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ORIGINAL RESEARCH ARTICLE

# Qualitative Analysis of Cannabis Use Among Older Adults in Colorado

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## Abstract

**Background** Although the rate of cannabis use by older adults is increasing more quickly than all other age groups, little is known about the reasons why older adults use cannabis and the outcomes they experience.

**Objective** The objective of this study was to identify the most salient themes concerning the use of medical and recreational cannabis by older adults living in Colorado. Specifically, we sought to (1) characterize perceptions of cannabis use by users and non-users, (2) determine how older adults access cannabis, and (3) explicate both positive and negative outcomes associated with cannabis use.

**Methods** Between June and November 2017, we conducted 17 focus groups in senior centers, health clinics, and cannabis dispensaries in 15 Colorado cities. Participants included 136 persons aged over 60 years who were both users and non-users of cannabis. We coded and analyzed session transcripts using thematic analysis with NVivo software.

**Results** We identified 16 codes from which five main themes emerged. These themes included: a lack of education and research about cannabis, a lack of provider communication, access to medical cannabis, the outcomes of cannabis use, and a reluctance to discuss cannabis use.

**Conclusions** Older adults want more information about cannabis and desire to communicate with their healthcare providers. Older adults who used cannabis for medical purposes reported positive outcomes but highlighted difficulties in accessing medical cannabis. Older adults in Colorado also revealed how a stigma continues to be attached to using cannabis.


**Key Points**

Persons aged 60 years and older in Colorado report positive outcomes with cannabis use for pain management.

Older cannabis users experience difficulties in accessing medical cannabis.

Older adults prefer to discuss cannabis use with their medical provider.

## 1 Introduction

Cannabis use among persons aged over 50 years has exceeded projections and outpaced the growth observed across other age groups [1]. From 2006 to 2013, the rate of past-year marijuana use among persons aged 50 years or older increased by 71.4% [2]. Data from the National Survey of Drug Use and Health showed past-year cannabis use climbed from nearly 3% in 2003 to just over 9% by 2014 in

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adults aged 50–64 years and from 0.2 to 2.1%, a ten-fold increase, in adults aged over 65 years [3]. While the number of older adults who use cannabis has been increasing, their cannabis use varies widely. Approximately half of all older adults who use cannabis are infrequent users, taking cannabis once a month or less [4]. Consistent lifetime users make up the other half of older adults who use cannabis, and nearly a quarter of these lifetime users take cannabis at least three to four times per week. While older persons who currently take cannabis are statistically more likely to have started using cannabis before the age of 30 years, 5.0% of older persons who used cannabis in the past year did not start until after age 30 years, and another 1.2% of older adults used cannabis for the first time after age 60 years [4, 5]. These data provide an initial picture of cannabis use by older adults but leave us looking for the reasons why older adults use cannabis and the outcomes for when they do.

### 1.1 Background

In reviewing previous work, we identified critical knowledge gaps and developed a framework to address them. Researchers have reported that older adults who use cannabis can experience negative outcomes, such as substance abuse and increased myocardial infarction, particularly among those with coronary artery and cerebrovascular disease [4–6]. Persons aged over 50 years who use cannabis are also more likely to smoke cigarettes, drink alcohol, and use illicit drugs such as cocaine and opioids [7].

However, more than nine out of ten of all older persons who used cannabis in the past year reported having no emotional or functional problems, and the majority indicated they placed no self-limit on their use [8]. Thus, while there is reason to be concerned that increasing cannabis use among older persons may contribute to undesirable outcomes such as increased rates of substance misuse, emergency room visits, and traffic accidents, the overwhelming majority of older adults do not experience such negative outcomes [7]. In fact, an increasing number of reports have highlighted the benefits older persons derive from taking cannabis for medical purposes [9, 10]. At this point, researchers should also consider the range of outcomes that might be experienced by persons aged over 60 years such as pain management, nausea relief, and reduced anxiety.

Most recently, the National Academies of Sciences, Engineering, and Medicine [9] recognized legalized cannabis as an option for older adults that provides some therapeutic value in treating diagnosable disorders and chronic conditions such as multiple sclerosis, chronic pain, and chemotherapy-induced nausea in patients with cancer [9]. While 68% of older adults currently experience two or more chronic conditions that place them at an increased risk for disability, loss of independence, and reduced quality of life [11, 12], the potential benefits older adults may derive from cannabis must be considered relative to the risks. Additionally, evidence has linked cannabis use with a reduction in opioid use and opioid-related deaths [13, 14]. Considering the increasing rates of opioid abuse in older adults [15], the association between cannabis and opioid use warrants further investigation.

At this point, researchers should consider the variety of motives that may shape the use of cannabis among persons aged over 60 years. We seek to better understand the proximal and distal factors shaping cannabis use. These include age-related conditions, individual attitudes to cannabis legalization and public opinion polls, and peer influence.

### 1.2 Is Aging a Special Population?

Our approach is guided by a paradigm in which the age period and cohort effects shape individual outcomes. If using cannabis is the outcome of interest, then we assume this outcome is shaped or influenced by unique *age effects* (e.g., older adults may be more likely to use cannabis for age-related healthcare needs such as symptom management); *period effects* (e.g., older persons may respond to changing contextual conditions and become more likely to use cannabis recreationally relative to the reduction in associated legal risks and increasingly positive social cues); and *cohort* (e.g., increasing use of cannabis by older adults could be attributed to a historically more tolerant baby boom generation [16]).

Over an individual's life course, these individual factors intersect and uniquely shape individual experience. For example, with age, persons increasingly experience symptoms of pain association with arthritis and other medical conditions and may use cannabis for symptom management and other 'medical' purposes [8, 17]. However, using cannabis to treat these symptoms has been defined as an illegal activity and many persons currently over the age of 75 years have little, if any, other types of knowledge about cannabis. Since California passed the medical cannabis initiative in 1996, USA has entered a period in which state governments have operated policy-making laboratories that have created a variety of approaches to legalizing cannabis (period effect). Older persons have responded to these changing legal environments and some are now more comfortable with taking cannabis recreationally [8, 18]. Meanwhile, the baby boom population continues to grow older and the number of Americans aged over 60 years who hold a favorable attitude toward cannabis has surpassed 60% [19]. In other words, as the baby boom generation grows older, cannabis use may be shaped by an increasing number of positive social cues and peer influences, and these may interact uniquely with age and period effects. Indeed, previous studies have identified social stigma as a critical influence on cannabis use [20, 21].

Yet, we suspect that in states with legalized medical cannabis, older adults who experience diseases and symptoms considered amenable to cannabis may be less concerned with social stigma, and may have unique perspectives about the intersection between medical cannabis and healthcare providers.

We know of few research studies that have empirically surveyed the range of attitudes, experiences, and outcomes concerning the use of cannabis among older adults in the context of legal access to both medical and recreational cannabis. As such, we see an *urgent need to illuminate critical issues* such as *How do older adult users and non-users view medical cannabis use? Do these perspectives differ regarding recreational use? How do older adults go about accessing cannabis? What outcomes do older cannabis users experience?*

### 1.3 Case in Colorado

In 2012, the state of Colorado expanded their cannabis program, becoming one of the first two states in USA to extend access to recreational cannabis in addition to medical cannabis [22]. Since that time, nine other states have expanded state cannabis programs to include recreational cannabis [22]. Having access to both medical and recreational cannabis provides a choice that many other states do not present, and working in Colorado allows us to explore a potentially interesting period effect as we examine what influences older adults' perceptions and experiences at the intersection between medical and recreational cannabis. In 2014, the Colorado Behavioral Health Risk Factors Surveillance System survey estimated cannabis use among persons aged over 61 years was less than 5% and much lower compared with younger individuals in Colorado but offered no further insights about the frequency, methods, or outcomes of using cannabis for medical or recreational reasons [23].

With data acquired from the Colorado Department of Public Health and Environment [23, 24], Kaskie et al. [16] reported that, between 2014 and 2015, the number of individuals in Colorado over the age of 61 years who registered to use medical cannabis increased from 15,495 to 18,100, and these older adults constituted 15.9% of all program participants. They also found the primary diagnosable conditions for which older individuals in Colorado reported using cannabis were: cancer (10.8%), nausea (5.7%), glaucoma (3.6%), and cachexia (1.6%), and the number of medical cannabis program registrants who reported having one of these diagnosable conditions was consistently higher among those aged over 61 years compared with younger population groups. The registry data also indicated that 89.7% of program registrants aged over 61 years listed pain as a primary or secondary symptom, and the proportion of older persons who identified pain management as a primary reason for medical cannabis use was considerably higher than younger populations. The registry did not provide information about the frequency, methods, or outcomes of using cannabis for medical reasons.

The increase in cannabis use among older individuals in Colorado is expected to continue for the next several years. In 2017, the number of Colorado residents over the age of 65 years totaled 773,787, representing 13.8% of the state population [25]. By 2030, the number of individuals residing in Colorado aged over 65 years will be 125% larger than it was in 2010, growing to an estimated 1,226,000 [26]. Like most Colorado residents, the current cohort of older individuals in Colorado hold a more favorable attitude toward the use of cannabis than persons nationally [27] and such favorable attitudes have been associated with increased medical and recreational use among those aged over 65 years [8]. Other researchers have found higher rates of cannabis use among those living in states with medical cannabis laws, and these differences persisted across all age groups [28]. The state of Colorado certainly offers an excellent opportunity to explore older adults' attitudes toward cannabis.

### 1.4 Research Goals

While researchers have begun to illuminate the pathways leading to illicit cannabis use among older adults, less attention has been directed toward the range of attitudes, experiences, and outcomes pertaining to the legal use of cannabis for either medical or recreational purposes. At this point, we believe a qualitative study in Colorado, where both medical and recreational cannabis use is legal, can provide a novel perspective and add to our understanding. The purpose of this study was to (1) characterize perceptions of cannabis use by both users and non-users, (2) determine how older adults access cannabis, and (3) explicate both positive and negative outcomes associated with cannabis use among older individuals living in Colorado.

## 2 Methods

Between June and November 2017, we conducted 17 focus groups in all regions of Colorado. The participants were 136 persons aged over 60 years (and one participant outside of the age range) who represented both users and non-users of medical and/or recreational cannabis. We made an effort to conduct focus groups within all 16 Area Agencies on Aging across the state of Colorado, and engaged local leadership in the Area Agencies on Aging, cannabis dispensary and retail shop owners, and other health officials in each region. Based on local community input, we identified a comfortable and accessible location to convene the group, and then distributed invitations to locations frequented by older adults. The

project was approved by the Institutional Review Boards at the University of Colorado at Colorado Springs and the University of Iowa, and all participants reviewed an informed-consent document before participating.

### 2.1 Sample

Overall, we conducted 17 focus groups consisting of four to five participants each, for a total of 137 participants. The age of the participants ranged from 46 to 93 years (only one participant was aged 46 years), with a mean age of 72.24 years (standard deviation = 6.47). Participation was fully anonymous to reduce fear of stigma. All participants completed a survey in which they reported basic demographic information (along with other questionnaires for which reports are published elsewhere) [29]. Due to the anonymity of participation in the focus group, we were unable to identify any particular individual among the participants. Table 1 provides demographic information for the participants. Group participants were a mixture of individuals who were: (1) enrolled in the medical cannabis program and using for medical purposes exclusively, (2) enrolled in the medical cannabis program and also using recreationally, (3) not enrolled in the medical cannabis program but reportedly using for medical purposes only, (4) using recreationally and for medical purposes but not enrolled in the medical cannabis program, (5) using recreationally only, or (6) non-users.

**Table 1** Focus group participant demographics

| Variable | Focus group attendees (*N* = 137) |
|---|---|
| Age, years (SD) | 72.24 (6.47) |
| Female, % | 66 |
| Ethnicity/race, % | |
| Caucasian | 94 |
| Hispanic | 8 |
| American Indian | 2 |
| African American | 1 |
| Education, % | |
| Less than eighth grade | 1 |
| High school graduate | 10 |
| Some college | 30 |
| College graduate | 28 |
| Graduate degree | 28 |
| Marital status, % | |
| Partnered | 57 |
| Divorced/separated | 17 |
| Widowed | 18 |
| Never married | 6 |

*SD* standard deviation

### 2.2 Procedures

Upon arrival at the focus group site, individuals completed a written survey (Lum et al., manuscript under review [29]) and then participated in an open-ended semi-structured group interview that lasted between 60 and 90 minutes. Members of our research team included two senior faculty members and two graduate students. All members had previously completed training in group interviewing for focus groups. Each focus group was conducted by at least one faculty member using a semi-structured interview containing 13 questions or topics. We asked questions such as *"Please share your thoughts about using medical cannabis"*, *"What do you think would be the best way to inform older adults about medical cannabis?*", *"What about being older makes using marijuana different compared to younger people?"*, and *"What do you think about the state cannabis program?"*. To ensure the integrity of the responses, we employed a form of member checking where they periodically restated answers to the interviewees to confirm that participant answers were captured correctly. This form of member checking is considered one strategy of researcher reflexivity and allowed interviewees to include any additional information, clarify the interpretation of their responses, and minimize researcher bias. We audiotaped and transcribed each focus group, and then reviewed and discussed the transcribed interviews for reliability prior to analyzing them.

### 2.3 Data Analysis

Applying a deductive approach, we first developed the code book using the interview questions as a guide. Then, using an inductive thematic approach to data analysis, four researchers independently coded a subset of three transcripts looking for emerging ideas and themes and developed new codes derived from the content while reviewing the transcripts. We assigned codes to segments of text that ranged in length from a phrase or sentence to a paragraph. In many cases, we applied more than one code to a portion of the text if we felt the excerpt fit within two areas. For example, a phrase referring to a negative outcome could also reference disclosure risk, and thus we would code that phrase twice.

When we reached full agreement on the use of codes (see Table 2), the four researchers also coded another subset of three transcripts to determine if they were using the new codebook consistently. After discussing and clarifying inconsistencies, researchers repeated the coding process on a second sub-set of transcripts. This process facilitated agreement between researchers and alleviated the need to calculate a kappa score. To ensure uniformity in the coding, three researchers worked in teams of two to code the remaining transcripts, after which each pair met to reconcile

**Table 2** List of codes and their occurrence within focus groups and frequency of comments

| Code | Groups | | References |
|---|---|---|---|
| | # | % | # |
| Negative perception<br>Morality, peer, friend, family influence that is bad, in a general way | 17 | 100 | 136 |
| Alcohol/opioids/other substances<br>Comparison of marijuana to alcohol or other substances being the 'same as' or 'no different than'; discussion of marijuana being a gateway drug | 17 | 100 | 126 |
| Education/knowledge/research<br>Discussion about the need for more training, more research, more education of the person or other professionals, knowledge of how the program works/program components | 17 | 100 | 122 |
| Methods of use<br>Discussion of use of cannabis, such as recreational or medical, where they obtain it (retail or clinic) and/or the purpose for which they use it, type they use, such as smoking, edibles, a cream, also discussion about dosage or frequency | 16 | 94 | 114 |
| Positive perception<br>Morality, peer friend family influence that is good, in a general way | 17 | 100 | 105 |
| Access process and barriers<br>Needing a diagnosis, being able to get a certificate, location of dispensaries, state applications | 17 | 100 | 103 |
| Laws<br>Regulation, laws, enforcement | 17 | 100 | 96 |
| Provider role<br>Statements regarding the role a provider could or should play, regarding such topics as prescribing cannabis, filling out certificates, talking to them about cannabis | 16 | 94 | 93 |
| Cohort/age/culture<br>Statements related to baby boom generation, different generations, comparison of young and old | 15 | 88 | 77 |
| Positive outcome<br>Good outcome that the person or family member has encountered such as better quality of life, used in place of other drugs, pain relief or relief of other symptoms | 16 | 94 | 65 |
| History<br>Personal history of use or experience with others using in general, not outcomes or perceptions | 14 | 82 | 61 |
| Disclosure risk<br>Statements about not talking or being afraid to talk about marijuana with family, practitioners, or socially; fear of retribution or social stigma *This can include advocacy to disclose or stand up for | 9 | 53 | 42 |
| Tax revenue<br>Any discussion about tax revenues | 13 | 76 | 28 |
| Negative outcome<br>Bad outcome that a person or family member has encountered such as bad side effects, an emergency room visit, overdose, fall, hallucination | 10 | 59 | 26 |
| Healthcare<br>Should insurance handle/pay for medical marijuana? | 8 | 47 | 17 |
| Pharma<br>Discussion on the role that pharmaceutical companies should or should not play in the cannabis market | 6 | 35 | 14 |

all disagreements prior to inputting the final consensus codes into QSR NVivo 11 software.

We conducted a thematic analysis by analyzing each code for frequently used words and phrases using NVivo's Word Cloud, Word Tree, and Word Frequency functions. Then, we expanded the frequent text and phrases to analyze the comments within each code. Once we identified important concepts within codes, we performed a combined analysis on codes that may have adjacent themes such as Positive Outcome and Positive Perception and across codes, as in the example of an opioid or other medication substitution that appeared across the coding categories of Positive Outcomes, Positive Perceptions, Provider Role and Alcohol/Opioids, and Other Substances. After performing this combined analysis, we worked to designate major themes in the data. To be categorized as 'major,' a theme had to appear in at least half of the groups within or across codes, and had to appear frequently enough within a group to depict substantial interest among participants. For example, a code that occurred in over half of the focus groups but was only mentioned once or twice within each group would not have been considered a major theme.

## 3 Results

Initial focus group analysis generated 16 coding categories, and analysis of these categories revealed five major themes: lack of education and research about cannabis, lack of provider communication, access to medical cannabis, outcomes of cannabis use, and apprehension about public disclosure. Participant quotations supporting the interpretation of textual data are presented below. Within a theme, the representing quote was taken from a different focus group.

### 3.1 Lack of Education and Research about Cannabis

Participants across all 17 focus groups discussed the need for education about the use of cannabis. Of the 122 comments that we coded as Education/Research, just over 70% involved the need to educate older adults about cannabis. In particular, participants were concerned with a lack of education available about the state's cannabis program, the positive and negative outcomes of cannabis use, methods available for taking cannabis, and individual cannabis dosage. These discussions also focused on the importance of being educated about how cannabis can be used for medical purposes rather than recreational use and offered specific suggestions about how to disseminate information effectively.

> "There ought to be people who write books about the use, the hazards, and all the different aspects of using marijuana for medical purposes. Older people are more likely to read, get more written materials, a lot of older people don't even deal with computers, so some written literature whether it be a book or well-organized literature that explains, really explains all the ins and outs, dos and don'ts …"

> "Why aren't the universities offering courses or information on marijuana in their newsletters, in their community bulletins, all those community courses? And in the newspapers, there are a lot of newsletters and things that we get or pick up that are focused to seniors, once lectures are planned at libraries or universities then use all those materials to publicize."

In addition to the concerns about the lack of education available to older adults, participants were varied in their understanding of and belief about whether adequate information exists as a basis for education. Some participants seemed to assume that enough information is available to educate others; however, a prominent theme across all 17 focus groups expressed a concern about the lack of research that exists on cannabis use and the challenges faced by researchers. Included below are some participant comments related to the theme of needing more research, which highlight older adults' opinions and concerns.

> "That's what's needed. Is a big study with 10,000 people or something, what's your ailment, what do you use, what brand, how often, dosage."

> "I totally agree with him that it really needs to be scientifically studied, declassified as the level of controlled substance that it is. People can have it and study its medical potential."

> "But what I did do was go to my oncologist and say here's what I'm considering, what are your thoughts on it? Have you done any research? And her comment was that there's very little research done in regards to cancer."

These comments highlight the awareness older adults have about the importance of providing education conducted by reputable sources, such as aging experts or state cannabis programs, to older adults who are interested in using cannabis for medical purposes and a need for research on the outcomes associated with cannabis use. This theme also considers the role that participants want healthcare providers to assume in educating patients about cannabis use and is closely related to the next theme that emerged from the analysis.

### 3.2 Lack of Provider Communication

When discussing cannabis use, participants in 16 of the 17 focus groups expressed a preference to discuss cannabis with their healthcare providers, the individuals from whom they have established relationships with and are valued sources of information. For example, participants reported a lack of openness in providers about discussing cannabis which inhibits their communication with them:

> "I think they (healthcare providers) should be a lot more open to discussing it with their patients."

> "I think they should be a lot more open to learning about it and discussing it with their patients. Because at this point I have told my primary care I was using it on my shoulder. And that was the end of the conversation. He didn't want to know why, he didn't want to know about effects, didn't want to know about side effects, didn't want to know anything."

However, they also expressed concerns about the lack of knowledge among providers about the use of cannabis for medical purposes:

> "… you can get a medical marijuana card but unless you have a doctor that is knowledgeable to tell you what you need to get, you know whether its edibles or

whatever, or whether it's the oils or you should smoke it …"

"I think it is good doctors are making themselves aware of it, I think the medical community, in all states, especially where it's been legalized, they need to make themselves more aware."

Participants felt that providers should work to educate themselves about the clinical issues such as dosage and method of usage, along with potential benefits and risks in treating older adults. In addition to engaging their healthcare provider as a source of knowledge about cannabis use, the participants discussed the role of the healthcare provider in terms of providing a means to acquire medical cannabis by offering to discuss and recommend participation in the state medical cannabis program.

### 3.3 Access to Medical Cannabis

All 17 focus groups discussed access to medical cannabis, which we coded 103 times. Much of the discussion within this theme focused on the medical cannabis card that is required to gain access to the medical cannabis dispensaries. On the one hand, the medical cannabis card allows for less expensive access to cannabis than recreational dispensaries:

"I've got an appointment to see a doctor to get a card because I'm spending so much money at XX [retail store] that I think it's more cost effective to go and get the card."

On the other hand, individuals said that their primary physicians were unable or unwilling to provide a certificate, the document required to access cannabis from the dispensary. These participants had all sought an alternate physician to provide their certification to secure a state medical cannabis card or in some cases, resorted to using a recreational cannabis dispensary. However, many of the participants indicated that they preferred to work with familiar doctors with whom they had already built a relationship and who knew their medical history. They also expressed financial concerns about not visiting their usual care providers, particularly when the authorizing physicians were not within their provider networks and would not bill insurance for medical cannabis (or "red card") evaluations.

"I originally got my red card from my former primary care physician who retired, but whoever took over for her wouldn't renew it for me … we're part of XX community health and the federal government so I had to go pay someone a lot of money to get my red card again."

"In my opinion, if there's sort of a weak point in the process of involving the medical establishment, I think it's just a lot of it depends on the doctor that you go to."

Participants made clear that the source of access (dispensary or retail shop) was not necessarily aligned with the purpose of use as many people accessed recreational stores to obtain cannabis for medical use. Such an unexpected access pathway was shaped by deterring factors such as perceived ease of identifying a prescriber for the medical program, the cost associated with provider visits, or going outside of their health insurance network to find a provider. The discussion often led to a preference for accessing through providers and medical dispensaries, but not always doing so because of these factors. Researchers may view this as a blurring of the medical and recreational cannabis programs, or a simple consumer choice related to convenience of access points.

This theme draws attention to the need for public officials, program administrators, providers, and provider groups to consider the psychological and financial costs, such as out of network fees and red card evaluations, to their patients. Providers also need to acknowledge the medical risks of not directing their patients' selection of cannabis use, including the type of products they purchase and the dosage they take.

### 3.4 Outcomes of Cannabis Use

Although not all participants in the focus groups were users of cannabis, all 17 focus groups discussed the positive outcomes of cannabis use. Discussions about positive outcomes appeared across two adjacent codes, Positive Outcomes and Positive Perceptions, which resulted in a combined 170 references to this theme. While users readily identified the benefits of taking cannabis based on their own experiences, a large portion of non-users who believed that medical cannabis corresponded with positive outcomes relied on the experiences and reports of family and friends who used cannabis. Relative to empirical evidence, such personal connections seemed to provide sufficient evidence for some non-users to believe in the abilities of cannabis to address symptoms such as pain and sleep difficulties. When discussing positive outcomes, the discussion largely converged on two main themes. Focus group participants reported using cannabis to address a variety of medical symptoms, but primarily discussed the use of cannabis to control pain related to injuries or illness:

"For 20 years I suffered with intense pain with migraines. Did everything, did the Botox, did every drug you could possibly take, and all kinds of things and nothing worked, except marijuana – and it got rid of the pain."

"I have seen in my own situation, I live with a 9-10 pain constantly because of what I'm going through and

> I can take a tincture of THC during the day, and get the gripping pain relieved."

Older adults in the focus group also discussed the use of cannabis in place of other medications, especially opioids:

> "And she takes a lot of pain killers and antidepressants, regular prescription drugs that simply complicate her life, and MJ simplifies her life."

> "I've had some injuries from biking and skiing and fortunately I was up here and it was recommended to me and it worked, because I didn't want to take pharmaceutical drugs, but I would take something to take some of this pain and inflammation away."

Negative outcomes and negative perceptions of medical cannabis were also discussed across all focus groups for a collective 162 references. In contrast to participants' comments on positive outcomes, the discussion about negative outcomes and perceptions was less likely to converge around a specific theme. However, two areas in which the focus groups' comments about negative outcomes and perceptions converged were recreational cannabis use and younger people's cannabis use. Older participants felt that there was a difference between using cannabis for recreation and using it for medical purposes:

> "My wife does not use cannabis recreationally in any way, but she uses it topically for pain, and orally."

> "Medical marijuana, you don't self-diagnose, it's called medical for a reason, and I don't have a problem with it at all for anybody of any age. But for older people like you're describing, the consequences I think are very minimal, and often quite good."

A sub-theme in our study revealed that although study participants discussed recreational cannabis more negatively than medical cannabis, they felt that it was comparable to drinking alcohol, often asserting a preference for recreational cannabis over the negative effects of alcohol:

> "I guess the one thing that confuses me more than anything — why do we accept alcohol as socially acceptable when it does far more damage than anything I've ever seen marijuana do."

> "And the older I get the more societal problems I see with alcohol that don't exist with cannabis and so the less I worry about it."

Additionally, discussion about recreational use as negative closely coincided with discussion of younger people's use of cannabis:

> "But then when you carry forward this increasingly potent drug, and make it available, available enough that the kids can get their hands on it, their little brains aren't ready for it."

> "They've genetically played around with that plant that they've got it so strong that a young kid without experience or good guidance it could ruin their life for a long time."

> "But there's still substantial research done about the effects, and specifically the aging, in the US and British studies, the use of pot the use of marijuana by elderly people, in terms of the effects on the brain, the areas of the brain that it effects, it may actually be positive, and it's just the opposite for younger people."

While discussing outcomes, study participants distinguished the difference between using cannabis, regardless of how they obtained it, when they were young vs. when they were older. Most were quick to comment that 'it was different' now that they were older. They no longer bought it to use recreationally (i.e., at a party) but now use it to manage conditions and symptoms they had acquired as they aged.

### 3.5 Apprehension of Public Disclosure

A fifth theme concerned older adults' apprehension to publicly disclose their use of cannabis. Although this theme was not prominent across all focus groups (only occurring in 9 of 17 groups), apprehension about public disclosure scored high in frequency, especially in groups that had more users than non-users. Participants discussed the negative public perception attached to cannabis use, regardless of its legality:

> "That's personal, and people are, some people are still offended by marijuana. They really are — and I think it's hard to get that information out, because of stigma, anonymity, 'you're a little pot head!' Nobody wants that label."

> "I've found there's still a stigma with older adults in using marijuana. I guess it's from the reefer madness situation, but uhh, there is a stigma."

A key part of this conversation reflected lifelong views of cannabis as being harmful or deviant. Some participants, for example, referred to the movie "Reefer Madness" (1936) and other anti-marijuana propaganda adverts that negatively framed cannabis as immoral and illegal. Others discussed the public information campaigns implemented as a part of President Nixon's war on drugs, a time in which cannabis was formally classified as a Schedule I narcotic. Thus, given this life course perspective, participants recognized how legalization may lead some older adults to consider using cannabis, but also recognized how many other older adults and their doctors would maintain a negative attitude and not

endorse its use for medical purposes or otherwise. Indeed, other comments revealed how some older adults were fearful about disclosing their use of cannabis to family members, friends, or their doctors because of the perceived stigma.

## 4 Discussion

Analyzing the responses from 137 older focus group participants from across the state of Colorado, we identified five major themes concerning cannabis use among older persons. To our knowledge, this is among the first studies to assemble a large sample of older adults with varying experiences with cannabis and conduct in-depth focus groups to gather their perspectives. While the study sought to determine perceptions, experiences, and outcomes for both recreational and medical cannabis use, the focus group discussion often turned to the use of cannabis for medical purposes. To us, this underscores the fundamental difference between older and younger persons—as people age, their attitudes, experiences, and outcomes of cannabis use are uniquely shaped by their own experiences. With age, individuals are more likely to experience a disease or disability, they are more likely to experience pain and other negative symptoms, and they are more likely to consider cannabis for such 'medical' purposes as suggested by the age period cohort paradigm.

Medical uses for cannabis for a wide range of conditions have gained acceptance as legitimate, reportedly based on personal experience with use or observation of benefit in their social networks. This may represent a 'tipping point' of population experience that has led individuals to associate cannabis with familiar beneficial purposes rather than categorizing it as either unfamiliar or with illicit drugs. This could also be relevant within this age group specifically. A recent literature review on medical cannabis use across all age groups indicated that there are often blurred boundaries between cannabis use for reported for medical and/or recreational use. However, fear of stigma caused some participants to ensure a delineation between medical and recreational use [30]. Similar to that outcome, the older participants in our study were clear on the distinction between using for medical purposes vs. using for recreational purposes. Recreational use was viewed more variably, with many associating it with societal risks and others comparing it favorably against alcohol. Broader population studies on attitudes are required to verify this interpretation.

Within the context of this broader acceptance of medical uses for cannabis, the key themes articulated views on issues related to access, relative risks and benefits, and the importance of linking cannabis use for medical purposes with their other healthcare services. The interpretations of the findings below focus on societal and particularly health provider communication about cannabis, the perception that cannabis is a useful alternative to opioids, and the ongoing importance of stigma against cannabis use by society broadly, and by the healthcare system in particular.

### 4.1 Perceptions of Stigma

Because Colorado is one of the more liberal states where both medical and recreational cannabis is legal, we did not expect that some older adults would still feel reluctant to disclose their cannabis use, especially for medical purposes. Although participants in our study felt there was a distinct difference between medical and recreational cannabis use, they held similar negative views of recreational cannabis. Similar to our findings, Bottorff et al. [31] found that the reported experiences of stigma were related to negative views of cannabis as a recreational drug. Our focus group participants often associated recreational cannabis use with youth and carelessness, but asserted that recreational cannabis use was comparable, and sometimes preferable, to drinking alcohol.

As the participants in these focus groups requested, educating consumers, providers, and the public about the outcomes of cannabis use may be one method to lessen the uncertainty associated with using medical cannabis. State cannabis programs can play a vital role in educating consumers and the general public about the value that medical cannabis has for older participants such as pain relief. Healthcare providers can also play a role in shaping the stigma surrounding medical cannabis by addressing patients' questions about cannabis risks related to various use options (e.g., dose, means of ingestion).

### 4.2 Communication Barrier to Cannabis Access

Older adults expect that they should be able to consult with and, when appropriate, obtain a certificate to enroll in the state program from their primary providers who likely understand their patients' medical histories and have established records of trust. Older adults view patient-provider relationships as an integral part of providing good healthcare [32, 33]. However, testimonies from focus group members indicate a reluctance to discuss medical cannabis with providers out of fear of a negative reaction. Participants commonly stated that stigma is sustained by attitudes of providers as well as the lay public, even in a context of legalization of access. This finding is consistent with other studies that have also identified disclosure of use and other communication with providers as an issue [30, 31].

Ultimately, the lack of available education and research combined with older adults' reluctance to discuss cannabis use with their providers can be problematic. Researchers have linked good physician-patient communication to patient health outcomes [34]. Reluctance to discuss the use

of cannabis creates a situation in which the older consumer might only be able to access information from non-providers, such as dispensary staff, or rely on word-of-mouth experiences from friends or acquaintances. The consumers in this study requested basic information about how the "marijuana program" works as well as information about the forms of cannabis that are available. Participants also requested cautionary notes about risks and unsafe practices related to cannabis use. Given this context in which medical providers, and healthcare systems in which they work, may not step up to offer such education, public health educational outreach efforts can serve a critical consumer protection role at a time when usage rates are rapidly increasing. As participants noted, many mechanisms already exist for disseminating information to older adults, including libraries, the Area Agency on Aging network, and universities and colleges with outreach programs, and expanding education efforts in such venues may help address the gaps observed by older adults in Colorado.

### 4.3 Outcomes Associated with Cannabis Use

Participants in our focus groups who used cannabis reported a variety of diagnosed conditions and symptoms including nausea, troubled sleep, lack of appetite, fatigue, and anxiety. However, they most commonly discussed using cannabis for pain control. Interestingly, participants who are not users spoke consistently (with a small number of exceptions) in favor of medical uses of cannabis for pain, and almost universally described their personal knowledge of someone who had benefited from taking cannabis. Our results are similar to other studies that report pain as the most often cited reason for cannabis use [9, 35]. Participant discourse about cannabis use for pain relief often turned to the use of medical cannabis in lieu of prescription pain medications. Participants also indicated a distaste for and sometimes fear of the side effects and addiction associated with opioids. Similar to our results, a recent study examining the substitution of cannabis for one or more of alcohol, illicit drugs, or prescription drugs showed that 80.3% of respondents reported substituting cannabis for prescription drugs [36].

Pain control and the overuse of opioids are common comparison points in discussions of cannabis use for pain. Kaskie et al. [16] suggest that legalized medical cannabis might become a viable policy alternative to address prescription medication substitution. The opioid epidemic in the USA is growing at an alarming rate and many states are looking to medical cannabis as a means to control opioid use [37]. A recent study found that states with legalized medical cannabis laws have seen lower opioid overdose death rates compared with states that ban cannabis [38]. To date, New York and Illinois have passed legislation introducing medical cannabis as a substitute for opioid prescriptions as one approach to addressing the opioid epidemic [37, 39]. Although the federal government has not changed its stance on legalizing cannabis, the Senate Special Committee on Aging has discussed medical cannabis as a potential substitute for opioid use in older adults [40].

## 5 Conclusions

We explored older adults' perspectives on cannabis use in Colorado in a more open-ended manner than previous survey research afforded. The analyzed narratives generated five themes that reflect the attitudes and perceptions about cannabis use, and outcomes experienced by older adults in Colorado. Participants focused on medical use, especially for treating pain. They also expressed a strong desire for educational opportunities and mainstream medical guidance about cannabis use. We advance scientific understanding by offering medical researchers insights into what might constitute important foci for future investigations and by providing information for clinicians who increasingly interact with older patients who inquire about the use of 'medical' cannabis. This work also can inform discussions among policy makers, public health officials, and program administrators who are most concerned with the increasing cannabis use among persons aged over 60 years. Lessons learned from the experience of older adults in an early adopter state such as Colorado can inform the efforts of other states who have legalized or are considering the legalization of cannabis for medical or recreational use. This state of Colorado provided a unique context in which individual attitudes and experiences were shaped by some of America's most expansive frameworks concerning the legal access to both medical and recreational cannabis.

### 5.1 Study Limitations

When interpreting our study results, readers should keep in mind some limitations to our findings. Although we did our best to sample individuals from the Area Agencies on Aging across the state of Colorado, we were not able to reach participants in all regions. Additionally, women represented 66% of our respondents and 94% were white; therefore, this was not a representative sample. Finally, the extent to which these findings can be generalized beyond the state is limited. Variations across states in cannabis laws and regulations likely also reflect variations in citizens' attitudes and desire to use cannabis, generating a need for more systematic exploration of the themes of importance to these participants.

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## Compliance with Ethical Standards

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**Conflict of interest** Julie Bobitt, Sara Qualls, Melissa Schuchman, Robert Wickersham, Hillary Lum, Kanika Arora, Gary Milavetz, and Brian Kaskie have no conflicts of interest that are directly relevant to the content of this study.

**Ethics approval** We received approval from the Institutional Review Boards of the University of Colorado Colorado Springs and The University of Iowa for this study.

**Informed consent** All participants provided their consent before taking the survey and participating in the focus groups.

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