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ORIGINAL RESEARCH ARTICLE

# The Information-Seeking Behavior and Unmet Knowledge Needs of Older Medicinal Cannabis Consumers in Canada: A Qualitative Descriptive Study

**Jeffrey I. Butler[1] · Sherry Dahlke[1] · Rashmi Devkota[1] · Shovana Shrestha[1] · Kathleen F. Hunter[1] · Madeline Toubiana[2] · Maya R. Kalogirou[3] · Joanna Law[1] · Melissa Scheuerman[1,4]**

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## Abstract

**Introduction** Older Canadians (age 60+) are increasingly using cannabis to treat their health problems, but little is known regarding how they learn about medicinal cannabis. This study explored the perspectives of older cannabis consumers, prospective consumers, healthcare professionals, and cannabis retailers on older adults' information-seeking behavior and unmet knowledge needs.

**Methods** A qualitative descriptive design was used. Semi-structured telephone interviews were conducted with a purposeful sample of 36 older cannabis consumers and prospective consumers, as well as 4 healthcare professionals and 5 cannabis retailers from across Canada, for a total sample of 45 participants. Data were thematically analyzed.

**Results** Three main themes characterizing older cannabis consumers' information-seeking were identified: (1) knowledge sources, (2) types of information sought, and (3) unmet knowledge needs. Participants accessed a variety of knowledge sources to inform themselves about medicinal cannabis. Cannabis retailers were identified as providing medical information to many older adults, despite regulations to the contrary. Cannabis-specialized healthcare professionals were also viewed as key knowledge sources, while primary care providers were perceived as both knowledge sources and gatekeepers limiting access to information. The types of information participants sought included the effects and potential benefits of medicinal cannabis, the side effects and risks involved, and guidance regarding suitable cannabis products. Participants' most salient unmet knowledge needs focused on dosing and use of cannabis to treat specific health conditions.

**Discussion** Findings suggest that barriers to learning about medical cannabis among older consumers identified in prior research remain pervasive and cut across jurisdictions. To address these barriers, there is a need for better knowledge products tailored to older cannabis consumers and their information needs, and further education for primary healthcare providers on medicinal cannabis and its therapeutic applications with older patients.

## 1 Background

Older adults (aged 60+) are the demographic group with the largest increase in cannabis consumption in both Canada and the USA in recent years [1–4], and older adults are more likely than younger adults to consume cannabis for health reasons [5–7]. Prior research on cannabis, however, has predominantly focused on younger people [8], and some studies have grouped older adults with people over the age of 50 [9, 10], even though responses to cannabis can vary greatly between 50-year-olds and those 60+ (e.g., likelihood of falls). It is only in recent years, as older adults' consumption of cannabis has increased dramatically, that their experiences with medicinal cannabis have received greater attention in the scholarly literature [11–21].

To consume cannabis safely and effectively, older adults require information about the therapeutic use of cannabidiol (CBD) and tetrahydrocannabinol (THC) as well as cannabis products and modes of delivery (e.g., oil, edibles, vaporization, topical creams). Yet older adults may not know how best to access related information or be reluctant to discuss cannabis with their healthcare providers [11, 15] due to the stigma associated with it. This reluctance may prevent older adults from receiving accurate information, thereby increasing the

✉ Jeffrey I. Butler
jibutler@ualberta.ca

✉ Sherry Dahlke
sherry.dahlke@ualberta.ca

Extended author information available on the last page of the article

**Key Points**

This exploratory study contributes to the growing literature on medicinal cannabis consumption among adults aged 60+ by elucidating their information-seeking behavior and unmet knowledge needs from the perspectives of both older consumers and information providers.

There is a need for better knowledge of products tailored to older cannabis consumers to meet their information needs and combat stigma that may lead them to avoid discussing cannabis with healthcare professionals.

Primary healthcare providers, particularly physicians, lack knowledge about medicinal cannabis and often "shut down" older persons' questions about it. We recommend that healthcare providers complete existing educational modules focused on medical cannabis and older adults, and that education on medicinal cannabis be integrated into continuing education credit programs for healthcare providers to incentivize their learning.

possibility of drug interactions with their other medications, as well as a heightened risk of harmful side effects or negative health consequences due to multiple comorbidities and age-related changes [8, 22]. Some recent prior research has examined information-seeking among older cannabis consumers [11, 15, 18]. However, very few studies have explored the topic in Canada. Baumbusch and Yip [20] reported on information seeking in this population, but as part of older Canadians' experiences with cannabis more broadly, and only from the perspective of older consumers. Given that medical cannabis access and consumption in Canada has changed due to the legalization of recreational cannabis in 2018 [21] and continues to evolve, there is a need for further research into older Canadian consumers' information-seeking behaviour and knowledge needs from the perspectives of both the older adults seeking information and those advising them.

### 1.1 Study Objectives

To build knowledge in this area, this study aimed to understand older consumers' experiences of accessing information about cannabis for medicinal reasons from the perspectives of both the older consumers receiving information and the advisors providing it. The research questions were:

a. How do older adults go about accessing information about medicinal cannabis and what information sources do they consult?
b. What type of information do they seek?
c. What are their most pressing unmet knowledge needs?

### 1.2 Medicinal Cannabis Use among Older Consumers

Cannabis has been used for millennia to treat conditions such as rheumatism, pain, sleep, inflammation, nausea, anxiety, sleep issues, and depression [7, 15, 19, 23–26]. Studies show that older consumers commonly seek out cannabis for health reasons such as managing pain [5, 15, 27–29], and that older adults' prior history with cannabis impacts their current perceptions of it as a treatment option [13]. Research on cannabis efficacy and safety in older adults, however, is scant. Some recent studies note that cannabis consumption for older populations is complicated by the amount of THC in a given product, which may lead to negative side effects such as falls, heart attacks, or psychotic episodes [8, 30]. Other research has shown promising outcomes related to reducing polypharmacy and reliance on medications with negative side effects, such as opioids or other narcotics [7, 15].

### 1.3 Information Seeking about Cannabis by Older Consumers

Some prior research has examined how older adults learn about cannabis and their views on their information needs. Baumbusch and Yip [20], for instance, reported that seeking information and guidance on cannabis use was highly salient in interviews broadly addressing older consumers' experiences with cannabis. In that study, the main sources of information participants consulted were friends and acquaintances, cannabis store employees, and the media. Manning and Bouchard [18] also used interviews to explore older adults' perceptions and experiences of medicinal cannabis consumption to manage chronic conditions in lieu of traditional pharmaceuticals. They found that older adults noted a lack of education regarding the use of cannabis products and viewed the branding and naming of cannabis products as confusing. Bobitt et al.'s [15] focus-group-based study found that participants emphasized the need for education about the use of cannabis, particularly the positive and negative effects of medical cannabis use, modes of consumption, and cannabis dosage. Most participants articulated a preference for discussing cannabis with their healthcare providers, but many encountered a lack of openness when they broached the topic their providers. Another study by Bobitt and colleagues [31] also foregrounded the importance of healthcare professionals as information providers to older persons regarding cannabis. To the best of our knowledge, however, few studies have examined the perspectives of both older consumers and information providers in tandem.

## 2 Method

### 2.1 Design

A qualitative descriptive design (QD) [32, 33] was used to elucidate the perspectives of older medicinal cannabis consumers or prospective consumers, as well as the views of cannabis professionals and retailers. QD aims to capture the key elements of social phenomena in the terms of the actors involved [33], and thus provides a useful approach to exploring poorly understood phenomena, such as the experiences of older Canadians accessing information about cannabis. Remote interviews were chosen to mitigate concerns about face-to-face participation during the COVID-19 pandemic and were conducted one-to-one to ensure that participants were comfortable discussing a potentially sensitive topic.

### 2.2 Sample

We purposefully sampled English-speaking older Canadians, cannabis health professionals, and cannabis retailers. Eligible older adult participants were aged 60+, resided in Canada, and had used or were considering using cannabis to manage a health problem. Eligible cannabis professionals and retailers were employed in a role that involved advising older cannabis consumers or prospective consumer on cannabis use. Interviews were conducted until informational saturation, the point at which no new codes or categories were emerging in the data was achieved [34], as determined conjointly by the research team. All participants provided verbal consent at the outset of the interview. No eligible participants dropped out after having provided consent.

### 2.3 Recruitment

The flyer advertisement for the study was circulated via email across Canada to settings where potential participants were likely to see it (e.g., newsletters for organizations for older adults). Potential participants self-selected to enroll by contacting the researchers via email or telephone and were then screened for eligibility by a research assistant (J.L., S.S., R.D.,) or the project manager (J.I.B.), who provided eligible participants with the study information letter and answered any questions. To facilitate recruitment, participants received a $30 honorarium.

### 2.4 Data Collection

Interviews were conducted by the study research assistants (J.L. was a recent MN graduate and S.S. and R.D. were current PhD nursing students) who had received training in 1:1 interviewing from the study's principal investigator (S.D.) and project manager (J.I.B.); both of whom have extensive qualitative research experience. All the research assistants and the principal investigator self-identified as women and the project manager as a man. No research team members had a prior relationship with participants. Participants were informed that the interviewers were motivated by an interest in improving healthcare delivery and outcomes for older adults and wanted to understand older Canadians' perspectives and experiences accessing information about medicinal cannabis.

The interviews followed a semi-structured interview guide with questions and accompanying probes (Table 1), were conducted remotely via telephone or Zoom audio, lasted between 18 min and 55 min, and were audio recorded and professionally transcribed verbatim. The interview guide was pilot tested with the first three cannabis consumers and first three professional/advisor participants; it was determined that no adjustments were required. No repeat interviews were conducted, but participants were invited to follow-up with the researchers if ideas came to mind after the interview.

#### 2.4.1 Data Analysis

For both older consumers and advisors, data analysis was conducted concurrently with data collection and involved a thematic analytic approach that was both deductive and inductive. First, an initial, deductive codebook was developed on the basis of our research objectives and interview guide. Next, we used an inductive approach to look for unanticipated codes, with the research assistants and project manager coding the first three transcripts. The remaining transcripts were coded, while also accounting for any new emergent codes. To ensure that we did not assert informational saturation prematurely, all data were given equal consideration, and negative cases were scrutinized. NVivo was used to support systematic coding across team members. Finally, codes were grouped together to form hierarchical categories and subcategories that were then refined into unifying themes [35, 36]. To help contextualize the thematic analysis, conceptually clustered matrices were used to map out participants' demographic characteristics (e.g., age when first consumed cannabis) and the key features of participants' narratives (e.g., types of information sought, sources consulted, etc.), which allowed for summative counting. To ensure participant confidentiality, pseudonyms were used that reflected participants' reported gender.

#### 2.4.2 Analytic Rigor

Strategies to ensure trustworthiness were implemented throughout the research process [37, 38]. Confirmability

**Table 1** Semi-structured interview guide

| Questions | Probes |
|---|---|
| How do you seek out information about cannabis? | a. What kind of information do you usually seek out?<br>b. How do you access it? |
| Who, if anyone, do you feel most comfortable consulting for information about cannabis? | c. Were there specific people you avoided talking with about cannabis?<br>d. If you had a consultation experience that went particularly good or bad, can you share that with us? |
| What questions did you have about cannabis when you first started using it versus now? | e. If so, what are they? |
| Do you still have unanswered questions about cannabis use? | f. If so, what are they? |

was ensured by maintaining an audit trail of coding decisions and researcher reflexivity. Credibility was achieved through remaining open to all potential themes, careful analysis of negative cases, and independent analysis of data by members of the research team. Reduction of the data and conclusion drawing were supported by detailed verification. When disagreements arose about coding decisions, the research team debated our interpretations until consensus was reached [38]. Dependability was assured through in-depth methodological description, and transferability through the inclusion of participants' demographic characteristics that put the study in context [39].

## 3 Findings

### 3.1 Participant Demographic Characteristics

The final study sample consisted of 45 participants: 36 cannabis consumers (31 active consumers, 3 prior consumers, and 2 prospective consumers) and 9 cannabis advisors. The median age of the older adult participants was 69.4 years (range 60–86 years). A total of 14 participants self-identified as men and 22 as women; 23 participants were based in Alberta, 4 in Manitoba, 4 in Nova Scotia, 2 in Ontario, 2 in British Columbia, and 1 in Quebec. In total, 27 lived in a city, 6 in a small town, and 3 were rural dwelling. The most common motivations for consuming cannabis for health reasons were managing pain, sleep problems, anxiety, and depression; 19 participants had first consumed cannabis as a youth, 6 as an adult, and 11 as an older adult. Eight participants were lifelong consumers, and a pattern was noted whereby 12 consumed as a youth or young adult recreationally, then not at all or rarely as adults or during middle age, then resumed consuming as older adults for medicinal purposes. A total of 19 consumer participants were daily cannabis consumers. For those who advised older adults about cannabis, the sample included one registered nurse, one physician, one pharmacist, one massage therapist, one cannabis advocate, and four cannabis retailers Table 2.

Thematic analysis identified three main themes aligned with our research questions: (1) knowledge sources, (2) types of information sought, and (3) unmet knowledge needs.

### 3.2 Knowledge Sources

Participants described accessing a variety of knowledge sources about medicinal cannabis (see Table 3). Below, each is discussed in turn.

#### 3.2.1 Online Sources

Many participants described relying heavily on internet sources for information about medicinal cannabis. Sage recalled how her first stop was "Mr. Google," where she bypassed what she felt were questionable websites to locate resources from "credible, medical, legitimate" sources such as the Mayo Clinic and the Memorial Sloan Kettering Cancer Center. Some, such as Aiden, highlighted online chat forums as a means of having specific questions answered by fellow older cannabis consumers, and that consequently "I talk to people on the internet a lot about cannabis." Still, as Dae conceded, online sources could be confusing because "I really didn't know what I was looking for, there's so much. I was just so overwhelmed."

Cannabis professionals such as Maria were wary of online sources. She noted that "a lot of seniors are getting duped online with the safe-looking online dispensaries that are not regulated…they all think it's real." Similarly concerned about misinformation, Lorna explained how she had:

> founded an online community to facilitate education and peer support for women specifically accessing cannabis for medical purposes in Canada. We have about 11,000 members, lots of peer support, because we understand that people are often just so overwhelmed by the volume of information around cannabis.

**Table 2** Themes and categories

| Themes | Categories |
|---|---|
| Knowledge sources | Online sources |
| | Cannabis retailers |
| | Friends and family |
| | Medical cannabis producers/industry sources |
| | Cannabis-specialized healthcare professionals |
| | General physicians/healthcare providers |
| Types of information | Effects and medicinal benefits |
| | Side effects and risks |
| | Cannabis products |
| Unmet knowledge needs | Dosing |
| | Advanced knowledge and cannabis and specific health conditions |

**Table 3** Information sources cited by older medicinal cannabis consumers

| Information source* | Frequencies |
|---|---|
| Online sources | 29 |
| Healthcare professionals | 20 |
| Cannabis retailers | 12 |
| Family and friends | 11 |
| Medical cannabis producers | 7 |

*Frequencies do not total 36 because more than one source may apply

#### 3.2.2 Cannabis Retailers

Non-medicinal sellers were also described as important information sources. By law, government-regulated recreational sellers (e.g., BC Cannabis, Alberta Cannabis) are forbidden to provide medical guidance. As Apporva explained, "a retail employee absolutely cannot [dispense medical information]—the store runs the risk of losing its license." Nonetheless, 12 consumer participants—one-third of our sample—reported that they had been provided medical guidance by retail staff. Emory, a self-described cannabis "budtender," was candid that he routinely dispensed medical advice:

> I do see quite a lot of seniors come in with questions I do my best to answer them with what I know from seven-plus years using cannabis as medicine in my own life and extensively studying the literature and extensively reading all the books I can get my hands on to further my knowledge.

Charis, a physician, was highly critical of retailers providing medical guidance and lamented that "I have people tell me, 'Well, they [retailers] told me to do this and they told me to do that' they literally do not know what they're supposed to be doing, the patients." She went on to explain that she was "uncomfortable when people go to stores" because staff were not knowledgeable about the potential hazards of drug interactions with cannabis or potential unintended effects on chronic conditions.

#### 3.2.3 Friends and Family

Numerous participants turned to friends and family members to meet their information needs. Aaron explained that:

> I rely a bit on my friends, some guys that I would consider experts. There's one guy I know that grows it for the government and he has all the certificates and licenses to do that. So friends are pretty important as they come up with some good valuable information.

Casey similarly related how "I was experiencing some pains and I have a friend of mine…he recommended, he said it helped him ease his pains as well." Cannabis professionals, however, were ambivalent about friends and family playing this role. Manu noted that family and friends could misinform product choices:

> well-meaning family members are out buying recreational cannabis for their parents and grandparents… that doesn't work in our favor, because the recreational cannabis is not as good as what you can get from the regulated [sources]…they could fall or start hallucinating or whatever.

#### 3.2.4 Medical Cannabis Licensed Producers

Medical Cannabis Licensed Producers—who have Medical Sales Licenses from Health Canada and are permitted to sell directly to registered medical cannabis patients—were also described as sources of knowledge. Kennedy recounted reaching out to a medical producer and "had probably twenty questions, I had a whole list of them—and they took time, like, two hours on the phone [to answer Kennedy's queries]." She outlined how "the place that I ordered the CBD from… is a medical distributor and I got to talk to two people there at length, who are very, very knowledgeable and explained things to me" and Aiden shared that "I phone the people that I get it from. I can phone them any time and ask for advice… and say, 'I've got a problem with this'...because they are medical professionals." Artemis similarly explained that "the company from which I buy the medical marijuana provides

all the information I need and I know that it's valid, because it's from a trusted source."

#### 3.2.5 Cannabis-Specialized Healthcare Professionals

Participants also cited healthcare professionals at specialized medical cannabis clinics as informational. Jo stressed that clinic nurses were "very knowledgeable and helpful" and Parker explained how:

> I have one particular [nurse] educator that I work with, so if a question comes up, I can send her an email and she usually replies the same day or the next day…but I've spoken to her too and she seems very helpful and she listens carefully, so I feel a lot of comfort and trust in using them.

Terry's clinic nurse "always answers any questions that I've got…I have a phone consultation every three months with the Medical Clinic…that's a place where I can always ask more questions."

Cannabis clinic physicians were also lauded as informative. As Tandy noted, clinic physicians had "so much expertise…[because] that's all they do, is they deal with cannabis" and Parker described how her physician was "incredibly knowledgeable…he looked at my records and he put together things and explained things in a way that no other doctor had." She went on to explain:

> every once in a while I have a call with the doctor, and so then we'll go over…I check in with the doctor every, maybe it's every six months, in between that you're just with the [nurse] educator. So, that's where I get my information, it's through them.

Manu, offering the perspective of a cannabis-specialized physician, explained how "I've got a lot of the nursing homes calling me and wanting me to come and do presentations and whatnot about medical cannabis. And the rooms are always full. Charis similarly explained that "there's a lot of education that I do for patients…because there's so much misinformation…you just have to work through it."

#### 3.2.6 General Healthcare Professionals

In contrast to cannabis-specialized healthcare providers, primary care providers, especially physicians, were seen as as both key sources of knowledge and gatekeepers limiting access to information. Parker, for example, asserted that her family physician "is knowledgeable about cannabis" and two other participants similarly indicated that they had received helpful guidance from their family physicians. A striking number of participants, however, expressed frustration at their physician's reluctance to engage with them about cannabis and how it might contribute to treating their health condition(s). Many felt that physicians were dismissive of cannabis-related questions because they were unknowledgeable. Jay noted with disappointment that:

> my family doctor, he wouldn't even know what to prescribe you or how much…I've talked to a few doctors but they're not very well informed…My family doctor, he's not very up to speed…so they don't give very much valuable information.

Shiloh, too, asserted that "[physician] knowledge of cannabis [is] very lacking…they do not know about cannabis and how to prescribe them and what education to deliver to the public…there's a great lack of knowledge there."

Other participants asserted that their physician did not view cannabis as a legitimate treatment method and had discouraged them from exploring its medicinal use. Quinn recalled that his physician openly disapproved and "wasn't really in favor of me using it." Participants such as Jay recounted that his physician contended that there was insufficient evidence on the potential benefits of cannabis to support its use. More commonly, though, participants encountered a blanket rejection of medicinal cannabis, as captured in the following quote from Skyler:

> And they were just sort of like, "no, no you shouldn't do that." So there really wasn't much discussion… And then when I got a prescription, you could get a prescription before it was legal [for recreational use]. Even then when I talked to my doctor about getting a prescription from someone else, he wasn't happy about that.

Manu, the physician, agreed that:

> most of the stigma is held by their family physicians. So they're interested [older adults], their family physicians aren't helping them out, they don't know where to turn…when they asked their family physicians about it, they were shut down.

### 3.3 Types of Knowledge Sought

Participants sought diverse forms knowledge about medicinal cannabis (see Table 4).

#### 3.3.1 Effects and Medicinal Benefits

Participants, particularly those without prior experience with cannabis, had a host of questions about "the medicinal benefits" (Shaun), and the potential "positive effects" (Jay). First-time consumers such as Artemis wondered "whether it would be effective or not…What other people experience… what are the results from other people using it?" Harper

noted: "I'm interested in how it can kind of improve my overall health and well-being…in the health and wellness benefits especially as I am becoming a senior."

#### 3.3.2 Side Effects and Risks

New and experienced consumers alike were concerned about the potential risks involved. Casey was candid that "I wanted to know what I was getting into" and Artemis confessed that she was worried about "the side effects… negative effects…any long-term side effects." She elaborated that she was "deeply afraid of the addiction, if there was any addiction" and was relieved when she concluded that "those fears were unfounded." Harper explained that "when I first started using it [medicinal cannabis] I guess my biggest question was whether it was bad for me…my first concern was the impact to my lungs." Kennedy echoed many participants when she wondered if cannabis "is compatible with other medications? Because I am taking other medications, I wanted to know there wasn't any contraindications." Nico similarly recalled having "done some research about the effects of marijuana that could possibly have with prescribed medications that I'm taking, like, for instance, for cholesterol or for high blood pressure." When asked what types of information older people typically seek about their cannabis use, Charis, the physician, responded "mainly how safe is it, is it going to interact with the medications they're on, how likely is it to work, and how can they reduce the medications they're on that they really don't like."

#### 3.3.3 Cannabis Products

Finally, numerous participants described seeking information about cannabis products and which ones fit best with their treatment needs. Jay, for instance, found it difficult to make sense of the "different products and delivery methods" she had seen online, including dry herb (smoked or vaporized), edibles, topical creams, oral sprays, oil tinctures, and capsules. Participants such as Brady explained that they were unsure "which product is best for you. Is it the CBD oil? Is it the gels? Is it ingesting it in food?" Emory, a retailer, recounted how older adult's questions invariably centered on "the products. It's like, 'Which of these? I need help sleeping, which of these would be the best thing to try for sleep?'" Maria, the pharmacist, recalled that "it's mostly non-combustible formats, so your oil capsules, rapid dissolves…we help them find formats, schedule of using combusting inhalation products, vaporization, down to oils and capsules and longer-acting formats." Many consumers indicated that they were averse to smoking, and that they gravitated toward oil extracts that could be taken sublingually or ingested. Many participants, including Nico, had sought to understand the "different strains...there's indica, and sativa, then there's a hybrid" as well as "all the terminology around terpenes," which impact the flavor, effects, and medicinal properties of cannabis products. Above all, participants were eager to know the differences between CBD and THC because THC, which is associated more with recreational consumption, may have mind-altering effects.

**Table 4** Types of information sought by older medicinal cannabis consumers

| Topic* | Frequency |
|---|---|
| Side effects and risks of cannabis | 29 |
| Effects and medicinal benefits of cannabis | 14 |
| Cannabis products (THC versus CBD, different strains) | 13 |

*Frequencies do not total 36 because more than one type may apply

### 3.4 Unmet Knowledge Needs

When it came to unmet information needs, participants generally fell into three categories. First, more than half of our sample (19/36) considered themselves to have sufficient knowledge and reported that they had no unanswered questions. Second, another set of participants (13/36), which included prospective consumers, indicated that they had unanswered questions about basic information related to medicinal cannabis. Third, a small group (4/36), indicated that they had sufficient basic knowledge but were interested in acquiring a higher-level understanding of medicinal cannabis. Below, participants' unaddressed knowledge needs, focused on dosing and treatment of specific health conditions, are described (Table 5).

#### 3.4.1 Dosing

Participants highlighted the need for more information about dosing. Like many older consumers, Shaun recounted being confused about the correct "quantities, the recommended dosages." Many were astonished that, compared with over-the-counter medications such as acetaminophen or ibuprofen, which come with a lengthy list of recommendations for use and contraindications, cannabis products come with almost no guidance on how to consume them safely. Sage noted with frustration that when it came to the amount of a given product to take, "I'm on my own…I am completely on my own. And I'm experimenting and sometimes with some side effects that I find really uncomfortable." Like many other participants, Sage had received little direction beyond "go low and slow," referring to gradual titration to identify the correct dose. Participants were similarly lost regarding how different forms of delivery impacted dosing. Kerry explained that he did not fully understand "how much you should take. When I went to see a doctor he was prescribing

a certain amount. So I'm curious how that works out when you just vaping or eating it...how they compare." He noted that physicians advised taking only:

> a little bit but you don't know, they're [different forms of cannabis] all different. I still don't know what strength I'm using. Like if they say take 10 milligrams or micrograms or whatever, 'well use this much on the little syringe that you put under your tongue', but you don't know what strength they are. If you're using half a syringe you don't know exactly how much you're getting.

Finley agreed that "I'm never sure what's the appropriate amount" and Jay was bewildered in terms of navigating "the strengths…the different potency levels." As a result, many participants, such as Kerry, were unclear about whether it "was something that we take on a daily basis?...[what] is too much too much? Is just a little bit enough?"

Sage pointed to a dearth of learning resources for older cannabis consumers about dosing. He explained that despite his best efforts to inform himself "it's all too much information and not enough that answers my questions. It's just so scattered that really at the end of the day, you're more confused." As a result, older consumers often have no choice but to improvise, as demonstrated by the following comments from Jay:

> when I first started using the CBD oil I had to figure it out for myself what was the best [dose] for me…experimentation is the only way really…I sort of adjusted what I take, was sort of self-taught.

Cannabis professionals and educators also flagged dosing as a crucial area where older people required more guidance. When asked what information older adults sought most about cannabis, Maria, the pharmacist, replied: "Dosing…is this going to help me with my chronic condition, can I take this with my other medications, what's the dose I should be taking?" Lorna, the medical cannabis advocate and online community founder, explained that:

> there's a lot of frustration and bewilderment around dosing of products because there's very little information out there…unlike a prescription medication which most older Canadians are very familiar with…That is very intimidating. So on a bottle of cannabis oil for instance you'll have often milligrams per milliliter of a product but then people are being kind of like, "how much do I take, do I take a milliliter, how many milligrams do I take?" So I find the trial and error piece of medical cannabis to be very bewildering.

**Table 5** Older medicinal cannabis consumers' unmet knowledge needs

| Unmet information needs* | Frequencies |
|---|---|
| None | 19 |
| Dosing | 16 |
| Cannabis and specific health conditions | 9 |

*Frequencies do not total 36 because more than one knowledge need may apply

#### 3.4.2 Cannabis for Specific Health Conditions

Numerous participants were eager to cultivate a more advanced, academic understanding of cannabis. Harper criticized what he perceived as the dearth of research focused on cannabis. He noted that:

> there's so little information and I'm hopeful that now that people like you and others are now actually able to study it are going to help us understand how it affects the body…and what strains are going to be most useful for the ailments…The information I get is largely anecdotal or very targeted to a specific study that's full of caveats.

Others wanted to learn how cannabis could be used to treat their specific health conditions. Sage, for example, noted that "my area of interest is on bone health…I like to know, is the information that I'm reading, is it factual information, has been researched and documented that yes, CBD can actually help with bone density?" Alternatively, Shaun was interested in learning more about "CBD for neuropathy, which is a big problem for people, I guess a lot of diabetics get that problem and I imagine a lot of people who have chemo get that problem, somebody who knew something about that in each store or some central information place."

## 4 Discussion

This study adds to the literature on medicinal cannabis consumption among older adults and is part of a growing number of studies examining information seeking in this population [11, 15, 20]. However, this field of research remains relatively limited, particularly in Canada [20]. The Canadian focus of our study expands what is already known regarding information seeking in this sociocultural and legal landscape, which may differ from other jurisdictions. Our key findings—that older cannabis consumers draw on a range of knowledge sources (some of which may lack credibility), most commonly seek information on cannabis products and their medicinal benefits, side effects, and risks, and that older consumers' most urgent knowledge needs are dosing and how cannabis might figure in the treatment of

specific health conditions—both echo and extend those of the few related studies that have been conducted [11, 18, 20].

In terms of knowledge sources, our findings build on those of a previous study conducted by Baumbusch and Yip [20], who found that online searches were a main source of information they received, and that some participants commented on the challenges of parsing an enormous amount of information about cannabis. The voluminous information about cannabis available online may be confusing to older consumers and contribute to misinformation. Finding information online may have allowed participants to sidestep any stigma they feared encountering from their healthcare providers but may have led them to consult inaccurate sources. We thus suggest that the information sources participants chose to rely on may have been shaped by a "judgement lens" that prioritized avoiding judgment, awkwardness, or stigma. Participants had many questions, but because they used this lens to determine where they sourced information, those questions may have gone unresolved or, more concerningly, older consumers may unknowingly have accepted misinformation as accurate.

Our finding that many older adults relied on cannabis retailers for medical guidance, despite this being explicitly illegal, also extend Baumbusch and Yip's [20] findings and is cause for concern. Retail staff are not qualified health professionals, and their dispensing medical advice leaves older adults vulnerable to miscommunications and misinformation. However, these retail staff may be more willing and accessible to answer older persons' questions than their primary healthcare providers and cannabis-specialized clinics, or older persons may be misunderstanding the role and qualifications of retail staff. For instance, participants mistakenly believed that cannabis purchased from a retail store was medical [20]. More research is needed to understand older persons' perceptions of the role of cannabis retailers in providing information as well as their experiences accessing specialty clinics and any barriers they encountered to doing so. Given that stigma surrounding cannabis continues to impact consumers' experiences and perceptions, it may be that the anonymity and convenience of visiting a retailer is perceived as preferable to contacting healthcare providers who they perceive may be judgmental. Indeed, both cannabis consumers and professionals/advisors made clear that primary care physicians were either unwilling or unable to provide older adults with the information they sought.

Our finding that primary healthcare providers, likely the most accessible healthcare professional for many, often lack knowledge about cannabis and refuse to engage with older adults seeking advice, builds on previous research on older cannabis consumers and healthcare providers. Research on the attitudes of healthcare providers toward medical cannabis concluded that they had positive attitudes toward medical cannabis purposes but are wary of a dearth of rigorous evidence on its impact on older adults [11, 40–42]. Chandiok, for example, found that practitioners in Australia were generally supportive of or open to medical cannabis use, but cited concerns such as dosing as barriers to prescribing. Similarly, Yang et al. [11] found that healthcare providers were reluctant to rely on a limited evidence base, had safety concerns such as impaired driving, and were worried about inconsistent product quality. Bobitt et al. [41] examined how participants' medical needs, demographic background, and attitudes influenced choices concerning the use of opioids and cannabis to treat pain and found that when respondents' physicians were willing to talk about cannabis with their patient, the chances of them choosing cannabis or cannabis in conjunction with opioids—rather than opioids exclusively—increased dramatically compared with when their health provider did not talk about cannabis use. Baumbusch and Yip's [20] Canadian study reported that most participants consulted their family physicians before consuming medical cannabis, but most found that their family physician was either unknowledgeable or unreceptive. Notably, none of older consumers in their sample were provided with a prescription or dosage recommendations by their family physician.

It is unfortunate that there is such a strong stigma among family physicians, because they are the group that could likely provide the best guidance for patients seeking medical cannabis information (since they are aware of the patient's entire medical history). Given that cannabis is becoming somewhat less stigmatized and older adults' interest in it is increasing, it is imperative that they feel comfortable seeking advice from healthcare providers and disclosing their use of cannabis (or interest in using it). Our findings suggest that many primary care providers may hold inaccurate or stigmatizing views of medicinal cannabis consumption. We therefore recommend that practicing primary care providers increase their knowledge, and that evidence-based resources for providers be available, such as Canadian Coalition for Seniors' Mental Health resources on Cannabis [43], which are easy to use and focus specifically on older people.

Furthermore, continuing education credits for healthcare providers are available, such as the "Canadian Cannabis Syllabus," an accredited program developed by The Canadian Consortium for the Investigation of Cannabinoids [44]. Other healthcare professions have already recognized the importance of cannabis education, e.g., it is mandatory for members Ontario College of Pharmacists [45]. We recommend that this requirement also be integrated into physician continuing education requirements. More broadly, we stress the need for a culture change and de-stigmatization, whereby healthcare providers acknowledge that older clients are using cannabis and that as healthcare professionals they can either help older adults use cannabis safely or alienate them further, ultimately forcing older adults to seek health

information from inappropriate or unqualified sources. Healthcare providers have a responsibility to provide accurate information on medical cannabis to their patients, just as they would for other drugs, rather than simply "shutting down" patients' questions about medical cannabis.

Our findings regarding the knowledge older cannabis consumers seek illustrates that evidence-based resources presented in easily accessible lay terms are needed to optimize older adults' learning about cannabis. When it comes to unmet knowledge needs, participants emphatically stressed challenges tied to dosing, which has been highlighted in previous studies as a key stumbling block for older consumers [15]. Manning and Bouchard's [18] study of the treatment-seeking behaviors of older consumers highlighted that the patient–physician relationship was a crucial influence on participants' decision-making. Participants reported frustration with the trial-and-error dosing process and feeling confused and overwhelmed regarding appropriate products. Baumbusch and Yip [20] likewise described how, due to a lack of guidance, participants often used trial and error to determine the appropriate dose. Accordingly, our finding underscores that difficulties tied to dosing persist and should be addressed.

While it is understandable that dosing for cannabis products is very individualized (and that, in addition to there being no standardized doses, the same dose of a cannabis oil from two producers could have significantly different effects, due to differences in product formulation), older consumers require a more standardized process and concrete direction or guidelines in line with the other pharmaceuticals they are familiar with. The self-supervised approach to titration, even with CBD products that are not psychoactive, can be confusing and invites human error. Participants who had their titration process overseen by a cannabis expert typically described their experience as positive, and there is a need to extend the practices employed by clinics to guiding resources for consumers outside of cannabis clinics. As Wolf et al. [46] note, cannabis products intended for recreational use purchased through retail stores or the black market may lack clear labeling and instructions [46]. More informative labeling that conveys decipherable amounts—akin to alcohol products indicating how much constitutes a standard drink—may be beneficial.

### 4.1 Limitations

Our sample was mainly drawn from Alberta and the findings may thus not be transferable to other provinces or jurisdictions. Additionally, older medicinal cannabis consumers and those advising them are a diverse population and the views articulated by our participants may not reflect the views of all consumers and advisors. In addition, the size of our cannabis advisor sample was lower than we had targeted. Given that primary care physicians figured prominently in consumers' narratives, it is unfortunate that we were unsuccessful in recruiting healthcare providers, especially primary care physicians; we had only one physician in our sample, and they did not work in primary care. Interviews with primary care physicians may have provided important insight into consumer–provider interactions from the physician point of view.

### 4.2 Implications for future research

Future research should explore the perspectives of retailers and primary care providers on their interactions with older patients related to medical cannabis. More scholarly attention should also be directed to rural/urban differences in accessing specialty cannabis professionals as well as the role communications technology may play in facilitating older adults' access to information about cannabis. Many specialized medical cannabis clinics conduct appointments virtually through a video call or phone call (especially in the context of COVID) but it is unclear how effective remote consultations may be and how they can be optimized. Additionally, future work should explore strategies and health policy initiatives to address stigma surrounding cannabis among healthcare professionals.

## Declarations

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**Ethics approval and consent (participation and publication)** Ethics approval was obtained from the Research Ethics Office at the University of Alberta, Certificate#: Pro00112287. Verbal informed consent was obtained from all participants. All methods were carried out in accordance with the relevant guidelines and regulations of the World Health Organization's Declaration of Helsinki.

**Author contributions** All authors contributed to the study conception and design. Data collection was performed by JIB, SS, RD, and JL and analysis by JIB and SD. The first draft of the manuscript was written by JIB and SD, and RD, SS, KFH, MT, MRK, JL, and MS commented on previous versions of the manuscript. All authors read and approved the final manuscript.

**Data availability** The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

**Code availability** Not applicable.

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## Authors and Affiliations

**Jeffrey I. Butler[1] · Sherry Dahlke[1] · Rashmi Devkota[1] · Shovana Shrestha[1] · Kathleen F. Hunter[1] · Madeline Toubiana[2] · Maya R. Kalogirou[3] · Joanna Law[1] · Melissa Scheuerman[1,4]**

Rashmi Devkota
rdevkota@ualberta.ca

Shovana Shrestha
shovana@ualberta.ca

Kathleen F. Hunter
kathleen.hunter@ualberta.ca

Madeline Toubiana
toubiana@telfer.uOttawa.ca

Maya R. Kalogirou
reshefm@macewan.ca

Joanna Law
jrl@ualberta.ca

Melissa Scheuerman
melissa@avantbrands.ca

[1] Faculty of Nursing, University of Alberta, Edmonton Clinic Health Academy, 11405-87 Ave NW, Edmonton, AB T6G 1C9, Canada

[2] Telfer School of Management, University of Ottawa, 55 Laurier Avenue East, Ottawa, ON K1N 6N5, Canada

[3] Faculty of Nursing, MacEwan University, 11405-87th Avenue, Edmonton, AB T6G 1C9, Canada

[4] Medical Cannabis Manager, Avant Brands Inc., 335-1632 Dickson Avenue, Kelowna, BC V1Y 7T2, Canada