	Medical	Yes	Oils	Daily
P8	63	Post-menopause	Medical	No	Capsules	As needed
P9	58	Perimenopause	Recreational and Medical	No	Smoke bud, oils, edibles,	Once daily
P10	46	Perimenopause	Recreational and Medical	No	Smoke bud, vape, topical	As needed
P11	52	Perimenopause	Medical	No	Smoke bud, oils, edibles, topical cream	As needed Topical - daily
P12	51	Post-menopause	Medical	Yes	Capsules <sup>5</sup> , self-made topical <sup>5</sup>	As needed

\*Participant characteristics gathered from survey data and cross-referenced with interview responses; discrepancies outlined.

\*\*Menopause Stage Definitions:

*Perimenopause*: irregular or regular menstrual periods with menopause symptoms

*Post-menopause*: no period in 12 months or more, with or without menopause symptoms

\*\*\*In Canada, medical cannabis is prescribed by an approved healthcare professional (medical doctor or nurse practitioner) authorizing a daily quantity of cannabis (grams/day) for a specified period of use (up to 1 year). Patients then purchase cannabis product from designated federally licensed sellers (approved by Health Canada) or may apply to produce/grow their own cannabis product for use.

<sup>1</sup>Participant reported history of bilateral oophorectomy

<sup>2</sup>Unable to categorize participant within perimenopause or post-menopause due to report of hysterectomy

<sup>3</sup>Survey response indicated “Yes” to medical cannabis authorization, however P6 reported her authorization had since expired during the interview and access of cannabis product was through non-medical source.

<sup>4</sup>Participant purchased whole cannabis bud, which she processed and ground to put into capsule form.

<sup>5</sup>Participant purchased cannabis oil to fill own capsules or mix with coconut oil to make own topical product.

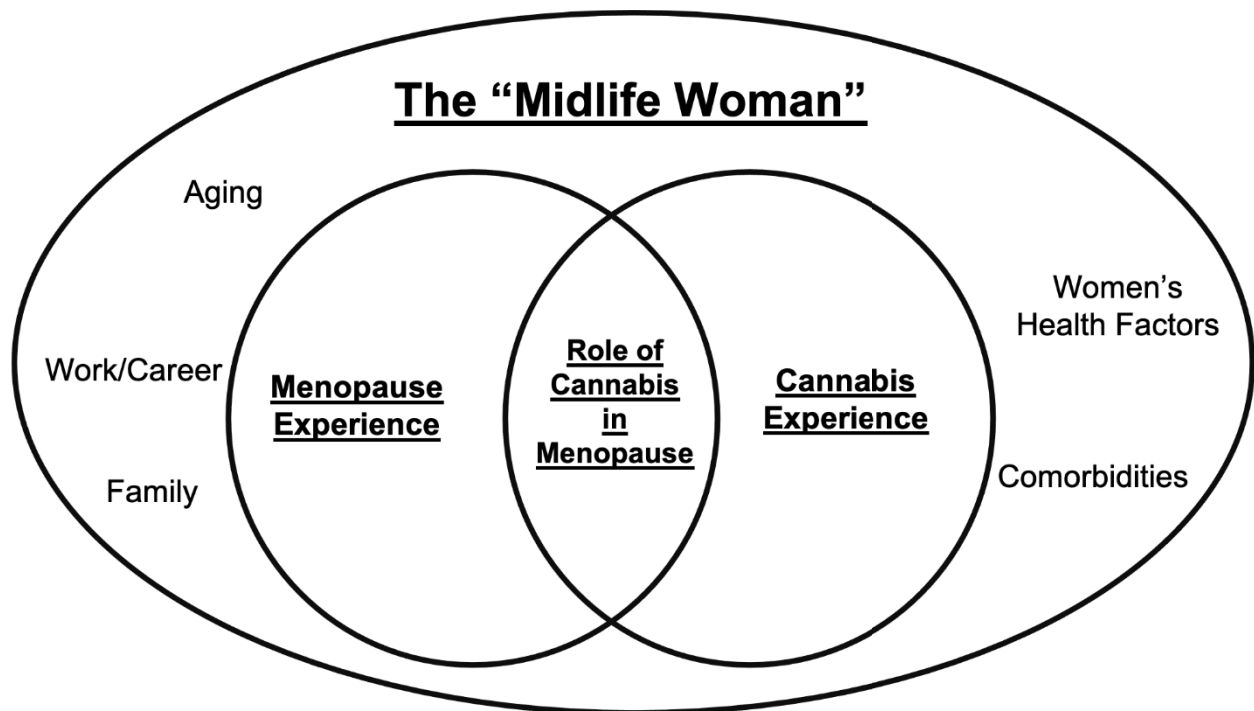


Figure. 3.1 Construct of factors influencing the “Midlife Woman with resulting impact on menopause and cannabis experiences



## **CHAPTER 4. SUMMARY**

### **4.1 GENERAL DISCUSSION**

Menopause is a life transition that, despite being a universal event that women go through as they age, is a unique experience to each woman. The end of a woman's reproductive years not only marks the end of a regular menstrual cycle but can also bring about many biopsychosocial changes to her life. These include the onset of menopause symptoms, changes to pre-existing symptoms and comorbidities, influences on how a woman perceives herself as she ages, and how she interacts with others. Therefore, menopause is a multifactorial, complex period in a woman's life also impacting how a woman chooses to manage her symptoms with menopause.

Menopause symptoms can present as physical and emotional symptoms, having significant impact on a woman's personal, professional and social life.<sup>1</sup> The majority of women will experience at least one menopause symptom, ranging from the classic vasomotor symptoms, genitourinary symptoms, mood swings, depression, anxiety, sleep disturbances, muscle and joint pain, and weight gain.<sup>2,3</sup> Yet there is great diversity in the approach to managing menopause, bound to social and cultural contexts and personal perceptions of menopause symptoms during this time period.<sup>4,5</sup> Women can decide to use a range of prescription drug therapies, natural health products, complementary and alternative medicine (CAM) approaches, or lifestyle changes to manage symptoms related to menopause. Since legalization of cannabis in Canada, use of cannabis has increased and more Canadians are using non-medical cannabis to manage their health.<sup>6,7</sup> With growing interest in using cannabis for medical purposes, it is important to know if midlife women are using cannabis to manage their menopause symptoms and understand the factors associated with cannabis use for this indication. The aim of this thesis work was to explore midlife women's experiences and perceptions with using cannabis during menopause.

By applying a two-phase, explanatory sequential, mixed methods research design, we first determined if midlife women were using cannabis by conducting a cross-sectional survey. Then, qualitative interviews were completed on a sample of surveyed women to further explore their experiences and perceptions with using cannabis for medical reasons to provide context to the initial quantitative findings. By going directly to women, these findings will establish a platform of knowledge on cannabis use in menopause grounded in women's own experiences to direct future research and assist in the development of clinical resources to support midlife women and healthcare providers.

#### **4.1.1 Cannabis Use in Midlife Women: A Survey on Usage Patterns and Perceptions**

The first project of this thesis was a cross-sectional, web-based, quantitative survey characterizing midlife women's cannabis use patterns and perceptions. The primary aim was to identify if midlife women are using cannabis to manage their menopause symptoms. This survey also examined how women are using cannabis, what information sources are used, and general perceptions on cannabis use in menopause. The survey questionnaire was developed by the research team, reviewed by clinical experts, and pilot-tested in a small sample of the target study population (women, ages 35 and over, and located in Alberta). The survey captured information on demographics, self-reported changes to menstrual cycle and presence of menopause symptoms used to categorize menopause stage, cannabis use characteristics, information sources and overall perceptions on cannabis use in menopause. Findings of this web-based survey were reported using the Checklist for Reporting Results of Internet E-Surveys (CHERRIES).<sup>8</sup>

The surveyed sample was representative of the averages of North American women in menopause.<sup>9-11</sup> One-third (33%) of the sample was categorized in perimenopause, an additional third (35%) were categorized in post-menopause, and a minority reported histories of

hysterectomy (13%) and bilateral oophorectomy (4%). The majority of women reported experiencing at least one menopause symptom. Overall, a third (34%) of midlife women indicated current use of cannabis and more than 65% indicated using cannabis at some point in their life. While the majority (75%) of current cannabis users indicated they used cannabis for medical purposes, only a minority (23%) had cannabis medically prescribed through an authorized healthcare provider. An assortment of cannabis formulations was used, with the most frequently reported being edibles (52%) and oils (47%), with a variety in frequency of use. Cannabis was being used to manage menopause symptoms, with the most frequently reported indications being issues with sleep (65%), anxiety (45%), and muscle and joint achiness (33%), and many women (74%) indicated it was helpful for their symptoms.

In between-group comparisons, women who currently used cannabis were more likely to also report experiencing menopause symptoms as compared to non-users. Current cannabis use rates were similar among the different menopause stages. However, women in peri- and post-menopause were statistically more likely to use cannabis for medical purposes or have cannabis medically prescribed than women in pre-menopause. Additionally, women in post-menopause were more likely to use cannabis daily and for menopause symptoms than in pre- or perimenopause. After conducting univariable logistic regression analysis, current cannabis use was found to be significantly associated with a history of smoking, poorer health status, an education level of high school or less. Additionally, difficulties with sleep, mood symptoms, muscle and joint achiness, or genitourinary symptoms were found to be statistically associated with current cannabis use in unadjusted analysis. Whereas vasomotor symptoms were not. In multivariable regression modelling, history of smoking and poorer reported health status remained significant independent predictors of current cannabis use.

The women surveyed were interested in this research topic. More than half of the women surveyed (51%) indicated interest in learning more about managing menopause symptoms with cannabis, and 39% expressed interest to use cannabis for this reason. The most used sources of information on cannabis were internet searches, followed by friends and family. Yet, paradoxically, healthcare providers (physicians, medical cannabis clinics, and pharmacists) were indicated as the most desired sources of information in this area.

To our understanding, this is the first study to directly examine cannabis use patterns and perceptions in midlife women, especially within the context of legalized recreational and medical cannabis. There is an existing gap in published scientific literature investigating the effects of cannabis use on menopause systems, as was verified by a recently conducted systematic review showing only three relevant studies on this research topic.<sup>12</sup> One of these studies, an online survey, conducted by Slavin, Farmer and Earleywine, reported women who used cannabis expected improvement in several menopause symptoms including muscle and joint pain, irritability, sleep problems, depression, anxiety and hot flashes.<sup>13</sup> Women in our study most commonly reported using cannabis for the same symptoms as the outlined by Slavin, Farmer and Earleywine<sup>13</sup> in their data on expectancies, except for hot flashes. Our results found no significant associations between cannabis use and the presence or use for hot flashes. However, Slavin, Farmer and Earleywine<sup>13</sup> did not characterize how women were using cannabis to alleviate their symptoms. Our survey aimed to identify if women in Alberta were using cannabis, specifically to manage symptoms related to menopause, and how they were using it in regard to characteristics such as form, frequency, duration, method and means of accessing.

Despite our findings being novel to this limited research area, there are similarities to studies investigating other methods of managing menopause symptoms or cannabis in the

context of other patient groups. Our data showed women more commonly use the internet to find information on cannabis and not their healthcare providers, which is consistent to how women have been reported to access information on CAM.<sup>14</sup> Furthermore, our data indicated poorer health status and history of smoking was a predictor of cannabis use, which is consistent to correlations identified in previous studies.<sup>15-17</sup>

The findings from our survey showed that midlife women are using cannabis for symptoms overlapping with menopause. By characterizing current cannabis use patterns and perceptions within this population of women in Alberta, we begin to better understand the role cannabis plays in the way midlife women manage their health.

#### **4.1.2 Exploring Cannabis Use in Menopause: A Qualitative Study on Women's Perceptions and Experiences**

The second project of this thesis was a qualitative study, applying qualitative description to conduct semi-structured, one-on-one interviews. The primary aim of this project was to describe and understand the experiences and perspectives of midlife women using cannabis for medical purposes, specifically for symptoms coinciding with menopause. Women were purposefully sampled from the initial surveyed group of women who indicated interest in follow-up interviews based on their menopause status (peri- or post-menopause) and report of current cannabis use. Twelve individual interviews were conducted remotely, due to the COVID-19 pandemic restrictions, by phone or by Zoom videoconferencing software, then audio-recorded and transcribed verbatim. Data collected was analyzed through conventional qualitative content analysis. Findings were reported using the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist.<sup>18</sup>

The interviewed participants had a range of unique experiences with menopause and with using cannabis for medical reasons. Menopause was perceived both positively and negatively by women, from feelings of acceptance, empowerment, gratefulness to feelings of fear towards aging or frustration. Overall, menopause was described as a body-mind changing experience that was a dynamic process commonly overlapping with other health conditions women experienced.

Cannabis was portrayed as a medicine that women felt was a natural, low risk and safe option compared to other pharmaceutical agents, which provided symptom relief and maintained their quality of life during this period of time in their lives. Experiences with cannabis use were categorized into three main themes of initiation and management of cannabis, personal concern with cannabis use, and barriers to cannabis use. Despite some women accessing cannabis medically and others from non-medical sources, their experiences were commonly driven by the women independently managing and experimenting with cannabis used for medical purposes, which gave them a sense of control on their experience going through menopause. There was variability in the supports women portrayed, though healthcare providers tended to have a limited role in the majority of women using cannabis for medical purposes. The need for more pharmacist involvement in medical cannabis was mentioned. Women reported concerns with overall duration of use, developing dependency or tolerance, drug tests, and the unknown effect cannabis had on their body and mind. Several barriers to using cannabis were mentioned where women reported persisting stigma, lack of resources to guide cannabis used medically, cannabis product availability and cost, and impact with international travel. Parallels were identified between a woman's menopause experience and cannabis use experience. Women described an overall lack of information available on both cannabis and menopause, a limited role of primary care providers in guidance going through menopause and with using cannabis medically,

experiencing stigmatization, and an emphasis on learning on their own from anecdotal experiences.

To our knowledge, this is the first qualitative study exploring the experiences and perceptions of women using cannabis during menopause. However, similarities in findings from our qualitative study can be drawn to other studies exploring experiences of women using alternative methods, such as CAM and compounded bioidentical hormone therapy (cBHT), for menopause symptom management. The common sentiment across these studies was that women perceived these alternatives as natural and effective therapies in managing menopause symptoms that were safer than menopause hormone therapy.<sup>19-21</sup> However, it is important to note that cannabis still has the potential for drug interactions, adverse effects, and risk of developing cannabis use disorder. Moreover, women tend not to disclose CAM use to their healthcare providers,<sup>14</sup> a factor also identified in our findings on cannabis. However, our findings highlight the complexity of why women did not involve their healthcare providers. These ranged from experiences of stigma, feeling their healthcare provider did not have enough information on the topic, to study participants describing a sense of control with self-managing cannabis. This was similar to the personal control described by Seidl and Stewart<sup>19</sup> which women had in managing menopause symptoms when using alternative methods. It appears at a time of many physical and psychosocial changes women may be seeking means to feel control of their situations and prevent medicalizing their menopause experience. This signals the need for healthcare providers to initiate the conversation with women on using alternative methods in managing menopause symptoms, including assessing cannabis use in this population. In general, the qualitative results provide context to why midlife women are using cannabis to manage their symptoms.

### 4.1.3 Integration of Quantitative and Qualitative Findings

Integration of quantitative and qualitative results is central in mixed methods research.<sup>22</sup> In this thesis, we followed the explanatory sequential design where the qualitative findings were used to further explain and provide context to the initial quantitative data collected.<sup>22</sup>

Specifically, the quantitative data identified women that were currently using cannabis to manage their menopause symptoms. The qualitative, follow-up interviews were conducted on women purposefully sampled from the surveyed group of women to further explain cannabis experiences in the context of menopause symptom management.

Taken together, both the quantitative and qualitative findings show midlife women are using cannabis and the factors associated with the use of cannabis medically for menopause symptoms. By triangulating the data from the two studies conducted in this thesis, similarities were identified between the responses captured in the survey and the experiences described by women interviewed. From the survey data, cannabis users were more likely to be symptomatic and in poorer health status. The qualitative findings described experiences of women deciding to use cannabis because they were struggling with symptoms having tried other options that were ineffective, causing adverse effects, or feeling dismissed by their healthcare providers for their health concerns. Alternatively, women perceived cannabis as a more natural, low risk option compared to conventional medications. Additionally, the qualitative findings showed women self-managed and experimented with their cannabis use, explaining the need to do their own research by accessing information online or seeking guidance from people they knew. This provided context to the responses captured by the survey indicating women used non-medical sourced cannabis for their health and accessed online and personal contacts as their main sources of cannabis information. Moreover, in both studies women expressed their desire for more



guidance on cannabis use from their healthcare provider and the qualitative study provided a voice to women to share how this could be better achieved. This desire for more healthcare provider guidance in menopausal care, especially in alternative methods to hormone therapies, has already been described in literature.<sup>23</sup> However, by integrating the qualitative findings into the quantitative findings, we are able to highlight the current gaps in clinical care women face and provide recommendations to improve care and direct future research grounded in women's experiences. These experiences identify the complexity of why these current gaps in care exist.

In the published literature, there are many health information seeking behaviour theoretical models that can be applied to better understand how patients search, find, and use health information in order to develop strategies to improve patient outcomes.<sup>24</sup> Women in this study described complex biopsychosocial factors that influenced their experiences with menopause and usage of cannabis for medical purposes and how they sought out or received related information to manage their symptoms and maintain quality of life. This is consistent with the Longo Health Information Model, of how women actively seek information and are exposed to passive information, both influencing decisions made regarding their health.<sup>25,26</sup> An opportunity exists to apply this health information seeking behaviour model in future research to further explore women's use of health information related to menopause and use of cannabis to support the development of resources for patients to use or to foster improved patient-healthcare provider relationships.

The significance of these integrated findings cannot be highlighted without also addressing reflexivity and the researcher's position in the research process. Since both studies were conducted through a healthcare provider's lens, we must acknowledge the pragmatic approach undertaken within this thesis work, which led to identifying unmet needs of midlife

women and proposing recommendations to improve clinical care in menopause. We, as researchers with healthcare background, can be considered as ‘insiders’ to this research context as we were fully aware through our own clinical experiences the existing gaps in care we wanted to address.<sup>27</sup> Moreover, being the qualitative interviews with women were conducted by females, we assume this likely positively influenced the data collected as women have been shown to be more likely to share sensitive information with researchers of the same gender hence supporting the richness of data collected.<sup>27</sup>

Collectively, these findings lay the groundwork for the role cannabis may have in managing menopause symptoms that have so far been driven by health claims and anecdotal evidence. Interestingly, many parallels can be drawn from this study to studies that have previously investigated the role of CAM and cBHT in managing menopause symptoms. Overall, this perceived notion of safe, effective, and natural appears to be a commonality in women exploring alternative methods to hormone therapies in managing their menopause symptoms.<sup>19, 20</sup> Continued attention to investigating cannabis is warranted in order to better understand the effect on menopause symptoms and address the paucity of studies that currently exist, as was identified by the systematic review by Mejia-Gomez et al.<sup>12</sup>

## **4.2 IMPLICATIONS AND FUTURE DIRECTIONS**

### **4.2.1 Clinical Practice**

The findings presented in this thesis show variability in healthcare provider involvement in women’s menopausal care and use of cannabis medically. Specifically, the survey results indicated healthcare providers are not a common source for cannabis information, despite being the most desired. Additionally, the findings from the interviews suggest women do want their healthcare providers more involved both in menopause management and for guidance in using

cannabis. Although, literature suggests many healthcare providers are hesitant to provide advice on cannabis used medically.<sup>28, 29</sup> Likewise, another study identified healthcare providers had limited knowledge on menopause and management approaches.<sup>30, 31</sup> This signals an existing unmet need of patients due to gaps in care and an opportunity to inform and increase the knowledge of healthcare providers providing care to women in menopause.

Several recommendations can be made to support healthcare providers from our data. First, we suggest the use of a standardized process to conduct a work-up on midlife women to assess for menopause symptoms. The North American Menopause Society has resources available for clinicians to allow for such an assessment, such as the Menopause Health Questionnaire.<sup>32</sup> Moreover, it is important to take a patient-centered, holistic approach to assessing the individual needs of women going through menopause. Aninye et al.<sup>33</sup> and Mahadeen, Halabi and Callister<sup>34</sup> provide recommendations for clinicians for assessing menopausal women that focus on self-care and supporting quality of life, rather than viewing menopause as a disease with symptoms.

Furthermore, our data revealed poorer overall health was associated with cannabis use. This highlights the need to for healthcare providers to consider if their patients may be turning to using cannabis to self-manage symptoms. Pharmacists, as medication experts, are positioned to be able to provide advice on drug interactions, dosage and formulation based on pre-existing knowledge of pharmacology and also have the ability to critically appraise existing research or anecdotal claims to guide patients with cannabis use. It was evident from the experiences shared by women there was desire for healthcare providers to be open-minded to cannabis as a therapeutic agent, acknowledge cannabis as an option in therapy, provide guidance to information resources, and ask about cannabis use by differentiating medical uses from

recreational. We recommend healthcare providers be aware of how they approach the discussion of cannabis in their practice. Fostering an open conversation, free of stigma and judgement, will be key in allowing such assessments to occur. For example, many standard medical history forms still include cannabis as part of social history or recreational drug use. One recommendation extending from the findings of this study is to separate out medical uses of cannabis from recreational, to allow for more thorough assessment on the medical uses of cannabis and shift away from the stigma of cannabis being only an illicit substance.

Lastly, women's experiences highlighted the need for more resources in both menopause and cannabis. Healthcare providers are positioned to not only provide direct patient care but to also support patients in making informed decisions through provision of resources. One way of doing this is teaching patients how to recognize credible information from misinformation. We suggest primary care providers take the time to educate their patients on resources that can be independently accessed for health information. This is especially critical at a time when all information is easily accessible.

#### **4.2.2 Education, Policy, and Advocacy**

Focus should be drawn to developing clinical resources that both women and clinicians can utilize in menopausal care. The findings from this thesis provide the initial platform of knowledge needed for future development of patient decision aid tools and clinical guides. Moreover, there is a need to review current education curriculums for clinician learners to ensure knowledge taught is supportive of the needs of patients. It has been documented that even within women's health specialties, clinician learners are not receiving adequate education on menopause.<sup>31</sup> Targeting curricula will expose learners earlier on in their training to promote sufficient knowledge and experience by the time they enter independent practice.

With reports of more Canadians using non-medical cannabis to manage their health issues<sup>7</sup>, it is critical educational resources are developed in the form of clinical professional development opportunities or courses in undergraduate education to teach care providers about cannabis. Until more evidence in the form of clinical trials is made available, we suggest healthcare providers take the time to learn directly from patient experiences to gain awareness on cannabis uses within their practice areas. We plan to support this form of learning opportunity by disseminating our findings of women's experiences using cannabis in clinical and public settings.

Current medical cannabis prescribing regulations are managed at the federal government level in Canada.<sup>35</sup> Interestingly, some women in our study described using others' supply of medically prescribed cannabis to managing their own health issues. Policymakers should be aware of these habits occurring in the public and promote the safety of accessing medical cannabis.

Lastly, our findings address the need for professional organizations to acknowledge cannabis is being used by women to manage their menopause symptoms. These organizations can serve as advocates to the needs of midlife women by allocating resources to educate the public, healthcare providers, and policy makers. Also, such organizations can assist in the development of clinical guidelines that address cannabis use in menopause.

#### **4.2.3 Future Research**

Taken together, the novel findings from survey and the qualitative interviews establish a platform of knowledge that can be used to direct future research on cannabis used in menopause. The survey provided a snapshot of menopause symptoms and cannabis use patterns and perceptions in a population of midlife women in Alberta. However, we did not assess the

severity of each menopause symptom, specific characteristics pertaining to each cannabis product, nor was the effectiveness of cannabis on each separate symptom explored. With the knowledge that women are using cannabis for menopause symptoms, future research is needed in the form of a more comprehensive self-reported, cross-sectional survey. This can include more detailed work-up of the women's menopause symptoms, individual cannabis products taken (as many women were using multiple methods), where each individual product was accessed. For example, use of a validated menopause symptom questionnaire, such as the Menopause-Specific Quality of Life (MENQOL)<sup>36</sup>, can offer to provide a more complete work up of symptoms to determine severity and impact on quality of life. A scoping review conducted by our research team showed this is a widely used questionnaire for the assessment of menopause experience.<sup>37</sup> Additionally, a more detailed breakdown of cannabis use can mirror nationally conducted surveys.<sup>38, 39</sup> Since cannabis is legalized across Canada and differences in patterns of use across the provinces have been confirmed<sup>6</sup>, a more comprehensive survey can also be conducted in midlife women across the country in order to better understand cannabis user rates and patterns throughout Canada. Conducting a similar study as to the one described in this thesis within a specialized menopause clinic can also offer additional benefits. These women tend to be experiencing more severe menopause symptoms requiring the care of a specialist team and it is currently unknown if they, too, are also using cannabis to self-medicate. In this setting, self-reported menopause stages can be backed by clinical diagnoses made by the healthcare providers to increase the validity in inferences made.

Cannabis product variability was brought up by study participants. A focus should be made within the pharmaceutical sciences to standardize cannabis product formulations in order to allow for the investigation into the safety and efficacy of cannabis as a drug therapy. As well,

safety and efficacy cannot be determined objectively from cross-sectional survey data, so there is a need for future research to conduct longitudinal, case-control, or blinded clinical trials to investigate such outcomes of cannabis therapy for menopause symptoms. In these cases, application of the Menopause Symptom Treatment Satisfaction Questionnaire (MS-TSQ) Questionnaire<sup>40</sup> can support objectively investigating cannabis effectiveness in relieving menopause symptoms over a period of time. As mentioned, cannabis product standardization can be an issue with this plant-derived source especially with the growing number of available cannabis products and strains made available. So, we suggest the consideration of conducting ‘N-of-1’ clinical trials, which would take a patient-centered approach to investigating safety and efficacy of cannabis products on a variety of menopause symptoms while allowing for individualization of dosing and administration in a controlled environment.<sup>41</sup> Such trials have already been conducted for medical cannabis application in chronic pain conditions<sup>42</sup> and recently a protocol has been published to study cannabis in the context of dementia.<sup>43</sup> However, these studies would rely on the detailed documentation of each individual participant’s presenting symptoms and outcomes to ensure generalizability of findings.

#### **4.3 CONCLUSION**

By applying a mixed methods research design, this thesis explored midlife women’s use of cannabis for menopause symptoms. Integrating the findings from the quantitative and qualitative studies in this thesis showed women are self-managing and experimenting with cannabis to manage symptoms that coincide with menopause. These results suggest healthcare providers have an opportunity to further support women in their menopausal care and with cannabis being used for medical purposes, especially in providing access to resources or education on these topics. Additionally, these results signal a need for future research to further

investigate the efficacy and safety of cannabis used for symptoms of menopause in midlife women.



#### 4.4 REFERENCES

1. Simon JA, Reape KZ. Understanding the menopausal experiences of professional women. *Menopause*. 2009;16(1):73-6.
2. Minkin MJ. Menopause: Hormones, Lifestyle, and Optimizing Aging. *Obstetrics and Gynecology Clinics of North America*. 2019;46(3):501-14.
3. El Khoudary SR, Greendale G, Crawford SL, Avis NE, Brooks MM, Thurston RC, et al. The menopause transition and women's health at midlife: a progress report from the Study of Women's Health Across the Nation (SWAN). *Menopause*. 2019;26:1213-27.
4. Hall L, Callister LC, Berry JA, Matsumura G. Meanings of menopause: Cultural influences on perception and management of menopause. *Journal of Holistic Nursing*. 2007;25(2):106-18.
5. Obermeyer CM. Menopause across cultures: a review of the evidence. *Menopause*. 2000;7(3):184-92.
6. Rotermann M. Looking back from 2020, how cannabis use and related behaviours changed in Canada. *Health Reports*. 2021;32(no. 82-003-X):1-14.
7. Consumer Health Products Canada. Full Public Policy Position – Cannabis Regulation Ottawa, ON2019 [1-3]. Available from: <https://www.chpcanada.ca/wp-system/uploads/2019/11/Canabis-position-statement.2019.pdf>.
8. Eysenbach G. Improving the quality of Web surveys: the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). *J Med Internet Res*. 2004;6(3):1-6.
9. Costanian C, McCague H, Tamim H. Age at natural menopause and its associated factors in Canada: cross-sectional analyses from the Canadian Longitudinal Study on Aging. *Menopause*. 2018;25(3):265-72.
10. Gold EB, Bromberger J, Crawford S, Samuels S, Greendale GA, Harlow SD, et al. Factors Associated with Age at Natural Menopause in a Multiethnic Sample of Midlife Women. *American Journal of Epidemiology*. 2001;153(9):865-74.
11. Soares CN, Taylor V. Effects and Management of the Menopausal Transition in Women With Depression and Bipolar Disorder. *Journal of Clinical Psychiatry*. 2007;68:16-21.
12. Mejia-Gomez J, Phung N, Philippopoulos E, Murphy KE, Wolfman W. The impact of cannabis use on vasomotor symptoms, mood, insomnia and sexuality in perimenopausal and postmenopausal women: a systematic review. *Climacteric*. 2021:1-10.

13. Slavin MN, Farmer S, Earleywine M. Expectancy mediated effects of marijuana on menopause symptoms. *Addiction Research & Theory*. 2016;24(4):322-9.
14. Posadzki P, Lee MS, Moon TW, Choi TY, Park TY, Ernst E. Prevalence of complementary and alternative medicine (CAM) use by menopausal women: a systematic review of surveys. *Maturitas*. 2013;75(1):34-43.
15. Ogborne AC, Smart RG, Adlaf E. Self-reported medical use of marijuana: a survey of the general population. *Canadian Medical Association Journal*. 2000;162:1685-6.
16. Turna J, Balodis I, Munn C, Van Ameringen M, Busse J, MacKillop J. Overlapping patterns of recreational and medical cannabis use in a large community sample of cannabis users. *Compr Psychiatry*. 2020;102:152188.
17. Hamilton HA, Brands B, Ialomiteanu AR, Mann RE. Therapeutic use of cannabis: Prevalence and characteristics among adults in Ontario, Canada. *Can J Public Health*. 2017;108(3):e282-e7.
18. Tong A, Sainsbury P, Craig J. Consolidate criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007;19(6):349-57.
19. Seidl MM, Stewart DE. Alternative treatments for menopausal symptoms. Qualitative study of women's experiences. *Canadian Family Physician*. 1998;44:1271.
20. Thompson JJ, Ritenbaugh C, Nichter M. Why women choose compounded bioidentical hormone therapy: lessons from a qualitative study of menopausal decision-making. *BMC Womens Health*. 2017;17(97):1-18.
21. Fishman JR, Flatt MA, Settersten RA, Jr. Bioidentical hormones, menopausal women, and the lure of the "natural" in U.S. anti-aging medicine. *Soc Sci Med*. 2015;132:79-87.
22. Creswell JW, Plano Clark VL. *Designing and Conducting Mixed Methods Research*. 3rd ed. Los Angeles: SAGE Publications; 2017. 492 p.
23. Ma J, Drieling R, Stafford RS. US women desire greater professional guidance on hormone and alternative therapies for menopause symptom management. *Menopause*. 2006;13(3):506-16.
24. Zare-Farashbandi F, Lalazaryan A. A Review of models and theories of health information seeking behavior. *International Journal of Health System and Disaster Management*. 2014;2(4).

25. Longo DR. Understanding health information, communication, and information seeking of patients and consumers: a comprehensive and integrated model. *Health Expectations*. 2005;8(3):189-94.
26. Longo DR, Schubert SL, Wright BA, LeMaster J, Williams CD, Clore JN. Health information seeking, receipt, and use in diabetes self-management. *Ann Fam Med*. 2010;8(4):334-40.
27. Berger R. Now I see it, now I don't: researcher's position and reflexivity in qualitative research. *Qualitative Research*. 2013;15(2):219-34.
28. Ng JY, Gilotra K, Usman S, Chang Y, Busse JW. Attitudes toward medical cannabis among family physicians practising in Ontario, Canada: a qualitative research study. *CMAJ Open*. 2021;9(2):E342-E8.
29. Christensen VA, Nugent SM, Ayers CK, Morasco BJ, Kansagara D. A qualitative study of VHA clinicians' knowledge and perspectives on cannabis for medical purposes. *Fam Pract*. 2021;38(4):479-83.
30. Yeganeh L, Boyle J, Teede H, Vincent A. Knowledge and attitudes of health professionals regarding menopausal hormone therapies. *Climacteric*. 2017;20(4):348-55.
31. Christianson MS, Ducie JA, Altman K, Khafagy AM, Shen W. Menopause education: needs assessment of American obstetrics and gynecology residents. *Menopause*. 2013;20(11):1120-5.
32. The North American Menopause Society. Menopause Health Questionnaire 2005 [Available from: <https://www.menopause.org/publications/clinical-practice-materials/menopause-health-questionnaire>].
33. Aninye IO, Laitner MH, Chinnappan S, Society for Women's Health Research Menopause Working G. Menopause preparedness: perspectives for patient, provider, and policymaker consideration. *Menopause*. 2021.
34. Mahadeen AI, Halabi JO, Callister LC. Menopause: a qualitative study of Jordanian women's perceptions. *International Nursing Review*. 2008;55:427-33.
35. Health Canada. Cannabis for medical purposes under the Cannabis Act: information and improvements Government of Canada 2021 [updated 19 May 2021; cited 2021 20 August]. Available from: <https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/medical-use-cannabis.html>.

36. Hilditch JR, Lewis J, Peter A, van Maris B, Ross A, Franssen E, et al. A menopause-specific quality of life questionnaire: development and psychometric properties. *Maturitas*. 1996;24(6):161-75.
37. Sydora BC, Fast H, Campbell S, Yuksel N, Lewis JE, Ross S. Use of the Menopause-Specific Quality of Life (MENQOL) questionnaire in research and clinical practice: a comprehensive scoping review. *Menopause*. 2016;23(9):1038-51.
38. Health Canada. The Canadian Cannabis Survey 2019 [updated 26 June 2019; cited 2019]. Available from: <https://epe.lac-bac.gc.ca/100/200/301/pwgsc-tpsgc/por-ef/health/2019/130-18-e/report.pdf>.
39. Statistics Canada. National Cannabis Survey 2019 [cited 2019 January ]. Available from: [https://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&a=1&&lang=en&Item\\_Id=1256316](https://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&a=1&&lang=en&Item_Id=1256316).
40. Hill CD, Fehnel SE, Bobula JD, Yu H, McLeod LD. Development and preliminary validation of the Menopause Symptoms Treatment Satisfaction Questionnaire (MS-TSQ). *Menopause*. 2007;14(6):1047-55.
41. Lillie EO, Patay B, Diamant J, Issell B, Topol EJ, Schork NJ. The n-of-1 clinical trial: the ultimate strategy for individualizing medicine? *Personalized medicine*. 2011;8(2):161-73.
42. Notcutt W, Price M, Miller R, Newport S, Phillips C, Simmons S, et al. Initial experiences with medicinal extracts of cannabis for chronic pain: results from 34 ‘N of 1’ studies. *Anaesthesia*. 2004;59(5):440-52.
43. Timler A, Bulsara C, Bulsara M, Vickery A, Smith J, Codde J. Use of cannabinoid-based medicine among older residential care recipients diagnosed with dementia: study protocol for a double-blind randomised crossover trial. *Trials*. 2020;21(1):188.

## **BIBLIOGRAPHY**

### **Chapter 1 References**

1. Minkin MJ. Menopause: Hormones, Lifestyle, and Optimizing Aging. *Obstetrics and Gynecology Clinics of North America*. 2019;46(3):501-14.
2. Baber RJ, Panay N, Fenton A, Group IMSW. 2016 IMS Recommendations on women's midlife health and menopause hormone therapy. *Climacteric*. 2016;19(2):109-50.
3. Palacios S, Henderson VW, Siseles N, Tan D, Villaseca P. Age of menopause and impact of climacteric symptoms by geographical region. *Climacteric*. 2010;13(5):419-28.
4. Gold EB, Bromberger J, Crawford S, Samuels S, Greendale GA, Harlow SD, et al. Factors Associated with Age at Natural Menopause in a Multiethnic Sample of Midlife Women. *American Journal of Epidemiology*. 2001;153(9):865-74.
5. Costanian C, McCague H, Tamim H. Age at natural menopause and its associated factors in Canada: cross-sectional analyses from the Canadian Longitudinal Study on Aging. *Menopause*. 2018;25(3):265-72.
6. Soares CN, Taylor V. Effects and Management of the Menopausal Transition in Women With Depression and Bipolar Disorder. *Journal of Clinical Psychiatry*. 2007;68:16-21.
7. Shifren JL, Gass ML, Group NRfCCoMWW. The North American Menopause Society recommendations for clinical care of midlife women. *Menopause*. 2014;21(10):1038-62.
8. Hendrix SL. Bilateral oophorectomy and premature menopause. *Am J Med*. 2005;118 Suppl 12B:131-5.
9. The North American Menopause Society. The 2017 hormone therapy position statement of The North American Menopause Society. *Menopause*. 2017;24(7):728-53.
10. Avis NE, Crawford SL, Greendale G, Bromberger JT, Everson-Rose SA, Gold EB, et al. Duration of menopausal vasomotor symptoms over the menopause transition. *JAMA Intern Med*. 2015;175(4):531-9.
11. El Khoudary SR, Greendale G, Crawford SL, Avis NE, Brooks MM, Thurston RC, et al. The menopause transition and women's health at midlife: a progress report from the Study of Women's Health Across the Nation (SWAN). *Menopause*. 2019;26:1213-27.

12. The North American Menopause Society. The 2020 genitourinary syndrome of menopause position statement of The North American Menopause Society. *Menopause*. 2020;27(9):976-92.
13. Nappi RE, Palacios S, Bruyniks N, Particco M, Panay N, EVES Study Investigators. The burden of vulvovaginal atrophy on women's daily living: implications on quality of life from a face-to-face real-life survey. *Menopause*. 2019;26(5):485-91.
14. Nappi RE, Kroll R, Siddiqui E, Stoykova B, Rea C, Gemmen E, et al. Global cross-sectional survey of women with vasomotor symptoms associated with menopause: prevalence and quality of life burden. *Menopause*. 2021;28:875-82.
15. Williams RE, Levine KB, Kalilani L, Lewis J, Clark RV. Menopause-specific questionnaire assessment in US population-based study shows negative impact on health-related quality of life. *Maturitas*. 2009;62(2):153-9.
16. Blumel JE, Chedraui P, Baron G, Belzares E, Bencosme A, Calle A, et al. A large multinational study of vasomotor symptom prevalence, duration, and impact on quality of life in middle-aged women. *Menopause*. 2011;18(7):778-85.
17. Pinkerton JV, Abraham L, Bushmakina AG, Cappelleri JC, Komm BS. Relationship between changes in vasomotor symptoms and changes in menopause-specific quality of life and sleep parameters. *Menopause*. 2016;23(10):1060-6.
18. Soares CN, Maki PM. Menopausal transition, mood, and cognition: an integrated view to close the gaps. *Menopause*. 2010;17(4):812-4.
19. Schmidt PJ, Haq N, Rubinow DR. A Longitudinal Evaluation of the Relationship Between Reproductive Status and Mood in Perimenopausal Women. *The American Journal of Psychiatry*. 2004;161:2238-44.
20. Freeman EW, Sammel MD, Liu L, Gracia CR, Nelson DB, Hollander L. Hormones and Menopausal Status as Predictors of Depression in Women in Transition to Menopause. *Archives of General Psychiatry*. 2004;61:62-70.
21. Bromberger J, Meyer PM, Kravits HM, Sommer B, Cordal A, Powell L, et al. Psychologic Distress and Natural Menopause: A Multiethnic Community Study. *American Journal of Public Health*. 2001;91:1435-42.

22. Bromberger JT, Schott L, Kravitz HM, Joffe H. Risk factors for major depression during midlife among a community sample of women with and without prior major depression: are they the same or different? *Psychol Med.* 2015;45(8):1653-64.
23. Maki PM, Kornstein SG, Joffe H, Bromberger JT, Freeman EW, Athappilly G, et al. Guidelines for the evaluation and treatment of perimenopausal depression: summary and recommendations. *Menopause.* 2018;25(10):1069-85.
24. Moreno-Frias C, Figueroa-Vega N, Malacara JM. Relationship of sleep alterations with perimenopausal and postmenopausal symptoms. *Menopause.* 2014;21(9):1017-22.
25. Guidozi F. Sleep and sleep disorders in menopausal women. *Climacteric.* 2013;16(2):214-9.
26. Szoek CE, Cicuttini FM, Guthrie JR, Dennerstein L. The relationship of reports of aches and joint pains to the menopausal transition: a longitudinal study. *Climacteric.* 2008;11(1):55-62.
27. Watt FE. Musculoskeletal pain and menopause. *Post Reprod Health.* 2018;24(1):34-43.
28. Gibson CJ, Li Y, Bertenthal D, Huang AJ, Seal KH. Menopause symptoms and chronic pain in a national sample of midlife women veterans. *Menopause.* 2019;26(7):708-13.
29. Hall L, Callister LC, Berry JA, Matsumura G. Meanings of menopause: Cultural influences on perception and management of menopause. *Journal of Holistic Nursing.* 2007;25(2):106-18.
30. Reid R, Abramson BL, Blake J, Desindes S, Dodin S, Johnston S, et al. Managing Menopause. *Journal of Obstetrics and Gynaecology Canada.* 2014;36(9):830-3.
31. Rossouw JE, Anderson GL, Prentice RL, LaCroix AZ, Kooperberg C, Stefanick ML, et al. Risks and benefits of estrogen plus progestin in healthy postmenopausal women: principal results From the Women's Health Initiative randomized controlled trial. *JAMA.* 2002;288(3):321-33.
32. Ettinger B, Wang SM, Leslie RS, Patel BV, Bouliware MJ, Mann ME, et al. Evolution of postmenopausal hormone therapy between 2002 and 2009. *Menopause.* 2012;19(6):610-5.
33. Steinkellner AR, Denison SE, Eldridge SL, Lenzi LL, Chen W, Bowlin SJ. A decade of postmenopausal hormone therapy prescribing in the United States: long-term effects of the Women's Health Initiative. *Menopause.* 2012;19(6):616-21.
34. Costanian C, Edgell H, Ardern CI, Tamim H. Hormone therapy use in the Canadian Longitudinal Study on Aging: a cross-sectional analysis. *Menopause.* 2018;25(1):46-53.

35. Lobo RA. Hormone-replacement therapy: current thinking. *Nature Reviews Endocrinology*: Nature Publishing Group; 2017. p. 220-31.
36. Kang HJ, Ansbacher R, Hammoud MM. Use of alternative and complementary medicine in menopause. *International Journal of Gynecology and Obstetrics*. 2002;79:195-207.
37. SIGMA. Pocket Guide Menopause Management: A practical tool for healthcare professionals Canadian Menopause Society/Société Canadienne de Ménopause (CMS/SCM)n.d. [1-52]. Available from:  
<https://www.sigmamenopause.com/sites/default/files/pdf/publications/Final-Pocket%20Guide.pdf>.
38. Posadzki P, Lee MS, Moon TW, Choi TY, Park TY, Ernst E. Prevalence of complementary and alternative medicine (CAM) use by menopausal women: a systematic review of surveys. *Maturitas*. 2013;75(1):34-43.
39. Johnson A, Roberts L, Elkins G. Complementary and Alternative Medicine for Menopause. *J Evid Based Integr Med*. 2019;24:1-14.
40. Seidl MM, Stewart DE. Alternative treatments for menopausal symptoms. Qualitative study of women's experiences. *Canadian Family Physician*. 1998;44:1271.
41. Ma J, Drieling R, Stafford RS. US women desire greater professional guidance on hormone and alternative therapies for menopause symptom management. *Menopause*. 2006;13(3):506-16.
42. Yuksel N, Treseng L, Malik B, Ogbogu U. Promotion and marketing of bioidentical hormone therapy on the internet: a content analysis of websites. *Menopause*. 2017;24(10):1129-35.
43. Fishman JR, Flatt MA, Settersten RA, Jr. Bioidentical hormones, menopausal women, and the lure of the "natural" in U.S. anti-aging medicine. *Soc Sci Med*. 2015;132:79-87.
44. Thompson JJ, Ritenbaugh C, Nichter M. Why women choose compounded bioidentical hormone therapy: lessons from a qualitative study of menopausal decision-making. *BMC Womens Health*. 2017;17(1):97.
45. ACOG. The American College of Obstetricians and Gynecologists Committee Opinion #532: Compounded Bioidentical Menopausal Hormone Therapy. *Obstetrics & Gynecology*. 2012;120:411-5.



46. National Academies of Sciences E, and Medicine,. In: Jackson LM, Parker RM, Mattison DR, editors. The Clinical Utility of Compounded Bioidentical Hormone Therapy: A Review of Safety, Effectiveness, and Use. Washington (DC)2020.
47. Health Canada. Understanding the New Access to Cannabis for Medical Purposes Regulations Government of Canada2016 [updated 30 Sept 2016; cited 2021 05 May]. Available from: <https://www.canada.ca/en/health-canada/services/publications/drugs-health-products/understanding-new-access-to-cannabis-for-medical-purposes-regulations.html>.
48. Government of Canada. Marihuana Medical Access Regulations Justice Laws Website: Government of Canada; 2001 [updated 06 June 2013; cited 2021 05 May]. Available from: <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2001-227/20100311/P1TT3xt3.html>.
49. Government of Canada. Marihuana for Medical Purposes Regulations Justice Laws Website: Government of Canada; 2013 [updated 30 Sept 2013; cited 2021 12 May]. Available from: <https://laws-lois.justice.gc.ca/eng/regulations/sor-2013-119/20130607/P1TT3xt3.html>.
50. Government of Canada. Access to Cannabis for Medical Purposes Regulations Justice Laws Website: Government of Canada 2016 [updated 23 Aug 2016; cited 2021 12 May]. Available from: <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2016-230/20160805/P1TT3xt3.html>.
51. Government of Canada. Cannabis Act Justice Laws Website: Government of Canada; 2018 [updated 17 Oct 2021; cited 2021 11 May 2021]. Available from: <https://laws-lois.justice.gc.ca/eng/acts/c-24.5/page-1.html#h-76881>.
52. Hawley P, Gobbo M, Afghari N. The impact of legalization of access to recreational Cannabis on Canadian medical users with Cancer. BMC Health Serv Res. 2020;20(1):977.
53. Rotermann M. Looking back from 2020, how cannabis use and related behaviours changed in Canada. Health Reports. 2021;32(no. 82-003-X):1-14.
54. Rotermann M. What has changed since cannabis was legalized? Health Reports. 2020;31(2):11-20.
55. Government of Alberta. Alberta Cannabis Frameworks and Legislation Government of Alberta2021 [updated No date; cited 2021 10 May]. Available from: <https://www.alberta.ca/cannabis-framework.aspx#p6241s3>.
56. Health Canada. ARCHIVED – market data under the Access to Cannabis for Medical Purposes Regulations Government of Canada [updated 29 August 2019. Available from:

<https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/licensed-producers/market-data.html>.

57. Health Canada. Data on cannabis for medical purposes Government of Canada: Health Canada; [updated 15 June 2021; cited 2021 15 July]. Available from: <https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/research-data/medical-purpose.html>.
58. Consumer Health Products Canada. Full Public Policy Position – Cannabis Regulation Ottawa, ON2019 [1-3]. Available from: <https://www.chpcanada.ca/wp-system/uploads/2019/11/Canabis-position-statement.2019.pdf>.
59. Turna J, Balodis I, Munn C, Van Ameringen M, Busse J, MacKillop J. Overlapping patterns of recreational and medical cannabis use in a large community sample of cannabis users. *Compr Psychiatry*. 2020;102:152188.
60. Ng JY, Gilotra K, Usman S, Chang Y, Busse JW. Attitudes toward medical cannabis among family physicians practising in Ontario, Canada: a qualitative research study. *CMAJ Open*. 2021;9(2):E342-E8.
61. Health Canada. Summary report: Consultation on potential market for health products containing cannabis that would not require practitioner oversight [Publication]. Government of Canada [updated 25 September 2020. Available from: <https://www.canada.ca/en/health-canada/services/publications/drugs-health-products/summary-report-consultation-potential-market-health-products-cannabis.html>.
62. Christensen VA, Nugent SM, Ayers CK, Morasco BJ, Kansagara D. A qualitative study of VHA clinicians' knowledge and perspectives on cannabis for medical purposes. *Fam Pract*. 2021;38(4):479-83.
63. Touw M. The religious and medicinal uses of Cannabis in China, India and Tibet. *J Psychoactive Drugs*. 1981;13(1):23-34.
64. Russo E. Cannabis Treatments in Obstetrics and Gynecology: A Historical Review. *Journal of Cannabis Therapeutics*. 2002;2(3-4):5-35.
65. Health Canada. Information for Health Care Professionals: Cannabis (marihuana, marijuana) and the cannabinoids Health Canada2018 [updated Oct 2018; cited 2021 18 May]. Available from: <https://www.canada.ca/en/health-canada/services/drugs->

medication/cannabis/information-medical-practitioners/information-health-care-professionals-cannabis-cannabinoids.html#a4.0.

66. Allan GM, Ramji J, Perry D, Ton J, Beahm NP, Crisp N, et al. Simplified guideline for prescribing medical cannabinoids in primary care. *Canadian Family Physician*. 2018;64(2):111-20.
67. Aizpurua-Olaizola O, Soydaner U, Öztürk E, Schibano D, Simsir Y, Navarro P, et al. Evolution of the Cannabinoid and Terpene Content during the Growth of *Cannabis sativa* Plants from Different Chemotypes. *Journal of Natural Products*. 2016;79:324-31.
68. Russo EB. Taming THC: potential cannabis synergy and phytocannabinoid-terpenoid entourage effects. *Br J Pharmacol*. 2011;163(7):1344-64.
69. Zou S, Kumar U. Cannabinoid Receptors and the Endocannabinoid System: Signaling and Function in the Central Nervous System. *Int J Mol Sci*. 2018;19(3).
70. Laprairie RB, Bagher AM, Kelly ME, Denovan-Wright EM. Cannabidiol is a negative allosteric modulator of the cannabinoid CB1 receptor. *Br J Pharmacol*. 2015;172(20):4790-805.
71. Chandra S, Radwan MM, Majumdar CG, Church JC, Freeman TP, ElSohly MA. New trends in cannabis potency in USA and Europe during the last decade (2008-2017). *Eur Arch Psychiatry Clin Neurosci*. 2019;269(1):5-15.
72. McLaren J, Swift W, Dillon P, Allsop S. Cannabis potency and contamination: a review of the literature. *Addiction*. 2008;103(7):1100-9.
73. MacCallum CA, Russo EB. Practical considerations in medical cannabis administration and dosing. *European Journal of Internal Medicine*. 2018;49:12-9.
74. Walker OS, Holloway AC, Raha S. The role of the endocannabinoid system in female reproductive tissues. *J Ovarian Res*. 2019;12(1):3.
75. Babyn K, Kung J, Mayo P, Yuksel N, editors. Understanding the efficacy and safety of cannabis use in women's health: A scoping review. *Canadian Pharmacy Education and Research Conference (CPERC)*; 2019 12-13 June 2019; Edmonton, AB.
76. Corsi DJ, Murphy MSQ, Cook J. The Effects of Cannabis on Female Reproductive Health Across the Life Course. *Cannabis and Cannabinoid Research*. 2020;6(4):275-87.
77. Mejia-Gomez J, Phung N, Philippopoulos E, Murphy KE, Wolfman W. The impact of cannabis use on vasomotor symptoms, mood, insomnia and sexuality in perimenopausal and postmenopausal women: a systematic review. *Climacteric*. 2021:1-10.

78. Benedikt RA, Cristofaro P, Mendelson JH, Mello NK. Effects of acute marijuana smoking in post-menopausal women. *Psychopharmacology*. 1986;90(1):14-7.
79. Slavin MN, Farmer S, Earleywine M. Expectancy mediated effects of marijuana on menopause symptoms. *Addiction Research & Theory*. 2016;24(4):322-9.
80. Fantry LE, Zhan M, Taylor GH, Sill AM, Flaws JA. Age of menopause and menopausal symptoms in HIV-infected women. *AIDS Patient Care & STDs*. 2005;19(11):703-11.
81. Bierut T, Krauss MJ, Sowles SJ, Cavazos-Rehg PA. Exploring Marijuana Advertising on Weedmaps, a Popular Online Directory. *Prev Sci*. 2017;18(2):183-92.
82. Yuksel N, Ke S, Wong A, Yu X, Ogbogu U, Necyk C, editors. Promotion and Marketing of Medical Marijuana on the Internet. Abstracts for the 16th World Congress of the IMS; 2018; Vancouver.
83. Marlatt KL, Beyl RA, Redman LM. A qualitative assessment of health behaviors and experiences during menopause: A cross-sectional, observational study. *Maturitas*. 2018;116:36-42.
84. Bremer E, Jallo N, Rodgers B, Kinser P, Dautovich N. Anxiety in Menopause: A Distinctly Different Syndrome? *The Journal for Nurse Practitioners*. 2019;15(5):374-8.
85. Creswell JW, Plano Clark VL. *Designing and Conducting Mixed Methods Research*. 3rd ed. Los Angeles: SAGE Publications; 2017. 492 p.
86. Greene JC, Caracelli VJ, Graham WF. Toward a conceptual framework for mixed-method evaluation designs. *Educational evaluation and policy analysis*. 1989;11(3):255-74.
87. Morgan DL. Practical strategies for combining qualitative and quantitative methods: Applications to health research. *Qualitative health research*. 1998;8(3):362-76.
88. Morgan DL. Pragmatism as a Paradigm for Social Research. *Qualitative Inquiry*. 2014;20(8):1045-53.
89. Savin-Baden M, Howell-Major C. *Qualitative research: The essential guide to theory and practice*: Routledge; 2013.
90. Holmes AGD. Researcher Positionality - A Consideration of Its Influence and Place in Qualitative Research - A New Researcher Guide. *Shanlax International Journal of Education*. 2020;8(4):1-10.

## Chapter 2 References

1. Minkin MJ. Menopause: Hormones, Lifestyle, and Optimizing Aging. *Obstetrics and Gynecology Clinics of North America*. 2019;46(3):501-14.
2. El Khoudary SR, Greendale G, Crawford SL, Avis NE, Brooks MM, Thurston RC, et al. The menopause transition and women's health at midlife: a progress report from the Study of Women's Health Across the Nation (SWAN). *Menopause*. 2019;26:1213-27.
3. Gold EB, Bromberger J, Crawford S, Samuels S, Greendale GA, Harlow SD, et al. Factors Associated with Age at Natural Menopause in a Multiethnic Sample of Midlife Women. *American Journal of Epidemiology*. 2001;153(9):865-74.
4. Costanian C, McCague H, Tamim H. Age at natural menopause and its associated factors in Canada: cross-sectional analyses from the Canadian Longitudinal Study on Aging. *Menopause*. 2018;25(3):265-72.
5. Avis NE, Crawford SL, Greendale G, Bromberger JT, Everson-Rose SA, Gold EB, et al. Duration of menopausal vasomotor symptoms over the menopause transition. *JAMA Intern Med*. 2015;175(4):531-9.
6. The North American Menopause Society. The 2020 genitourinary syndrome of menopause position statement of The North American Menopause Society. *Menopause*. 2020;27(9):976-92.
7. Baber RJ, Panay N, Fenton A, Group IMSW. 2016 IMS Recommendations on women's midlife health and menopause hormone therapy. *Climacteric*. 2016;19(2):109-50.
8. The North American Menopause Society. The 2017 hormone therapy position statement of The North American Menopause Society. *Menopause*. 2017;24(7):728-53.
9. Reid R, Abramson BL, Blake J, Desindes S, Dodin S, Johnston S, et al. Managing Menopause. *Journal of Obstetrics and Gynaecology Canada*. 2014;36(9):830-3.
10. Johnson A, Roberts L, Elkins G. Complementary and Alternative Medicine for Menopause. *J Evid Based Integr Med*. 2019;24:1-14.
11. Health Canada. Canadian Tobacco, Alcohol and Drugs (CTADS) Survey: 2017 detailed tables. 2018 [Available from: <https://www.canada.ca/en/health-canada/services/canadian-tobacco-alcohol-drugs-survey/2017-summary/2017-detailed-tables.html#t16>].
12. Rotermann M. Looking back from 2020, how cannabis use and related behaviours changed in Canada. *Health Reports*. 2021;32(no. 82-003-X):1-14.

13. Consumer Health Products Canada. Full Public Policy Position – Cannabis Regulation Ottawa, ON2019 [1-3]. Available from: <https://www.chpcanada.ca/wp-system/uploads/2019/11/Canabis-position-statement.2019.pdf>.
14. Bierut T, Krauss MJ, Sowles SJ, Cavazos-Rehg PA. Exploring Marijuana Advertising on Weedmaps, a Popular Online Directory. *Prev Sci.* 2017;18(2):183-92.
15. Bar-Lev Schleider L, Abuhasira R, Novack V. Medical cannabis: aligning use to evidence-based medicine approach. *Br J Clin Pharmacol.* 2018;84(11):2458-62.
16. Mejia-Gomez J, Phung N, Philippopoulos E, Murphy KE, Wolfman W. The impact of cannabis use on vasomotor symptoms, mood, insomnia and sexuality in perimenopausal and postmenopausal women: a systematic review. *Climacteric.* 2021:1-10.
17. Health Canada. Summary report: Consultation on potential market for health products containing cannabis that would not require practitioner oversight [Publication]. Government of Canada [updated 25 September 2020. Available from: <https://www.canada.ca/en/health-canada/services/publications/drugs-health-products/summary-report-consultation-potential-market-health-products-cannabis.html>.
18. Eysenbach G. Improving the quality of Web surveys: the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). *J Med Internet Res.* 2004;6(3):1-6.
19. Marlatt KL, Beyl RA, Redman LM. A qualitative assessment of health behaviors and experiences during menopause: A cross-sectional, observational study. *Maturitas.* 2018;116:36-42.
20. Chew LD, Bradley KA, Boyko EJ. Brief questions to identify patients with inadequate health literacy. *Family Medicine.* 2004;36(8):588-94.
21. Statistics Canada. National Cannabis Survey 2019 [cited 2019 January ]. Available from: [https://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&a=1&&lang=en&Item\\_Id=1256316](https://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&a=1&&lang=en&Item_Id=1256316).
22. Health Canada. The Canadian Cannabis Survey 2019 [updated 26 June 2019; cited 2019. Available from: <https://epe.lac-bac.gc.ca/100/200/301/pwgsc-tpsgc/por-ef/health/2019/130-18-e/report.pdf>.
23. Trenor JM, Miller MK, Gipson KG, editors. Utilization of a think-aloud protocol to cognitively validate a survey instrument identifying social capital resources of engineering undergraduates. 2011 ASEE Annual Conference & Exposition; 2011.

24. Tourangeau R. Cognitive sciences and survey methods. Washington, DC1984. 73-100 p.
25. Statistics Canada. National Cannabis Survey, second quarter 2019 2019 [Available from: <https://www150.statcan.gc.ca/n1/en/daily-quotidien/190502/dq190502a-eng.pdf?st=odG3aEbr>.
26. Turna J, Balodis I, Munn C, Van Ameringen M, Busse J, MacKillop J. Overlapping patterns of recreational and medical cannabis use in a large community sample of cannabis users. *Compr Psychiatry*. 2020;102:152188.
27. Health Canada. ARCHIVED – market data under the Access to Cannabis for Medical Purposes Regulations Government of Canada [updated 29 August 2019. Available from: <https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/licensed-producers/market-data.html>.
28. Health Canada. Data on cannabis for medical purposes Government of Canada: Health Canada; [updated 15 June 2021; cited 2021 15 July]. Available from: <https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/research-data/medical-purpose.html>.
29. Rotermann M. What has changed since cannabis was legalized? *Health Reports*. 2020;31(2):11-20.
30. Bremer E, Jallo N, Rodgers B, Kinser P, Dautovich N. Anxiety in Menopause: A Distinctly Different Syndrome? *The Journal for Nurse Practitioners*. 2019;15(5):374-8.
31. Corsi DJ, Murphy MSQ, Cook J. The Effects of Cannabis on Female Reproductive Health Across the Life Course. *Cannabis and Cannabinoid Research*. 2020;6(4):275-87.
32. BDS Analytics. Women Regularly Choose Cannabis to Take Control of Their Health [Website]. BDS Analytics2017 [updated 19 December 2017. Available from: <https://shop.bdsa.com/press-old/women-regularly-choose-cannabis-to-take-control-of-their-health/>.
33. Choi S, Huang BC, Gamaldo CE. Therapeutic Uses of Cannabis on Sleep Disorders and Related Conditions. *J Clin Neurophysiol*. 2020;37(1):39-49.
34. Osborn LA, Lauritsen KJ, Cross N, Davis AK, Rosenberg H, Bonadio F, et al. Self-Medication of Somatic and Psychiatric Conditions Using Botanical Marijuana. *J Psychoactive Drugs*. 2015;47(5):345-50.

35. Armour M, Sinclair J, Chalmers KJ, Smith CA. Self-management strategies amongst Australian women with endometriosis: a national online survey. *BMC Complement Altern Med*. 2019;19(1):17.
36. Westfall RE, Janssen PA, Lucas P, Capler R. Survey of medicinal cannabis use among childbearing women: patterns of its use in pregnancy and retroactive self-assessment of its efficacy against 'morning sickness'. *Complement Ther Clin Pract*. 2006;12(1):27-33.
37. Russo E. Cannabis Treatments in Obstetrics and Gynecology: A Historical Review. *Journal of Cannabis Therapeutics*. 2002;2(3-4):5-35.
38. Touw M. The religious and medicinal uses of Cannabis in China, India and Tibet. *J Psychoactive Drugs*. 1981;13(1):23-34.
39. Slavin MN, Farmer S, Earleywine M. Expectancy mediated effects of marijuana on menopause symptoms. *Addiction Research & Theory*. 2016;24(4):322-9.
40. Gibson C, Huang A, Maguen S, Inslicht S, Byers A, editors. Cannabis use for menopause symptom management among midlife women Veterans. 2020 Virtual Annual Meeting of the North American Menopause Society (NAMS); 2020; Virtual2020.
41. Fantry LE, Zhan M, Taylor GH, Sill AM, Flaws JA. Age of menopause and menopausal symptoms in HIV-infected women. *AIDS Patient Care & STDs*. 2005;19(11):703-11.
42. Ogborne AC, Smart RG, Adlaf E. Self-reported medical use of marijuana: a survey of the general population. *Canadian Medical Association Journal*. 2000;162:1685-6.
43. Weinberger AH, Delnevo CD, Wyka K, Gbedemah M, Lee J, Copeland J, et al. Cannabis Use Is Associated With Increased Risk of Cigarette Smoking Initiation, Persistence, and Relapse Among Adults in the United States. *Nicotine Tob Res*. 2020;22(8):1404-8.
44. Hamilton HA, Brands B, Ialomiteanu AR, Mann RE. Therapeutic use of cannabis: Prevalence and characteristics among adults in Ontario, Canada. *Can J Public Health*. 2017;108(3):e282-e7.
45. Posadzki P, Lee MS, Moon TW, Choi TY, Park TY, Ernst E. Prevalence of complementary and alternative medicine (CAM) use by menopausal women: a systematic review of surveys. *Maturitas*. 2013;75(1):34-43.
46. National Academies of Sciences E, and Medicine,. In: Jackson LM, Parker RM, Mattison DR, editors. *The Clinical Utility of Compounded Bioidentical Hormone Therapy: A Review of Safety, Effectiveness, and Use*. Washington (DC)2020.



47. Reid R, Abramson BL, Blake J, Desindes S, Dodin S, Johnston S, et al. Chapter 9: Managing Menopause Chapter 9 Complementary and Alternative Medicine (CAM). *Journal of Obstetrics and Gynaecology Canada*. 2014;36(9):S74-S80.
48. Ma J, Drieling R, Stafford RS. US women desire greater professional guidance on hormone and alternative therapies for menopause symptom management. *Menopause*. 2006;13(3):506-16.
49. Yuksel N, Treseng L, Malik B, Ogbogu U. Promotion and marketing of bioidentical hormone therapy on the internet: a content analysis of websites. *Menopause*. 2017;24(10):1129-35.
50. Bottorff JL, Bissell LJ, Balneaves LG, Oliffe JL, Capler NR, Buxton J. Perceptions of cannabis as a stigmatized medicine: a qualitative descriptive study. *Harm Reduction Journal*. 2013;10(1):1-10.
51. Ng JY, Gilotra K, Usman S, Chang Y, Busse JW. Attitudes toward medical cannabis among family physicians practising in Ontario, Canada: a qualitative research study. *CMAJ Open*. 2021;9(2):E342-E8.
52. Christensen VA, Nugent SM, Ayers CK, Morasco BJ, Kansagara D. A qualitative study of VHA clinicians' knowledge and perspectives on cannabis for medical purposes. *Fam Pract*. 2021;38(4):479-83.
53. Soares CN, Taylor V. Effects and Management of the Menopausal Transition in Women With Depression and Bipolar Disorder. *Journal of Clinical Psychiatry*. 2007;68:16-21.

### Chapter 3 References

1. Santoro N, Roeca C, Peters BA, Neal-Perry G. The Menopause Transition: Signs, Symptoms, and Management Options. *J Clin Endocrinol Metab.* 2021;106(1):1-15.
2. El Khoudary SR, Greendale G, Crawford SL, Avis NE, Brooks MM, Thurston RC, et al. The menopause transition and women's health at midlife: a progress report from the Study of Women's Health Across the Nation (SWAN). *Menopause.* 2019;26:1213-27.
3. The North American Menopause Society. The 2017 hormone therapy position statement of The North American Menopause Society. *Menopause.* 2017;24(7):728-53.
4. Minkin MJ. Menopause: Hormones, Lifestyle, and Optimizing Aging. *Obstetrics and Gynecology Clinics of North America.* 2019;46(3):501-14.
5. Soares CN, Taylor V. Effects and Management of the Menopausal Transition in Women With Depression and Bipolar Disorder. *Journal of Clinical Psychiatry.* 2007;68:16-21.
6. Posadzki P, Lee MS, Moon TW, Choi TY, Park TY, Ernst E. Prevalence of complementary and alternative medicine (CAM) use by menopausal women: a systematic review of surveys. *Maturitas.* 2013;75(1):34-43.
7. Johnson A, Roberts L, Elkins G. Complementary and Alternative Medicine for Menopause. *J Evid Based Integr Med.* 2019;24:1-14.
8. Seidl MM, Stewart DE. Alternative treatments for menopausal symptoms. Qualitative study of women's experiences. *Canadian Family Physician.* 1998;44:1271.
9. Ma J, Drieling R, Stafford RS. US women desire greater professional guidance on hormone and alternative therapies for menopause symptom management. *Menopause.* 2006;13(3):506-16.
10. Rotermann M. Looking back from 2020, how cannabis use and related behaviours changed in Canada. *Health Reports.* 2021;32(no. 82-003-X):1-14.
11. Consumer Health Products Canada. Full Public Policy Position – Cannabis Regulation Ottawa, ON2019 [1-3]. Available from: <https://www.chpcanada.ca/wp-system/uploads/2019/11/Canabis-position-statement.2019.pdf>.
12. Bierut T, Krauss MJ, Sowles SJ, Cavazos-Rehg PA. Exploring Marijuana Advertising on Weedmaps, a Popular Online Directory. *Prev Sci.* 2017;18(2):183-92.
13. Health Canada. Information for Health Care Professionals: Cannabis (marihuana, marijuana) and the cannabinoids Health Canada2018 [updated Oct 2018; cited 2021 18 May].

Available from: <https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/information-medical-practitioners/information-health-care-professionals-cannabis-cannabinoids.html#a4.0>.

14. Health Canada. Summary report: Consultation on potential market for health products containing cannabis that would not require practitioner oversight [Publication]. Government of Canada [updated 25 September 2020. Available from: <https://www.canada.ca/en/health-canada/services/publications/drugs-health-products/summary-report-consultation-potential-market-health-products-cannabis.html>.
15. Mejia-Gomez J, Phung N, Philippopoulos E, Murphy KE, Wolfman W. The impact of cannabis use on vasomotor symptoms, mood, insomnia and sexuality in perimenopausal and postmenopausal women: a systematic review. *Climacteric*. 2021;1-10.
16. BDS Analytics. Women Regularly Choose Cannabis to Take Control of Their Health [Website]. BDS Analytics2017 [updated 19 December 2017. Available from: <https://shop.bdsa.com/press-old/women-regularly-choose-cannabis-to-take-control-of-their-health/>.
17. Neergaard MA, Olesen F, Andersen RS, Sondergaard J. Qualitative description - the poor cousin of health research? *BMC Med Res Methodol*. 2009;9:52.
18. Bradshaw C, Atkinson S, Doody O. Employing a Qualitative Description Approach in Health Care Research. *Global Qualitative Nursing Research*. 2017;4:1-8.
19. Sullivan-Bolyai S, Bova C, Harper D. Developing and refining interventions in persons with health disparities: the use of qualitative description. *Nurs Outlook*. 2005;53(3):127-33.
20. Creswell JW, Plano Clark VL. *Designing and Conducting Mixed Methods Research*. 3rd ed. Los Angeles: SAGE Publications; 2017. 492 p.
21. Tong A, Sainsbury P, Craig J. Consolidate criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007;19(6):349-57.
22. Sandelowski M. Sample size in qualitative research. *Research in nursing & health*. 1995;18(2):179-83.
23. McGrath C, Palmgren PJ, Liljedahl M. Twelve tips for conducting qualitative research interviews. *Med Teach*. 2019;41(9):1002-6.

24. Mahadeen AI, Halabi JO, Callister LC. Menopause: a qualitative study of Jordanian women's perceptions. *International Nursing Review*. 2008;55:427-33.
25. Hall L, Callister LC, Berry JA, Matsumura G. Meanings of menopause: Cultural influences on perception and management of menopause. *Journal of Holistic Nursing*. 2007;25(2):106-18.
26. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res*. 2005;15(9):1277-88.
27. Erlingsson C, Brysiewicz P. A hands-on guide to doing content analysis. *Afr J Emerg Med*. 2017;7(3):93-9.
28. Lincoln YS, Guba EG. But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New directions for program evaluation*. 1986;1986(30):73-84.
29. Lincoln YS, Guba EG. *Naturalistic inquiry*: sage; 1985.
30. Berger R. Now I see it, now I don't: researcher's position and reflexivity in qualitative research. *Qualitative Research*. 2013;15(2):219-34.
31. Simon JA, Reape KZ. Understanding the menopausal experiences of professional women. *Menopause*. 2009;16(1):73-6.
32. Marlatt KL, Beyl RA, Redman LM. A qualitative assessment of health behaviors and experiences during menopause: A cross-sectional, observational study. *Maturitas*. 2018;116:36-42.
33. Yeganeh L, Boyle J, Teede H, Vincent A. Knowledge and attitudes of health professionals regarding menopausal hormone therapies. *Climacteric*. 2017;20(4):348-55.
34. Owens G. Gender differences in health care expenditures, resource utilization, and quality of care. *Journal of Managed Care Pharmacy*. 2008;14(3):2-6.
35. Corsi DJ, Murphy MSQ, Cook J. The Effects of Cannabis on Female Reproductive Health Across the Life Course. *Cannabis and Cannabinoid Research*. 2020;6(4):275-87.
36. Koyuncu T, Unsal A, Arslantas D. Evaluation of the effectiveness of health education on menopause symptoms and knowledge and attitude in terms of menopause. *Journal of epidemiology and global health*. 2018;8(1-2):8.
37. Yuksel N, Treseng L, Malik B, Ogbogu U. Promotion and marketing of bioidentical hormone therapy on the internet: a content analysis of websites. *Menopause*. 2017;24(10):1129-35.

38. Fishman JR, Flatt MA, Settersten RA, Jr. Bioidentical hormones, menopausal women, and the lure of the "natural" in U.S. anti-aging medicine. *Soc Sci Med*. 2015;132:79-87.
39. Thompson JJ, Ritenbaugh C, Nichter M. Why women choose compounded bioidentical hormone therapy: lessons from a qualitative study of menopausal decision-making. *BMC Womens Health*. 2017;17(97):1-18.
40. Chang JC, Tarr JA, Holland CL, De Genna NM, Richardson GA, Rodriguez KL, et al. Beliefs and attitudes regarding prenatal marijuana use: Perspectives of pregnant women who report use. *Drug Alcohol Depend*. 2019;196:14-20.
41. McCrea FB. The politics of menopause: The "discovery" of a deficiency disease. *Social problems*. 1983;31(1):111-23.
42. Stringer RJ, Maggard SR. Reefer Madness to Marijuana Legalization. *Journal of Drug Issues*. 2016;46(4):428-45.
43. Bottorff JL, Bissell LJ, Balneaves LG, Oliffe JL, Capler NR, Buxton J. Perceptions of cannabis as a stigmatized medicine: a qualitative descriptive study. *Harm Reduction Journal*. 2013;10(1):1-10.

## Chapter 4 References

1. Simon JA, Reape KZ. Understanding the menopausal experiences of professional women. *Menopause*. 2009;16(1):73-6.
2. Minkin MJ. Menopause: Hormones, Lifestyle, and Optimizing Aging. *Obstetrics and Gynecology Clinics of North America*. 2019;46(3):501-14.
3. El Khoudary SR, Greendale G, Crawford SL, Avis NE, Brooks MM, Thurston RC, et al. The menopause transition and women's health at midlife: a progress report from the Study of Women's Health Across the Nation (SWAN). *Menopause*. 2019;26:1213-27.
4. Hall L, Callister LC, Berry JA, Matsumura G. Meanings of menopause: Cultural influences on perception and management of menopause. *Journal of Holistic Nursing*. 2007;25(2):106-18.
5. Obermeyer CM. Menopause across cultures: a review of the evidence. *Menopause*. 2000;7(3):184-92.
6. Rotermann M. Looking back from 2020, how cannabis use and related behaviours changed in Canada. *Health Reports*. 2021;32(no. 82-003-X):1-14.
7. Consumer Health Products Canada. Full Public Policy Position – Cannabis Regulation Ottawa, ON2019 [1-3]. Available from: <https://www.chpcanada.ca/wp-system/uploads/2019/11/Canabis-position-statement.2019.pdf>.
8. Eysenbach G. Improving the quality of Web surveys: the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). *J Med Internet Res*. 2004;6(3):1-6.
9. Costanian C, McCague H, Tamim H. Age at natural menopause and its associated factors in Canada: cross-sectional analyses from the Canadian Longitudinal Study on Aging. *Menopause*. 2018;25(3):265-72.
10. Gold EB, Bromberger J, Crawford S, Samuels S, Greendale GA, Harlow SD, et al. Factors Associated with Age at Natural Menopause in a Multiethnic Sample of Midlife Women. *American Journal of Epidemiology*. 2001;153(9):865-74.
11. Soares CN, Taylor V. Effects and Management of the Menopausal Transition in Women With Depression and Bipolar Disorder. *Journal of Clinical Psychiatry*. 2007;68:16-21.
12. Mejia-Gomez J, Phung N, Philippopoulos E, Murphy KE, Wolfman W. The impact of cannabis use on vasomotor symptoms, mood, insomnia and sexuality in perimenopausal and postmenopausal women: a systematic review. *Climacteric*. 2021:1-10.

13. Slavin MN, Farmer S, Earleywine M. Expectancy mediated effects of marijuana on menopause symptoms. *Addiction Research & Theory*. 2016;24(4):322-9.
14. Posadzki P, Lee MS, Moon TW, Choi TY, Park TY, Ernst E. Prevalence of complementary and alternative medicine (CAM) use by menopausal women: a systematic review of surveys. *Maturitas*. 2013;75(1):34-43.
15. Ogborne AC, Smart RG, Adlaf E. Self-reported medical use of marijuana: a survey of the general population. *Canadian Medical Association Journal*. 2000;162:1685-6.
16. Turna J, Balodis I, Munn C, Van Ameringen M, Busse J, MacKillop J. Overlapping patterns of recreational and medical cannabis use in a large community sample of cannabis users. *Compr Psychiatry*. 2020;102:152188.
17. Hamilton HA, Brands B, Ialomiteanu AR, Mann RE. Therapeutic use of cannabis: Prevalence and characteristics among adults in Ontario, Canada. *Can J Public Health*. 2017;108(3):e282-e7.
18. Tong A, Sainsbury P, Craig J. Consolidate criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007;19(6):349-57.
19. Seidl MM, Stewart DE. Alternative treatments for menopausal symptoms. Qualitative study of women's experiences. *Canadian Family Physician*. 1998;44:1271.
20. Thompson JJ, Ritenbaugh C, Nichter M. Why women choose compounded bioidentical hormone therapy: lessons from a qualitative study of menopausal decision-making. *BMC Womens Health*. 2017;17(97):1-18.
21. Fishman JR, Flatt MA, Settersten RA, Jr. Bioidentical hormones, menopausal women, and the lure of the "natural" in U.S. anti-aging medicine. *Soc Sci Med*. 2015;132:79-87.
22. Creswell JW, Plano Clark VL. *Designing and Conducting Mixed Methods Research*. 3rd ed. Los Angeles: SAGE Publications; 2017. 492 p.
23. Ma J, Drieling R, Stafford RS. US women desire greater professional guidance on hormone and alternative therapies for menopause symptom management. *Menopause*. 2006;13(3):506-16.
24. Zare-Farashbandi F, Lalazaryan A. A Review of models and theories of health information seeking behavior. *International Journal of Health System and Disaster Management*. 2014;2(4).

25. Longo DR. Understanding health information, communication, and information seeking of patients and consumers: a comprehensive and integrated model. *Health Expectations*. 2005;8(3):189-94.
26. Longo DR, Schubert SL, Wright BA, LeMaster J, Williams CD, Clore JN. Health information seeking, receipt, and use in diabetes self-management. *Ann Fam Med*. 2010;8(4):334-40.
27. Berger R. Now I see it, now I don't: researcher's position and reflexivity in qualitative research. *Qualitative Research*. 2013;15(2):219-34.
28. Ng JY, Gilotra K, Usman S, Chang Y, Busse JW. Attitudes toward medical cannabis among family physicians practising in Ontario, Canada: a qualitative research study. *CMAJ Open*. 2021;9(2):E342-E8.
29. Christensen VA, Nugent SM, Ayers CK, Morasco BJ, Kansagara D. A qualitative study of VHA clinicians' knowledge and perspectives on cannabis for medical purposes. *Fam Pract*. 2021;38(4):479-83.
30. Yeganeh L, Boyle J, Teede H, Vincent A. Knowledge and attitudes of health professionals regarding menopausal hormone therapies. *Climacteric*. 2017;20(4):348-55.
31. Christianson MS, Ducie JA, Altman K, Khafagy AM, Shen W. Menopause education: needs assessment of American obstetrics and gynecology residents. *Menopause*. 2013;20(11):1120-5.
32. The North American Menopause Society. Menopause Health Questionnaire 2005 [Available from: <https://www.menopause.org/publications/clinical-practice-materials/menopause-health-questionnaire>].
33. Aninye IO, Laitner MH, Chinnappan S, Society for Women's Health Research Menopause Working G. Menopause preparedness: perspectives for patient, provider, and policymaker consideration. *Menopause*. 2021.
34. Mahadeen AI, Halabi JO, Callister LC. Menopause: a qualitative study of Jordanian women's perceptions. *International Nursing Review*. 2008;55:427-33.
35. Health Canada. Cannabis for medical purposes under the Cannabis Act: information and improvements Government of Canada 2021 [updated 19 May 2021; cited 2021 20 August]. Available from: <https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/medical-use-cannabis.html>.



36. Hilditch JR, Lewis J, Peter A, van Maris B, Ross A, Franssen E, et al. A menopause-specific quality of life questionnaire: development and psychometric properties. *Maturitas*. 1996;24(6):161-75.
37. Sydora BC, Fast H, Campbell S, Yuksel N, Lewis JE, Ross S. Use of the Menopause-Specific Quality of Life (MENQOL) questionnaire in research and clinical practice: a comprehensive scoping review. *Menopause*. 2016;23(9):1038-51.
38. Health Canada. The Canadian Cannabis Survey 2019 [updated 26 June 2019; cited 2019]. Available from: <https://epe.lac-bac.gc.ca/100/200/301/pwgsc-tpsgc/por-ef/health/2019/130-18-e/report.pdf>.
39. Statistics Canada. National Cannabis Survey 2019 [cited 2019 January ]. Available from: [https://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&a=1&&lang=en&Item\\_Id=1256316](https://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&a=1&&lang=en&Item_Id=1256316).
40. Hill CD, Fehnel SE, Bobula JD, Yu H, McLeod LD. Development and preliminary validation of the Menopause Symptoms Treatment Satisfaction Questionnaire (MS-TSQ). *Menopause*. 2007;14(6):1047-55.
41. Lillie EO, Patay B, Diamant J, Issell B, Topol EJ, Schork NJ. The n-of-1 clinical trial: the ultimate strategy for individualizing medicine? *Personalized medicine*. 2011;8(2):161-73.
42. Notcutt W, Price M, Miller R, Newport S, Phillips C, Simmons S, et al. Initial experiences with medicinal extracts of cannabis for chronic pain: results from 34 ‘N of 1’ studies. *Anaesthesia*. 2004;59(5):440-52.
43. Timler A, Bulsara C, Bulsara M, Vickery A, Smith J, Codde J. Use of cannabinoid-based medicine among older residential care recipients diagnosed with dementia: study protocol for a double-blind randomised crossover trial. *Trials*. 2020;21(1):188.

## APPENDICES

### Appendix A. Checklist for Reporting Results of Internet E-Surveys (CHERRIES)\*

No.	Checklist Item	Explanation/Description	Description	Section
1.	Describe survey design	Describe target population, sample frame. Is the sample a convenience sample? (In “open” surveys this is most likely.)	Women, ages 35 and over, currently living in Alberta  Convenience sampling through use of publicly available link to survey	2.2.2 Participants and Recruitment
2.	IRB approval	Mention whether the study has been approved by an IRB.	Ethics approval was granted by the Research Ethics Board at the University of Alberta (#Pro00100591)	2.2.1 Study Design
3.	Informed consent	Describe the informed consent process. Where were the participants told the length of time of the survey, which data were stored and where and for how long, who the investigator was, and the purpose of the study?	Survey link initially brought all survey respondents to short study description and screening questions based on study inclusion criteria. Eligible survey respondents then received access to review the complete study information letter approved by the ethics board (containing information on study purpose, length, data storage, privacy and confidentiality information). Informed consent was provided by a survey respondent who proceeded to the next section of the survey upon reviewing through the whole study information letter.	2.2.2 Participants and Recruitment
4.	Data protection	If any personal information was collected or stored, describe what mechanisms were used to protect unauthorized access.	Password protected secure browser data collection tool, Qualtrics, supported by the Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta  Qualtrics servers are protected by Web Application Firewalls and employs Intrusion Detection System (IDS) monitor unauthorized uses.	2.2.2 Participants and Recruitment
5.	Development and testing	State how the survey was developed, including whether the usability and technical functionality of the electronic questionnaire had been	The survey was developed in Qualtrics.  The online survey had been pilot tested in a group of women (n=10) of the target population	2.2.3 Survey Instrument

		tested before fielding the questionnaire.	for face validity and comprehensibility (University of Alberta Research Ethics Board Study ID #Pro00100595) prior to fielding the survey.	
6.	Open survey versus closed survey	An “open survey” is a survey open for each visitor of a site, while a closed survey is only open to a sample which the investigator knows (password-protected survey).	The survey was created as an “open-access”, cross-sectional, population-based survey	2.2.2 Participants and Recruitment
7.	Contact mode	Indicate whether or not the initial contact with the potential participants was made on the Internet. (Investigators may also send out questionnaires by mail and allow for Web-based data entry.)	URL link to study distributed through recruitment ads/posts made on online social media platforms (Facebook, Twitter, Instagram) and made shareable	2.2.2 Participants and Recruitment
8.	Advertising the survey	How/where was the survey announced or advertised?	Recruitment was done through online methods only through use of targeted advertisement campaigns and user-shared public social media posts on Facebook, Twitter, and Instagram.	2.2.2 Participants and Recruitment  See Appendix B for example of recruitment ad
9.	Web/E-mail	State the type of e-survey (eg, one posted on a Web site, or one sent out through e-mail).	Online survey developed in Qualtrics	2.2.3 Survey Development
10.	Context	Describe the Web site (for mailing list/newsgroup) in which the survey was posted. What is the Web site about, who is visiting it, what are visitors normally looking for?	Link to survey was posted on publicly visible study-specific user pages that had a description of “University of Alberta research-specific account currently exploring experiences in midlife women’s health”	2.2.2 Participants and Recruitment
11.	Mandatory/voluntary	Was it a mandatory survey to be filled in by every visitor who wanted to enter the Web site, or was it a voluntary survey?	Voluntary survey participation	2.2.2 Participants and Recruitment
12.	Incentives	Were any incentives offered?	Yes, all survey participants were offered the chance to enter a raffle draw for 1 of 4 \$50 gift cards.	2.2.2 Participants and Recruitment

13.	Time/Date	In what timeframe were the data collected?	Data collection took place over a two-month period between October 2020 and December 2020.	2.2.2 Participants and Recruitment
14.	Randomization of items or questionnaires	To prevent biases items can be randomized or alternated.	N/A	N/A
15.	Presence of non-participants	Was anyone else present besides the participants and researchers?	Survey was self-administered	2.2.3 Survey Instrument
16.	Adaptive questioning	Use adaptive questioning (certain items, or only conditionally displayed based on responses to other items) to reduce number and complexity of the questions.	Adaptive questioning (in the form of branching logic) was applied to question regarding cannabis use characteristics, categorizing current, past and never users and related responses to questions.	2.2.3.1 Questionnaire
17.	Number of Items	What was the number of questionnaire items per page?	Up to 10 questions	N/A
18.	Number of screens (pages)	Over how many pages was the questionnaire distributed?	Over 10 web browser pages.	N/A
19.	Completeness check	It is technically possible to do consistency or completeness checks before the questionnaire is submitted. Was this done, and if “yes”, how (usually JavaScript)? An alternative is to check for completeness after the questionnaire has been submitted (and highlight mandatory items).	“Prefer not to Answer” was a response option  Validation for missed questions was applied to the survey questions, survey responder was informed at the end of the section if any questions had been missed.	Appendix C. Survey Questionnaire
20.	Review step	State whether respondents were able to review and change their answers.	“Back” arrow button was available as a survey respondent progressed through the questionnaire. No review step was incorporated into the questionnaire prior to submission	N/A
21.	Unique site visitor	If you provide view rates or participation rates, you need to define how you determined a unique visitor. There are different techniques available, based on IP addresses or cookies or both.	Utilized Qualtrics’ integrated “Prevent ballot box stuffing” setting to prevent multiple submissions (Places a cookie on respondent’s browser)	N/A
22.	View rate (Ratio of unique survey)	Requires counting unique visitors to the first page of	N/A	N/A

	visitors/unique site visitors)	the survey, divided by the number of unique site visitors (not page views!). It is not unusual to have view rates of less than 0.1 % if the survey is voluntary.		
23.	Participation rate (Ratio of unique visitors who agreed to participate/unique first survey page visitors)	Count the unique number of people who filled in the first survey page (or agreed to participate, for example by checking a checkbox), divided by visitors who visit the first page of the survey (or the informed consents page, if present). This can also be called “recruitment” rate.	N/A	N/A
24.	Completion rate (Ratio of users who finished the survey/users who agreed to participate)	The number of people submitting the last questionnaire page, divided by the number of people who agreed to participate (or submitted the first survey page). This is only relevant if there is a separate “informed consent” page or if the survey goes over several pages.	A total of 1,376 (completion rate of 92.7%) of the 1,485 survey participants finished the survey to 100% completion.	2.3.1 Demographics and Clinical Characteristics
25.	Cookies used	Indicate whether cookies were used to assign a unique user identifier to each client computer.	Utilized Qualtrics’ integrated “Prevent ballot box stuffing” setting to prevent multiple submissions (Places a cookie on respondent’s browser)	N/A
26.	IP check	Indicate whether the IP address of the client computer was used to identify potential duplicate entries from the same user.	Disabled the collection of IP address information by selecting Qualtrics’ integrated setting “Anonymize Response” in Survey Options	N/A
27.	Log file analysis	Indicate whether other techniques to analyze the log file for identification of multiple entries were used. If so, please describe.	Utilized Qualtrics’ integrated “Prevent ballot box stuffing” setting to prevent multiple submissions (Places a cookie on respondent’s browser); Survey raffle form was only accessible through those who were linked from the main survey form through Qualtrics’ setting of HTTP Referer Verification (prevented external/multiple raffle draw entries)	N/A

28.	Registration	In “closed” (non-open) surveys, users need to login first and it is easier to prevent duplicate entries from the same user. Describe how this was done. Not applicable - Survey was open	N/A	N/A
29.	Handling of incomplete questionnaires	Were only completed questionnaires analyzed? Were questionnaires which terminated early (where, for example, users did not go through all questionnaire pages) also analyzed?	All responses that proceeded beyond the informed consent page were included for data analysis, which was determined to be completing > 20% survey completion (as per Qualtrics’ completion status bar)	N/A
30.	Questionnaires submitted with an atypical timestamp	Some investigators may measure the time people needed to fill in a questionnaire and exclude questionnaires that were submitted too soon. Specify the timeframe that was used as a cut-off point, and describe how this point was determined.	All responses that surpassed the pre-determined survey completion % (proceeded beyond informed consent page) were included in the final sample for data analysis regardless of atypical timestamp.	N/A
31.	Statistical correction	Indicate whether any methods such as weighting of items or propensity scores have been used to adjust for the non-representative sample; if so, please describe the methods.	N/A	N/A

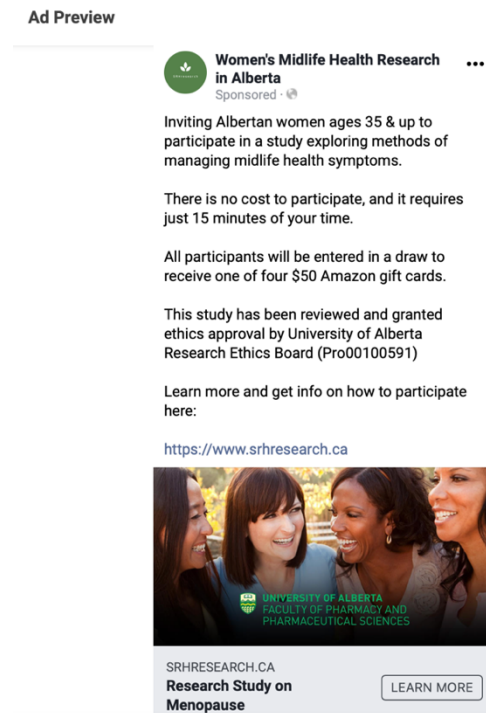
\*This checklist has been modified from Eysenbach G. Improving the quality of Web surveys: the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). J Med Internet Res. 2004 Sep 29;6(3):e34 [erratum in J Med Internet Res. 2012; 14(1): e8.]. Article available at <https://www.jmir.org/2004/3/e34/>; erratum available <https://www.jmir.org/2012/1/e8/>. Copyright ©Gunther Eysenbach. Originally published in the [Journal of Medical Internet Research](#), 29.9.2004 and 04.01.2012.

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## Appendix B. Recruitment Advertisements used on Social Media



Sample Twitter post for study recruitment (similar ad posted on Instagram)



Sample Facebook advertisement used for study recruitment

## Appendix C. Survey Questionnaire

### *Screening Questions:*

1. Do you live in Alberta?
  - Yes
  - No
  
2. Do you biologically identify as a woman?
  - Yes
  - No
  
3. Are you 35 years of age and older?
  - Yes
  - No

*If “Yes” to Screening Questions 1-3, participant proceeds to next section including the “Study Information Letter” & consent process. If consent provided electronically, participant proceeds to survey questions.*

*If “No” to one or more Screening Questions, survey terminates.*

### *Survey Questions:*

#### **DEMOGRAPHICS**

- Q1. Where did you find out about our research study? (please select all that apply)
- From a healthcare provider
  - From a friend or family member
  - Facebook
  - Twitter
  - Instagram
  - Other: (please specify)
- Q2. What is your current age? \_\_\_\_\_
- Q3. Which best describes your race/ethnicity? (please select all that apply)
- White
  - South Asian
  - Asian
  - Indigenous
  - Black
  - Arab
  - Other: (please specify)
  - Prefer not to answer



- Q4. Which best describes your highest level of education attained?
- Less than high school degree
  - High school degree or equivalent
  - Post-secondary education (college/technical, Bachelor's degree)
  - Graduate education (Master's degree or higher)
  - Other: (please specify)
  - Prefer not to answer
- Q5. What region of Alberta do you currently reside?
- Northern Alberta (including Fort McMurray and Grande Prairie)
  - Edmonton and area
  - Central Alberta (including Red Deer)
  - Calgary and area
  - Southern Alberta (including Lethbridge and Medicine Hat)
  - Prefer not to answer

### ***MEDICAL HISTORY AND MENOPAUSE QUESTIONS***

- Q6. How would you describe your overall health right now?
- Good
  - Neutral
  - Poor
  - Prefer not to answer
- Q7. Do you have a history of any of the following medical conditions? (please select all that apply)
- High blood pressure
  - Heart disease (for example: previous heart attack, atrial fibrillation, heart failure)
  - Stroke
  - Diabetes
  - Respiratory disorders (for example: asthma, COPD)
  - Migraines
  - Neurological disease (for example: multiple sclerosis, seizures)
  - Osteoporosis
  - Breast cancer
  - Other cancer: (please specify)
  - Other: (please specify)
  - None
  - Prefer not to answer
- Q8. Do you currently smoke tobacco cigarettes?
- Yes, I currently smoke
  - No, but I have previously smoked
    - (How many years ago did you quit?: \_\_\_\_\_)

- No, I have never smoked
- Prefer not to answer

Q9. Have you had a hysterectomy, “uterus surgically removed”?

- Yes
- No
- Prefer not to answer

Q10. Have you had a bilateral oophorectomy, “both ovaries surgically removed”?

- Yes
- No
- Prefer not to answer

Q11. Please select which statement best describes your menopausal stage:

- My periods are regular, and I have not yet experienced menopausal symptoms.
- My periods are regular, and I am currently experiencing menopausal symptoms.
- My periods have become irregular, and I am currently experiencing menopausal symptoms.
- It has been more than 12 months since my last menstrual period, and I may or may not currently have menopausal symptoms.
- Other: (please describe) \_\_\_\_\_
- Prefer not to answer

Q12. In the last 30 days, have you experienced any of the following symptoms related to menopause? (please select all that apply)

- Hot flashes
- Night sweats
- Difficulty with sleeping
- Depression
- Irritability
- Mood swings
- Anxiety
- Difficulty with concentration or brain fog
- Muscle and joint achiness
- Vaginal dryness or itching
- Painful intercourse
- Low sex drive or libido
- Other: (please specify)
- No, I do not have any of these symptoms

Q13. Are you taking any of the following prescription medications to help with symptoms related to menopause?

- Hormone therapy (for example: estrogen or progesterone therapy)

- Hormonal contraception (for example: birth control pills, IUD)
- Antidepressants (for example: Effexor®, Pristiq®, Cipralex®, Paxil®, Zoloft®, etc.)
- Clonidine
- Gabapentin or pregabalin
- Other: (please specify)
- No, I am not taking any of these medications for symptoms related to menopause
- Prefer not to answer

Q14. What other approaches do you use to help with managing symptoms related to menopause? (please specify all that apply)

- Natural health products (for example: soy products, black cohosh, primrose oil, and others...)
- Vaginal moisturizers or lubricants
- Exercise and yoga
- Weight loss
- Acupuncture
- Mindfulness or meditation
- Cognitive behavioural therapy (CBT)
- Changing diet
- Other: (please specify)
- None of the above
- Prefer not to answer

***CANNABIS QUESTIONS***

Q15. Have you used cannabis in the last 30 days? (*Note: branching logic applied to Q15*)

- Yes
- No
- Prefer not to answer

*If “Yes” to Q15:*

***CURRENT CANNABIS USE***

Q15a1. How long have you used cannabis for?

- Less than 1 year
- 1 to 2 years
- Between 2 to 5 years
- More than 5 years
- Prefer not to answer

Q15a2. What is the main reason you use cannabis for?

- Recreational or non-medical use

*If “No” or “Prefer not to answer” to Q15:*

Q15b1. Have you used cannabis in the past?

- Yes
- No
- Prefer not to answer

*If “No” or “Prefer not to answer” to Q15b1, proceed to Q16*

*If “Yes” to Q15b1:*

***PAST CANNABIS USE***

- Medical use
- Both recreational or non-medical AND medical use
- Prefer not to answer

Q15a3. Do you have a prescription for medical cannabis written by a doctor? (also known as a “medical document” for medical cannabis)

- Yes
- No
- Prefer not to answer

Q15a4. Do you use cannabis for the management of any of the following symptoms related to menopause? (please select all that apply)

- Hot flashes
- Night sweats
- Difficulty with sleeping
- Depression
- Irritability
- Mood swings
- Anxiety
- Difficulty with concentration or brain fog
- Muscle and joint achiness
- Vaginal dryness or itching
- Painful intercourse
- Low sex drive or libido
- Other: (please specify)
- No, I do not use cannabis for any of these symptoms
- Prefer not to answer

Q15a5. Does cannabis help with managing your symptoms selected above?

- Yes
- No
- I do not know
- Does not apply to me
- Prefer not to answer

Q15a6. In what forms do you use cannabis products? (please select all that apply)

Q15b2. What was the main reason you used cannabis for?

- Recreational or non-medical use
- Medical use
- Both recreational or non-medical AND medical use
- Prefer not to answer

Q15b3. Have you ever had a prescription for medical cannabis written by a doctor? (also known as a “medical document” for medical cannabis)

- Yes
- No
- Prefer not to answer

Q15b4. Did you use cannabis for the management of any of the following symptoms related to menopause? (please select all that apply)

- Hot flashes
- Night sweats
- Difficulty with sleeping
- Depression
- Irritability
- Mood swings
- Anxiety
- Difficulty with concentration or brain fog
- Muscle and joint achiness
- Vaginal dryness or itching
- Painful intercourse
- Low sex drive or libido
- Other: (please specify)
- No, I did not use cannabis for any of these symptoms
- Prefer not to answer

Q15b5. Does cannabis help with managing your symptoms selected above?

- Yes
- No
- I do not know
- Does not apply to me
- Prefer not to answer

- Smoke (for example: joint, pipe, bong, etc.)
- Oils
- Capsules
- Edibles
- Vape
- Other: (please describe)

Q15a7. How often do you use cannabis products?

- Once daily
- 2 or 3 times daily
- 4 or more times daily
- Only as needed
- Only for recreational use
- Other: (please describe)

Q15a8. During the COVID-19 pandemic, has your cannabis use changed?

- Yes, I have increased how much cannabis I take
- Yes, I have decreased how much cannabis I take
- No, my cannabis use has not changed
- Prefer not to answer

Q15a9. Where do you get your cannabis products from? (please select all that apply)

- In-person cannabis stores
- Online cannabis store
- From someone you know (for example: family, friend, or someone else)
- Other: (please describe)
- Prefer not to answer

Q15a10. What type of cannabis product(s) do you use? (please select all that apply)

- CBD/THC blends or combinations
- High CBD (CBD only or with low THC)
- High THC (THC only or with low CBD)
- I do not know
- Other: (please describe)
- Prefer not to answer

Q15b6. In what forms did you use cannabis products? (please select all that apply)

- Smoke (for example: joint, pipe, bong, etc.)
- Oils
- Capsules
- Edibles
- Vape
- Other: (please describe)

Q15b7. How often did you use cannabis products?

- Once daily
- 2 or 3 times daily
- 4 or more times daily
- Only as needed
- Only for recreational use
- Other: (please describe)

Q15a8. Where did you get your cannabis products from? (please select all that apply)

- In-person cannabis stores
- Online cannabis store
- From someone you know (for example: family, friend, or someone else)
- Other: (please describe)
- Prefer not to answer

Q15b9. Why did you stop using cannabis? (please select all that apply)

- It did not work or stopped working
- Did not want to use it anymore
- Due to side effects
- Because it was illegal
- Unable to find supply
- Could not afford it
- Other: (please specify)
- Prefer not to answer

Q5b10. What type of cannabis product(s) did you use? (please select all that apply)

- CBD/THC blends or combinations
- High CBD (CBD only or with low THC)

- High THC (THC only or with low CBD)
- I do not know
- Other: (please describe)
- Prefer not to answer

### ***GENERAL CANNABIS QUESTIONS***

Q16. With cannabis now being legal in Canada, are you more likely to use cannabis?

- Yes
- No
- Maybe
- I do not know
- Prefer not to answer

Q17. Are you interested in using cannabis for menopause symptoms in the future?

- Yes
- No
- Maybe
- I do not know
- Prefer not to answer

Q18. Where do you get information about cannabis use and products? (please select all that apply)

- In-person cannabis stores
- Online cannabis stores
- Internet searches
- Social media
- Medical cannabis clinic or educator
- Physician
- Pharmacist
- Family or friends
- Other: (please describe)
- Does not apply to me
- Prefer not to answer

Q19. Are you interested in learning more about cannabis used for management of symptoms related to menopause?

- Yes
- No
- Maybe
- I do not know
- Prefer not to answer

Q20. What sort of information do you want to know more about? (please select all that apply)

- Type of cannabis (CBD vs. THC, different strains)

- Different cannabis product forms
- Cannabis dosing
- Indications (for examples: what type of symptoms cannabis can be used for)
- Side effects
- Drug interactions (for example: interaction with other prescription or over the counter medications)
- Other: (please describe)
- Does not apply to me
- Prefer not to answer

Q21. What sources would you like to receive information about cannabis from? (please select all that apply)

- In-person cannabis stores
- Online cannabis stores
- Internet searches
- Social media
- Medical cannabis clinic or educator
- Physician
- Pharmacist
- Family or friends
- Other: (please describe)
- Does not apply to me
- Prefer not to answer

Q22. Regardless of if you have or have not used cannabis, please use the space provided to type any comments you may have about taking cannabis for symptoms related to menopause:

**HEALTH LITERACY** (Adapted from Chew et al., 2004\*)

Q23. With the next 3 questions, please select the answer that best relates to you:

	Always	Often	Sometimes	Occasionally	Never
How confident are you filling out medical forms by yourself?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How often do you have problems learning about medical conditions because of difficulty understanding written information?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How often do you have someone help you read hospital materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

\*Health Literacy Questions adapted from: Chew, Bradley & Boyko. (2004) Brief questions to identify patients with inadequate health literacy. Family Medicine, 36(8), 588-594.

**FOLLOW-UP REQUEST**

Q24. Do you consent to a member of the research team contacting you to participate in a one-on-one interview in the near future?

*(note: not all participants who show interest will be contacted for follow-up interviews)*

- Yes
- No

If “No” to Q24, proceed to Q26.

If “Yes” to Q24:



Q25. Thank you for your interest to participate in a future interview!

Please provide the following contact information so that a member of the research team can contact you.

Name:	<input type="text"/>
Email Address:	<input type="text"/>
Phone Number (with area code):	<input type="text"/>

***RAFFLE ENTRY***

Q26. Would you like to enter the raffle for a chance to win 1 of four \$50 gift cards for completing this survey?

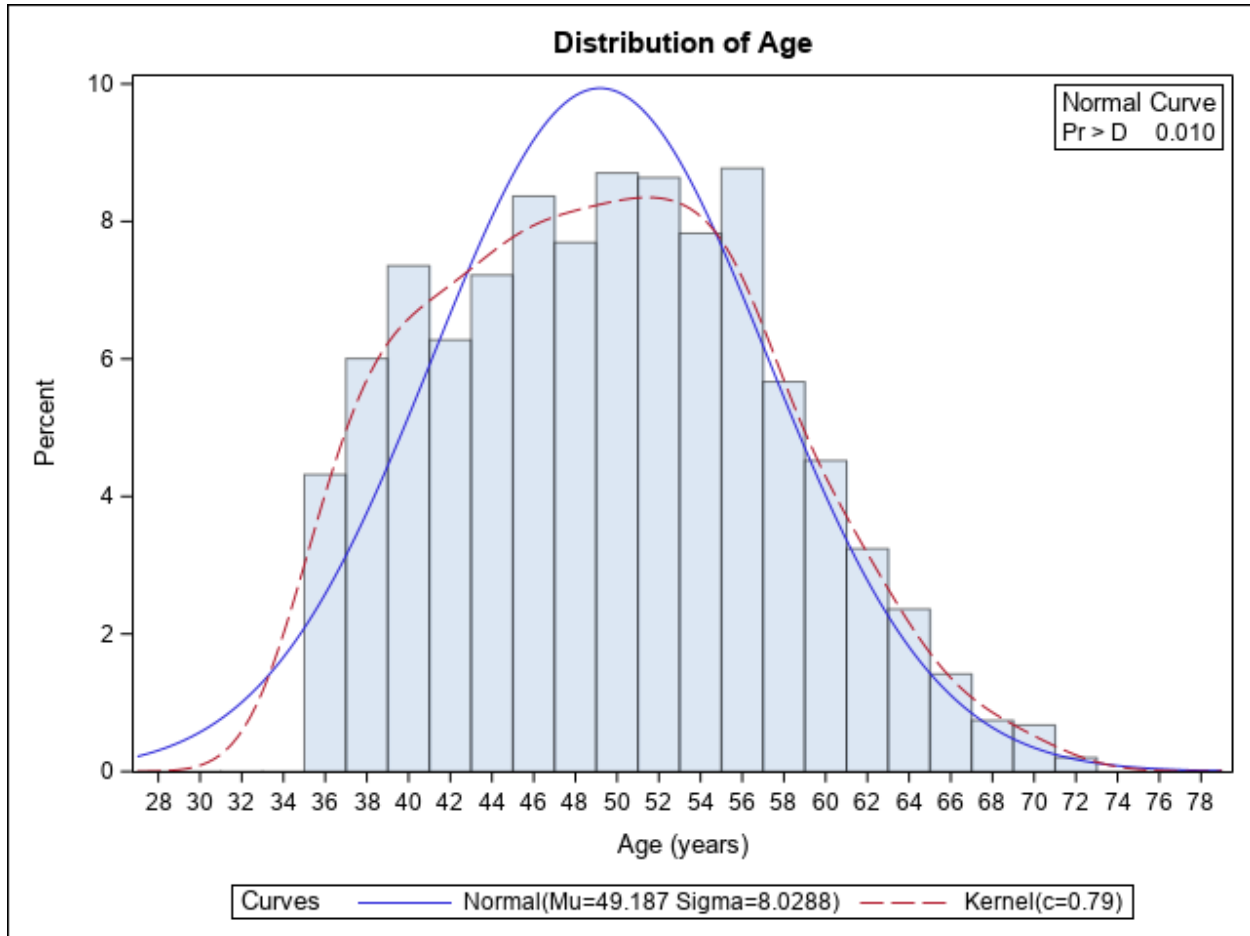
- Yes (*If "Yes, link to secondary survey form for raffle draw entry*)
- No (*If "No", survey terminates*)

## Appendix D. Categorization of Menopause Stage from Survey Responses

Pre-Defined Survey Response	Menopause Stage Categorized	Comments
“My periods are regular, and I have not yet experienced menopausal symptoms.”	Pre-menopause	N/A
“My periods are regular, and I am currently experiencing menopausal symptoms.”	Perimenopause	N/A
“My periods have become irregular, and I am currently experiencing menopausal symptoms.”		N/A
“It has been more than 12 months since my last menstrual period, and I may or may not currently have menopausal symptoms.”	Post-menopause	N/A
“Other”	Other*	<p>* Other’ responses were asked to input details in an open-text response box. All responses were reviewed individually by the research team and recategorized as follows when appropriate:</p> <p>‘Pre-menopause’:</p> <ul style="list-style-type: none"> <li>- If mention of recent pregnancy causing menstrual cycle irregularities</li> <li>- If mention regular period and presence of menopause-like symptoms related to another comorbidity</li> </ul> <p>‘Perimenopause’:</p> <ul style="list-style-type: none"> <li>- If mention any menstrual cycle irregularities or mention of a period within the last 12-months (with or without mention of menopause symptoms)</li> </ul> <p>‘Post-menopause’:</p>

		<ul style="list-style-type: none"> <li>- If mention of removal of both ovaries (bilateral oophorectomy)</li> </ul> <p>Remained as 'Other' (<i>rationale</i>):</p> <ul style="list-style-type: none"> <li>- Hysterectomy (<i>unknown when procedure took place, if menstrual cycle would still occur or if woman would be in natural menopause, unable to categorize</i>)</li> <li>- Endometrial or uterine ablation (<i>possible influence on presence/cessation of menstrual periods, unable to categorize</i>)</li> <li>- Use of hormonal contraception/intrauterine device (<i>possible influence on presence/cessation of menstrual periods, unable to categorize</i>)</li> <li>- Description only of menopause-like symptoms (<i>unknown presence/cessation of menstrual period, unable to categorize</i>)</li> <li>- Description 'always had irregular periods' (<i>unable to definitively categorize if woman in pre-menopause or perimenopause</i>)</li> </ul>
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## Appendix E. Non-parametric distribution of age



Evidence that age is not normally distributed. Measures of central tendency for continuous variables (e.g., age) were reported as median (interquartile range)

## Appendix F. Semi-Structured Interview Guide

Interview Domain	Question Item
Menopause Experience	(1) When did you start experiencing menopause symptoms? <i>Woman tells her symptoms, if not.. follow-up with:</i> (1a.) What are your current menopause symptoms? (1b.) Are you currently taking any medications to manage these symptoms? What are they? (2) How do you feel about going through menopause?
Cannabis Role (in Menopause)	(3) What role does cannabis play in your life/in your experience with menopause? (4) How did you decide to use cannabis?
Cannabis Beliefs	(5) What are your beliefs about the medical value of cannabis? (6) What are some barriers associated with using cannabis that you have experienced?
Cannabis Efficacy	(7) What effect does cannabis have on you? (7a) How does cannabis compare to other medications?
Cannabis Safety	(8) What side effects have you experienced with using cannabis? (9) Do you have any concerns with risk associated with using cannabis for managing symptoms? How would these risks compare to: (9a) prescription medications; (9b) other recreational drugs
Cannabis Administration	(10) How would you describe your use of cannabis? (10a) Where do you get your cannabis from?
Cannabis Information/Resources	(11) What sources of information do you use or look for regarding cannabis used for medical purposes? (12) Are there any resources you wish were available to you to make decisions around using cannabis for medical purposes, such as menopause? (12a) Can you explain? (12b) What role do health care professionals play in you taking cannabis? (12c) How can a health care provider better help you managing symptoms with cannabis?
Final Wrap-up Question	(13) What advice would you have to another woman who is interested in using cannabis to help with symptoms she is experiencing?

## Appendix G. Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist\*

No.	Item	Question	Description
<b>Domain 1: Research Team and Reflexivity</b>			
<i>Personal Characteristics</i>			
1.	Interviewer	Which author(s) conducted the interviews or focus groups?	<b>KB:</b> conducted all 12 one-on-one interviews <b>MQ:</b> present as note-taker for 2 of the 12 interviews
2.	Credentials	What were the researchers' credentials?	<b>KB:</b> BHSc (Honours), PharmD, MSc Student <b>MQ:</b> MSc, PhD, RD, <b>NY:</b> BScPharm, PharmD, FCSHP, NCMP
3.	Occupation	What was their occupation at the time of the study?	<b>KB:</b> Master's Student, Faculty of Pharmacy and Pharmaceutical Sciences, Pharmacist Pharmaceutical Sciences <b>MQ:</b> Qualitative Research Contractor <b>NY:</b> Professor, Pharmacist
4.	Gender	Was the researcher male or female?	All researchers identified as female
5.	Experience and training	What experience or training did the researcher have?	<b>KB:</b> Completed graduate-level coursework on qualitative research methods; received mentorship on qualitative research methodology <b>MQ:</b> Over 10 years of qualitative research experience; lead of a qualitative consulting company <b>NY:</b> Supervised previous graduate and undergraduate students on qualitative projects; conducted several qualitative research projects as principal investigator or member of research team; published qualitative research
<i>Relationship with Participants</i>			
6.	Relationship established	Was a relationship established prior to study commencement?	There was no pre-existing relationship with the interviewers and participants.
7.	Participant knowledge of the interviewer	What did the participants know about the researcher?	Participants were briefed on the purpose of the study. Participants also reviewed the study information sheet before they provided verbally

			documented informed consent to proceed with the interview.
8.	Interviewer characteristics	What characteristics were reported about the interviewer?	KB and NY are both practicing pharmacists with an interest in approaches to management of menopause symptoms and improving the health of midlife women. MQ is an expert in qualitative methods with a background in healthcare

## Domain 2: Study Design

### *Theoretical Framework*

9.	Methodological orientation	What methodological orientation was stated to underpin the study?	Qualitative description using content analysis as part of the second phase of a larger, mixed methods study using explanatory sequential design. First phase of study entailed a cross-sectional, quantitative survey.
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### *Participant Selection*

10.	Sampling	How were participants selected?	Survey results from the first phase of the mixed methods study guided purposive sampling for the second qualitative phase.
11.	Method of approach	How were participants approached?	Survey participants who agreed to follow-up were contacted by email.
12.	Sample size	How many participants were in the study?	12
13.	Non-participation	How many people refused to participate or dropped out? Reasons?	28 women were contacted by email. <ul style="list-style-type: none"> <li>- 1 declined invitation to interview participation</li> <li>- 2 agreed to participate but failed to confirm interview time</li> <li>- 13 did not respond to email invite</li> </ul>

### *Setting*

14.	Setting of data collection	Where was the data collected?	Data was collected remotely by phone or through video teleconferencing software (e.g., Zoom)
15.	Presence of non-participants	Was anyone else present besides the participants and researchers?	No
16.	Description of sample	What are the important characteristics of the sample?	Interview participants were women located in Alberta, between the ages of 45 and 63, who categorized as either in perimenopause or post-menopause off self-reported changes

to their menstrual cycle and presence of menopause symptoms. All 12 women were current cannabis users.

*Data Collection*

17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Interviews were semi-structured using an interview guide (see Appendix F) developed/reviewed by the research team based on survey questions from the mixed methods study and guided by literature. The interview guide was not pilot tested but was updated in an iterative process throughout the data collection period.
18.	Repeat interviews	Were repeat interviews carried out?	No
19.	Audio/visual recording	Did the researcher use audio or visual recording to collect the data?	Interviews were audio-recorded and transcribed verbatim with Otter.ai, then manually checked for accuracy.
20.	Field notes	Were field notes made during and/or after the interviews?	Field notes were made during and after the interviews.
21.	Duration	What was the duration of the interviews?	The interviews ranged from 24 to 55 mins. (Approximate average of 42 mins.).
22.	Data saturation	Was data saturation discussed?	Yes – repetition of described experiences was discussed between KB, NY and MQ and used to signal data saturation
23.	Transcripts returned	Were transcripts returned to participants for comment or correction?	No

**Domain 3: Analysis and Findings**

*Data Analysis*

24.	Number of data coders	How many coders coded the data?	<b>KB</b> and <b>MQ</b> independently coded a transcript and discussed consistency of meaning units and codes through an inductive coding approach. <b>KB</b> then analyzed remaining transcripts independently with <b>MQ</b> and <b>NY</b> providing feedback on category development.
25.	Description of the coding tree	Did authors provide a description of the coding tree?	Yes – codes, categories and subcategories were shared with the research team and an example was included in the Appendix (See Appendix



26.	Derivation of themes	Were themes identified in advance or derived from the data?	Main categories/themes were derived from the data
27.	Software	What software, if applicable, was used to manage the data?	NVivo for Mac
28.	Participant checking	Did participants provide feedback on the findings?	No
<i>Reporting</i>			
29.	Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified?	Findings were supported with direct quotations from interview participants. Quotations were anonymized by interview number.
30.	Data and findings consistent	Was there consistency between the data presented and the findings?	Yes
31.	Clarity of major themes	Were major themes clearly presented in the findings?	Yes
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Sub-categories were developed to describe minor themes or highlight diversity of experiences

\*Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

**Appendix H. Sample Coding Tree for portion of “Initiation and Management of Cannabis”**

Meaning Unit	Code	Category	Theme	Domain
“...for the last several years I would say I've been taking it more for like medicinal use rather than recreational. And then for the menopausal symptoms I've found it helps with libido hugely. And, and that nausea, like I said, from the migraines and I would say, yeah, for relaxation as well. So it is it does help my mood in terms of being grumpy.” (P10)	Managing symptoms	Self-management “Taking matters into own hands”	Initiation and Management of Cannabis	Women’s cannabis experience
“And generally, like, if you feel like you're too high or you, you eat something or you go to sleep. And that usually takes care of it.” (P1)	Managing side effects			
“I know what dose I'm taking and I can control that” (P2)	Sense of control			
“...my husband's always been adamant he goes, your medication [cannabis] has to come first like that we can give up other things.” (P5)	Spouse support	Level of support	Initiation and Management of Cannabis	Women’s cannabis experience
“he [son] is going into school to be to go work at one of those look at marijuana companies. So he's going in to, you know, growing and stuff like that. So, he's always doing research. And so he will say to me, you know, what, Mom, I read up on this particular plant, you know, here's the comments that they said, like, you know, maybe you should try this one and then so then that's where we would go” (P11)	Family Advice			
“...you've managed using cannabis for medical purposes pretty much on your own in this case?  P3:Oh, yeah. And with the help of friends, so this is what I do. And this is how I do it.” (P3)	Help from friends			
“I can just go down to my neighborhood shopping area, I just get them at the shops in my neighborhood.” (10)	Cannabis dispensary stores (public, non-medical)	Product Access	Initiation and Management of Cannabis	Women’s cannabis experience
“I'll go through the Shoppers cannabis” (P12)	Medically accessed			
“I'm still working off of black market stuff. So I usually just send my husband and he's not going to smoke it, but he'll go in. Okay, go ahead and buy it for me.” (P3)	Black market			
“...usually it's my son who does the ordering or the buying. And then he brings it to me. Because I just trust him” (P11)	From friends/family			

<p>“I tried edibles a couple times, but I find with the edible, it just makes me go to sleep. Which is okay, if I want it for sleep...but occasionally I'll like vape the flower.... Not from an oil but from the actual bud, [I] have a vape pen for that. I find I can't, at least I just cough too much if I try to smoke a joint or something like that.” (P6)</p>	<p>Try different products</p>	<p>Experimentation</p> <p>“Trial and error”</p>		
<p>“...it was trial and error, I think we both started just like, well, the CBD doesn't make you high or impaired in anywhere. So let's start at, you know, quarter of a dropper, okay, that's not really doing anything, let's start as half as good as half a dropper for a while, you know, and we just kind of built it.” (P7)</p>	<p>Right amount the works</p>			
<p>“Well, about three years ago, we bought a considerable amount... And there were different names on it. So, I was able to say, well this, you know, Gorilla Goo is truly, it's pretty good, but this Mystery Bag, and that's what it's called mystery bag was better. That's really, that's how I did it.” (P3)</p>	<p>Try different strains</p>			
<p>“And trial and error, I've kept a diary like from when I first started taking it every single day, I would write down exactly how much I took of each product, and how I felt, how I slept, when I woke up. And I probably did that three months, like every day, and then once it started to settle down, okay, this is working” (P5)</p>	<p>Documenting effects</p>			

## Appendix I. Figures of Emerging Themes and Categories from Women's Cannabis Experience

