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Preferences for Medical Marijuana over Prescription Medications Among Persons Living with Chronic Conditions: Alternative, Complementary, and Tapering Uses

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Abstract

Objectives: Despite expanded legalization and utilization of medical cannabis (MC) internationally, there is a lack of patient-centered data on how MC is used by persons living with chronic conditions in tandem with or instead of prescription medications. This study describes approaches to use of MC vis-à-vis prescription medications in the treatment of selected chronic conditions.

Design: Participants completed semistructured telephone interviews with open-ended questions. Content analysis of qualitative data identified themes and subthemes relating to patient approaches to using MC products.

Participants: Thirty persons (mean age = 44.6 years) living with a range of chronic conditions (e.g., rheumatoid arthritis, Crohn's disease, spinal cord injury/disease, and cancer) who had qualified for and used MC in Illinois.

Results: Participants described a range of approaches to using MC, including (1) as alternatives to using prescription or over-the-counter medications; (2) complementary use with prescription medications; and (3) as a means for tapering off prescription medications. Motives reported for reducing or eliminating prescription medications included concerns regarding toxicity, dependence, and tolerance, and perceptions that MC improves management of certain symptoms and has quicker action and longer lasting effects.

Conclusions: MC appears to serve as both a complementary method for symptom management and treatment of medication side-effects associated with certain chronic conditions, and as an alternative method for treatment of pain, seizures, and inflammation in this population. Additional patient-centered research is needed to identify specific dosing patterns of MC products associated with symptom alleviation and produce longitudinal data assessing chronic disease outcomes with MC use.

Keywords: medical marijuana, cannabis/cannabinoids, symptom management, pain, harm reduction

Introduction

AS LEGALIZATION AND UTILIZATION of medical cannabis (MC) continue to expand in the United States and internationally, a small, but growing body of evidence supports the use of cannabis and cannabinoids for their analgesic, anticonvulsant, and antispasmodic properties in the treatment of a range of chronic conditions.[1,2] Although most clinical trials have studied oral or mucosal cannabinoids, the vast majority of legal products used by patients is sold at MC dispensaries and consists of marijuana flower, gums, oils, and edible products derived from *Cannabis* plants.[1] Given the relatively small evidence base centered on pharmaceutical cannabinoids and the rapid proliferation and distribution of medicinal-grade cannabis to persons living with chronic conditions, a sizeable knowledge gap now exists regarding how and why persons living with chronic conditions actually use MC.

Legal prohibitions against marijuana have severely constrained the scope and amount of clinical research into the

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use of MC. In the United States, marijuana's classification since 1961 as a Schedule 1 controlled substance has curtailed research into its medical properties. Reviews of the sparse clinical trial research on medical forms of cannabis indicate that cannabinoids demonstrate significant beneficial effects on chronic pain,[2] including neuropathy.[3] Cannabinoids have also been shown to alleviate patient-reported spasticity in persons with multiple sclerosis.[2,4]

Even fewer clinical studies have been conducted on inhaled cannabis, which is the most common form of MC.[1] A few small studies have used patient-reported data to investigate symptom alleviation associated with inhaled cannabis. Smoked cannabis has been reported to decrease neuropathic pain in persons living with HIV[5,6] and reduce pain and improve sleep among persons with chronic neuropathic pain.[7] Significant reductions in pain and spasticity were reported in a study of persons with multiple sclerosis who smoked cannabis,[8] and when inhaled twice daily, cannabis has been found to decrease symptoms of Crohn's disease.[9] Recently, a study of persons with painful diabetic neuropathy who smoked cannabis found decreased spontaneous pain,[10] and vaporized cannabis has been associated with decreased neuropathic pain.[11]

Emerging research has shown that patients may use MC in combination with or instead of prescribed pharmaceutical agents to manage pain.[12–14] In addition to reported better symptom management through use of MC, patients in these studies cited concerns regarding side-effects and dependency as motives for reducing their pharmaceutical use and increasing MC use.[12,13] A recent study reported a 64% reduction in opioid use as a pain medication among MC users.[15] Such findings suggest a harm reduction approach among patients using MC to minimize potential harm associated with prescription opioid use. From a population perspective, recent ecologic studies in the United States report that states with MC laws have seen reductions in opioid overdose mortality,[16] opioid prescriptions among Medicare patients,[17] opioid treatment admissions,[18] and presence of opioids in fatal automobile accidents.[19]

Despite the potential of MC to address a range of symptoms of chronic conditions, there is a lack of patient-centered data on how cannabis is used, in addition to or instead of prescription medications, by persons living with chronic conditions. The proliferation of dispensaries and MC products in the absence of tightly controlled clinical trial data has accelerated the need for additional research into patients' perspectives, motives, and utilization of MC. This study describes approaches to use of MC vis-à-vis prescription medications in the treatment of selected chronic conditions.

Methods

Data examined in this study derive from a larger study of patient and provider perspectives on MC and discussions in clinical settings regarding its use. This paper reports our analysis of the patient group and patient preferences for using MC vis-a-vis prescription medications to treat a range of chronic health conditions.

Recruitment

MC patients in Illinois were recruited through flyers distributed to selected MC dispensaries in the state. Dispensaries also forwarded electronic versions of the flyers through social media networks. Participants reported learning of the study at dispensaries in the Chicago metropolitan area (63.3%) or through postings on Facebook (36.6%). Persons interested in participating contacted study personnel by phone for a brief eligibility screening interview. Persons were eligible if they were 18 years or older, reported having one of the 39 qualifying health conditions for MC in Illinois, and had smoked MC in the past 3 months. Because of the focus on stigma related to smoking cannabis that informed the larger study, participants were not assessed for use of other MC ingestion methods at screening.

Study personnel scheduled telephone interviews with eligible persons and emailed the informed consent for review before the interview. Thirty-six persons responded to the flyers, expressing interest in participation, and 30 consented to and completed individual interviews (three persons were determined to be not eligible at screening due to lack of qualifying condition, and an additional three met eligibility criteria, but did not respond to phone calls after their interview had been scheduled). After participants had the opportunity to review the consent form and ask any questions, informed consent was obtained verbally immediately before each interview. The research protocol was approved by the Institutional Review Boards at DePaul University and Rush University.

Data collection

Our team developed a semistructured interview guide to explore patient perspectives on cannabis use and communication of these perspectives to their healthcare providers. Open-ended questions were designed to elicit specific and contextual data regarding patient attitudes, beliefs, and behaviors. The guide was structured in four distinct sections to assess (1) patient management of symptoms and side-effects, (2) discussions about cannabis use with medical providers, (3) beliefs regarding medicinal or therapeutic use of cannabis, and (4) recreational use of cannabis. Data analyzed in this paper were drawn chiefly from the symptom management section ("Can you tell me about the last time you used cannabis to manage symptoms you were experiencing?" "In your experience, which symptoms do you find that cannabis is helpful in managing?").

Interviews were conducted by the first and second authors. Length of interviews ranged from 31 to 77 min with a mean length of ~47 min. All interviews were digitally recorded and then transcribed by a professional transcription service. Once each transcript was cross-validated with its digital recording, the digital recording was destroyed. Each participant received, through e-mail, a $30 Amazon.com gift card for their participation.

Data analysis

Content analysis is a qualitative method that involves close reading of text for the purpose of identifying patterns within the data.[20,21] Inductive coding procedures without the use of preexisting categories allow for concepts and typologies to emerge from the participants' descriptions of their own experiences. Content analysis typically involves two stages—(1) coding text by developing descriptive labels or "themes" that might apply across multiple cases and

(2) analyzing the emergent themes to group them into meaningful, larger categories.[20,21]

For this study, the first two authors coded the first 15 interviews to identify themes related to use of MC. Initial content codes were created by the lead author, and a coding scheme was created that included operational definitions of all codes. Subsequently, the coding scheme and corresponding data were analyzed by the team of all four authors to refine codes and identify broader categories related to the themes. Following this initial analysis, data from the subsequent 15 interviews were analyzed by the lead author using the refined coding scheme and checked for additional themes. The collaborative refining of codes and themes was then repeated until all categories and subthemes were identified across the entire sample.[20,22] No new themes or categories were identified at this point, indicating that data saturation had been reached.

Results

Summary of findings

Our analysis identified a range of approaches to MC use: (1) as an alternative to prescription medications; (2) as a means to taper off prescribed medications; and (3) complementary use with prescribed medications. Our results below are organized around these approaches, and we include direct quotes from participants that illustrate these approaches and themes within each. Participant characteristics appear in Table 1.

MC use as alternative to prescription drugs

The approach most frequently reported by participants constituted using MC as an alternative to other medications—most commonly opioids, but also anticonvulsants, anti-inflammatories, and over-the-counter (OTC) analgesics. We have organized these results below into three subsections: opioids, other classes of medications, and multiple classes of medications. In each subsection, we present participants' reported motives for this approach to use of MC and include longer representative quotes in Table 2 illustrating these motives.

Alternative to opioids. Motives for using MC as an alternative to prescribed opioids included MC (1) acting more quickly, (2) having longer lasting effects, (3) reducing potential harm, (4) better managing symptoms, and (5) having fewer side-effects. Several participants reported quicker action with inhaled cannabis than with oral prescription medications, whereas one participant living with chronic regional pain syndrome reported similar effects using MC only in an oil application (Table 2). In general, participants reported the effects of MC lasted longer than prescribed opioids ("I find that it's longer lasting—as far as taking care of your symptoms—than anything else"). Several described experimenting with different MC products and strains and finding certain ones to be much more long lasting than other forms of prescribed pain medication, including the participant living with post-traumatic stress disorder (PTSD) quoted in Table 2.

Risk of addiction to opioids was reported as a significant concern by many participants, and MC use was viewed as a harm reduction measure that could provide as much, if not

TABLE 1. PARTICIPANT CHARACTERISTICS

	M	SD
Age	44.6	15.9

	N	%
Gender		
Male	19	63.3
Female	11	36.7
Race/Ethnicity		
White	26	86.7
Latino/Hispanic	3	10.0
Mixed	1	3.3
Qualifying medical condition for MC[a]		
Rheumatoid arthritis	7	23.3
Spinal cord disease/spinal cord injury	6	20.0
Crohn's disease	6	20.0
Cancer	4	13.3
Hepatitis C	4	13.3
Post-traumatic stress disorder	4	13.3
Severe fibromyalgia	3	10.0
Other (chronic regional pain syndrome, epilepsy, HIV, multiple sclerosis, Parkinson's disease)	7	23.3
Preferred MC ingestion method		
Smoking *Cannabis* flower	18	60.0
Vaporization	6	20.0
Edibles	5	16.7
Topical oil	1	3.0
Pattern of MC use reported with prescription medications		
Alternative[b]	18	60.0
Tapering[c]	8	26.7
Complementary[d]	6	20.0
Daily MC use	27	90.0

[a]Participants may have indicated living with more than one condition.
[b]Defined as using MC intentionally instead of prescription drugs.
[c]Defined as using MC intentionally to taper off of prescription drugs.
[d]Defined as using MC intentionally with prescription drugs.
MC, medical cannabis; SD, standard deviation.

more, pain relief than prescribed opioids ("I mean it's not like cannabis is anywhere near as dangerous as a drug as Percocet"). The perceived harm reduction potential of MC use extended from addiction risk to concerns regarding overdose to toxicity of pain medications.

MC was viewed by some participants as providing better management of symptoms with fewer side-effects than opioids ("Back pain. Nausea, for sure…anxiety, fatigue, exhaustion. Helps out a ton better than prescription opioids that end up just making things worse."). Finally, several participants reported MC conferring multiple benefits over opioids, and these extended to multiple motives for preferring MC. As an example, one participant quoted in Table 2 and living with multiple chronic conditions described better management of symptoms, harm reduction concerns, and fewer side-effects as overarching motives for using MC as an alternative.

Alternative to other classes of medications. Participants who were prescribed neurologic agents for nerve pain and anticonvulsants for multiple sclerosis described both

TABLE 2. EXAMPLES OF MEDICAL CANNABIS USE AS AN ALTERNATIVE TO PRESCRIPTION MEDICATIONS

Alternative to opioids/narcotics

Quicker action	The topical cannabis relieves [pain] in a way that none of the narcotic medications do—and I was given a topical narcotic, too, 2 years ago that helped a little but not like this does. This is a dramatic and very quick release.—*65-year-old female patient with chronic regional pain syndrome*
Effects last longer	I'm trying to figure out different strains or potencies. … The last time my friend had what's called dabs. More potent tetrahydrocannabinol. And when I took one of those, I didn't have to take pain medication for 3 days. That was kind of a real big eye opener.—*38-year-old male patient with post-traumatic stress disorder, chronic back pain*
Better management of symptoms; fewer side-effects	I am prescribed Vicodin; however, I find myself taking them very, very infrequently, maybe one, or two a month.… I just I don't feel I have the need for it. I think smoking the marijuana provides me the ability and provides my immune system the opportunity to really get in there and do its own job. Smoking it helps me eat better, make better choices, move better. It just makes me, it's like wearing glasses for me, it just makes things more focused and easier. See clearly…. Vicodin strictly provides me to be able to sit there and not be in pain.—*64-year-old male patient with rheumatoid arthritis, neuropathy, hepatitis C*
Reducing potential harm	I'm not messing with my liver. I don't have the chance of overdosing. That's probably the main two things; that I'm not poisoning myself and I don't have the threat of overdosing if I'm using cannabis. I mean there's no way I could smoke enough to have an overdose.—*54-year-old male patient with fibromyalgia*
Multiple benefits	I was taking 180 Vicodins a month for pain and I became hooked on them… And now I don't take any pain—no narcotics whatsoever. I refuse to take them…. With Vicodin you get a shorter pain relief, especially with my kind of pain, the arthritis, which sometimes lasts a long time. And with the cannabis it lasts longer, and it's more effective… The Vicodins used to make me sick to my stomach and cannabis does not make me sick. If anything it makes me feel better in my stomach. —*62-year-old male patient with rheumatoid arthritis, spinal cord disease, PTSD*

Alternative to other prescription medications

Better management of symptoms; fewer side-effects	Nerve pain medications I feel like it takes most of my neurological pain away, it has been for the past few months… I stopped taking the Neurontin, and the Cymbalta, all that stuff that they gave me to help the nerve pain. I just stopped taking it, because it wasn't working. All it was doing was making me—some made me angry, some made me upset, some kind of just messed with your emotional state.—*32-year-old male patient living with paraplegia, nerve pain* Anticonvulsants The previous medicine made me feel like a zombie. It zonked me out. I was very—it made me feel even more weak, which is another symptom of multiple sclerosis. Your limbs are very, very weak, and heavy. That medication made it worse. And with the cannabis, it does not do any of that. I feel relief from it, when it comes to the spasticity, and I don't feel zonked out or a zombie. And it really helps with the pain.—*33-year-old female patient with multiple sclerosis*
ii. Fewer side-effects	Anti-inflammatories I'm trying not to take an nonsteroidal anti-inflammatory drug every day, because there are so many side-effects of nonsteroidal anti-inflammatories.—*51-year-old female patient with spinal cord disease, rheumatoid arthritis*
i. Better management of symptoms; reducing potential harm	OTC analgesics Instead of taking ibuprofen, which I used to take by the hundreds, I smoke pot instead…. And I've gone from buying my ibuprofen in bottles of 300 … I don't take them at all anymore. I totally got away from any painkillers other than the cannabis.—*65-year-old male patient with cancer, hepatitis C, rheumatoid arthritis*

Alternative to multiple classes of medications

Reducing potential harm	What I'm dealing with the hepatitis is the drugs that I take for the arthritis and some of the cancer-related and the anxiety stuff, they're not good for my liver. And that's a problem with my liver doctor, my hepatitis. So they made it legal. I started going to the clinic. The stuff I got was so good that I quit taking the ibuprofen.—*65-year-old male patient with cancer, hepatitis C, rheumatoid arthritis* I have had very adverse reactions to some of the medications in the past because I'm also diabetic… what good is it doing me, messing up my liver and my kidneys so that I can go in for an operation? To me it sounds senseless when all I have to do is just keep mobile, feel good about myself, do my exercise and watch how I take care of my health. And for me, I feel more comfortable smoking than taking all those medications. —*65-year-old female patient with rheumatoid arthritis, sciatic nerve damage*

(continued)

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TABLE 2. (CONTINUED)

Addresses multiple symptoms/ multiple benefits	I mean, everything that I've taken, I went down on pharmaceuticals, because I took medicine for anxiety, for depression, for epilepsy, and everything. So I no longer take any anxiety medicine over this last year. I used to take Xanax, and I took it every day. Now I take zero.—*39-year-old male patient with epilepsy, migraines, depression*
	Things that are kind of associated with Crohn's, inflammation, stomach pain, insomnia, loss of appetite. That's all just some of the symptoms I get from Crohn's and cannabis 100% helps alleviate everything that I've come across with Crohn's. So the pain pills that I was taking sometimes could take up to two hours to kick in…[now] off the anti-inflammatory with steroid and then the pain things. —*37-year-old male patient with Crohn's disease*
	Cannabis is very helpful in managing my sleep. And it also helps with my neuropathy, and my spasticity….Specifically to MS….Insomnia. The pain can be so unbearable that I cannot sleep. So the cannabis really does help ease the pain, and helps me go to sleep….When I find that helps is if I'm having an episode, and it happens all throughout my legs and my feet, if I do take a little drop of oil, or from a vape pen, it does really, really subside the pain, which—almost immediately. … The previous medicine made me feel like a zombie. It zonked me out. I was very—it made me feel even more weak, which is another symptom of MS—*33-year-old female patient with multiple sclerosis*

OTC, over-the-counter.

improved management and fewer side-effects with MC over prescription medications. By contrast, participants who reported using MC as an alternative to OTC analgesics reported better management of symptoms and reduced potential for harm (to the liver) as motives, while those using MC as an alternative to anti-inflammatories reported a better side-effect profile.

Alternative to multiple classes of medications. Finally, a number of participants described motives for reducing harm by using MC as a replacement for multiple categories of medications, as well as multiple benefits from replacing a range of medications. Such benefits included improved sleep, reduced pain, improved appetite, less toxicity and adverse reactions, and reduced anxiety. In some cases, MC was perceived as conferring improved management of multiple symptoms, as suggested by participants living with epilepsy, Crohn's disease, and multiple sclerosis.

Complementary use

Participants reported using MC in combination with medications such as opioids, antinausea medications, OTC analgesics, and benzodiazepines. Such complementary use typically was not only associated with a need to manage side-effects of prescription medications (e.g., nausea, insomnia, and dystonia) but also used purposefully in combination with other medications to manage symptoms effectively. Representative quotes illustrating the range of complementary use appear in Table 3.

In terms of managing side-effects, some individuals described using MC in addition to prescription medication for treatment side-effects ("if I were to take a [pain] pill, within an hour I'll feel really groggy…and my stomach won't feel good, it'll hurt. After I smoke all those side-effects kind of mellow"), while others used cannabis exclusively. In particular, participants managing epilepsy reported insomnia-related side-effects associated with

treatment, and MC was viewed as an effective means of decreasing insomnia (Table 3).

MC was also used in combination with prescription medications to alleviate symptoms associated with their chronic conditions. Pain was the most commonly reported symptom managed in this manner, while several participants described using MC in tandem with prescription medications to manage anxiety. For pain management, most complementary users reported using MC only in combination with opioids or with OTC analgesics, but one participant delineated a graduated approach to managing spinal pain using a range of methods (Table 3).

Although MC was viewed as an effective approach to managing symptoms in combination with prescribed medications, many participants were motivated to include MC in their repertoire to decrease the amount of prescribed medications they were ingesting ("I wonder what damage they are eventually gonna do to my organs, so I have been using cannabis more these past couple of weeks because of that"). The perceived need to reduce the amount of medications extended across drug classes such as opioids, OTCs, and benzodiazepines. This finding suggests patients' MC use may eventually decrease or replace reliance on prescribed medications. In the next subsection, we describe in more detail how participants intentionally use cannabis to taper off prescription medications.

Tapering off prescription medications

Drug classifications that participants reported using MC to taper off included anticonvulsants, anti-inflammatories, and pain medications. Opioids, in particular, were often viewed as problematic because of toxicity, dependence, and tolerance, yet stopping "cold turkey" was not viewed as a realistic option ("I'm realizing with the opiates, I got to reduce and quit, but you can't just quit something like that").

Side-effects associated with anticonvulsant medications motivated some participants to want to reduce their use

TABLE 3. EXAMPLES OF MEDICAL CANNABIS USE AS A COMPLEMENTARY APPROACH WITH OTHER MEDICATIONS

Used to manage side-effects from prescription medications	[Cannabis] helps me sleep better in the evening… epilepsy patients in general, especially ones that have been on medication for years, they have a hard time sleeping. … a lot of the pharmaceuticals that these patients take, somehow it makes you an insomniac.—*39-year-old male patient with epilepsy* The medication makes me have something called dystonia…. the arm gets really stiff, and the muscles get like really tight and the pain comes from that… So what it [cannabis oil] is doing now is helping me manage the medication and manage the pain.—*54-year-old female patient with Parkinson's disease* My nausea kind of comes in waves. I am prescribed medication for my nausea and that's very helpful, but the marijuana just seems to help more.—*64-year-old male patient living with hepatitis-C, rheumatoid arthritis*
Used with prescription medications to manage symptoms	So if I have pain, the first thing I do is stop what I'm doing. …. If that's not enough, then it's put a heating pad on it and sit there for 20–40 min to an hour or two with some high heat and maybe that will loosen it up. If that doesn't loosen it up, then I will take some cannabis. If the pain persists then I'll take Vicodin.—*58-year-old male patient with spinal cord injury* I was taking Vicodin on a regular basis. I wouldn't say I was dependent on it. I would say I was taking maybe up to 10 a week. I was also taking Klonopin for my stress. So since I have started using the cannabis, that usage significantly dropped.—*64-year-old male patient with arthritis, neuropathy, hepatitis-C*

(dose and frequency), and several reported that MC helped them taper off of these medications (''As soon as I got my MC card I began to wean off of Gabapentin. In 3 weeks I was off of Gabapentin. So that is a good thing''). Reduced amounts of anticonvulsant medications with increased MC was viewed by participants with epilepsy as conferring equal if not more protection from seizures (Table 4).

Participants who reported anti-inflammatory medication use often described MC as aiding the taper typically associated with steroid regimens, including the participant quoted in Table 4. This same participant living with multiple chronic conditions also reported a strong desire to reduce multiple classes of prescription medications and stated that MC allowed her to do so.

Discussion

This study adds to the fledgling body of literature on MC use by patients who live with chronic health conditions. MC appears to complement prescription medications for symptom

TABLE 4. EXAMPLES OF TAPERING OFF OF PRESCRIPTION MEDICATIONS VIA MEDICAL CANNABIS USE

Opioids/narcotics	I'm weaning myself off. I was at four [pills] a day, and now I average maybe two—I'm getting to the point where I just want to get off of them because in reality they don't even help with any kind of pain anymore. Now it's just my physical dependence on that medicine.—*54-year-old male patient with fibromyalgia* At one point in time, I was taking a Vicodin every 3–4 h. Now I may not take a Vicodin for a week or two. I may take one a day. I may take a half of one. It really is as needed. So a 30-day prescription will last me 2 or 3 months. So the cannabis is doing its job regardless of what the doctors think. I know how bad Vicodin is for you.—*58-year-old male patient with spinal cord injury*
Anticonvulsants	I've used prescription medication for 26 years, Depakote, actually. And I've used 2000 mg each night. Now, I'm down to 500 mg daily [with cannabis]… So as far as the seizure control, I mean, to me, that's really something.—*39-year-old male patient with epilepsy* Gabapentin, if you're familiar, it's for seizure treatment and some side-effects of nerve pain. But the list of side-effects is frightening to say the least. I would not like the way I felt taking it. …. As soon as I got my medical cannabis card I began to wean off of Gabapentin. In 3 weeks I was off of Gabapentin. So that is a good thing. That's been a plus.—*58-year-old male patient with spinal cord injury*
Anti-inflammatories	I just got off of 3 months of steroids as well, which damages so many parts of your body…. I would not have been able to make that transition before the cannabis.—*51-year-old female patient with spinal cord disease, rheumatoid arthritis* Right now I'm trying to do a Prednisone taper. Because of the cannabis I'm on, it's the only reason I'm able to do this. I've been trying to get off this stuff for years. Finally, we're doing a taper and it's actually working.—*56-year-old female patient with HIV, hepatitis C, cancer*
Multiple classes of medications	I'm so used to being on these pills. You feel this pain and you just grab the bottle. I don't have to do that anymore. I want to get off of this crap. I've been on so many meds for the last 7 years between the chemo and all the other crap that I just want to start coming off of some of this stuff. Just for the side-effects related to the chemo, I'm on four or five meds. They said they could drop four of them, which was the Prednisone, Vicodin, Flexeril, and the Ativan…. Those go down as the cannabis use goes up.—*56-year-old female patient with HIV, hepatitis C, cancer*

management, alleviate medication side-effects, and provide an attractive alternative to treat pain, seizures, and inflammation in this population. In addition, our results indicate that MC may be used intentionally to taper off prescription medications. These findings align with previous research that has reported substitution or alternative use of cannabis for prescription pain medication due to concerns regarding addiction[12] and better side-effect and symptom management,[23] as well as complementary use to help manage side-effects of prescription medications.[12,13,24] We also found that patients' complementary and alternative use extend beyond prescribed opioids and nerve pain medications to include anticonvulsants, anti-inflammatories, and OTC analgesics.

Patients' concerns regarding dependence, toxicity, and side-effects associated with prescribed medications emerged as a dominant theme that extended across the complementary, tapering, and alternative methods reported by participants. Multiple participants viewed MC as a viable option for reducing potential dependency on opioids, toxicities associated with opioids, other analgesics, and anti-inflammatories, and side-effects associated with nerve pain medication, anticonvulsants, and opioids. The patient narratives in this study suggest that the scope of harm reduction appears to not only overlap across the complementary, tapering, and alternative approaches we observed but also potentially functions progressively over the course of chronic illness. Through the voices of persons living with chronic conditions, our results illuminate how MC may provide an option for them to actively address acute and long-term effects of prescription medications.

Intriguingly, participants cited multiple benefits conferred by MC as they used it to address a range of symptoms and side-effects, and thereby reduced their prescription medication use across multiple categories of medications. Our participants described a range of MC products used, including smoked flower, gum or "dabs," edibles, and topical oils. Additional patient-centered research investigating MC products is needed to inform dosing guidelines for relief from pain, spasms, inflammation, and other symptomatology that appear to respond to forms of MC. Several participants stated their preference for MC to prescription medications based on perceived quicker action of symptom alleviation. Whether this is due to the pharmacology of the particular products used or differing routes of administration exceeded the scopes of this study, but inhaled cannabis may be more rapidly absorbed into the bloodstream than orally administered routes of pharmaceutical agents. Similar findings regarding route of administration have been reported by chronic pain patients in a study comparing effects of inhaled cannabis and oral tetrahydrocannabinol.[25] More pharmacologic research is needed to more fully understand benefits associated with cannabinoids, phytocannabinoids, plant strains, and whole plant ingestion,[1,26–28] and their potentially synergistic effects on cannabinoid receptors in the neurologic and immunologic systems.

Our findings are limited by the potential for bias present in a small qualitative study, as our strategically recruited volunteer sample represents a fraction of the 12,000 persons who had qualified for an MC card in Illinois at the time of study enrolment. The sample is also limited geographically (recruited from metropolitan Chicago) and demographically (overwhelmingly white). Population-based data and robust clinical trials are needed to further explore and test the associations described by participants in our study. In addition,

we did not include lines of questioning regarding side-effects of MC or costs associated with its acquisition, although one participant reported feelings of cannabis "hangover" occasionally, and several noted that their use of MC was inhibited by cost concerns. Nonetheless, this study's qualitative methods allowed participants to explain their attitudes, beliefs, and behaviors in their own words and provide important patient-centered perspectives in this emergent research area.

Conclusions

MC appears to serve as both a complementary method for symptom management and treatment of medication side-effects associated with certain chronic conditions, and as an alternative method for treatment of pain, seizures, and inflammation in this population. In addition to expanded pharmacologic research on cannabis and cannabinoids, more patient-centered research is warranted to assess side-effects and costs of MC acquisition, to identify specific dosing patterns of MC products associated with symptom alleviation, and to produce longitudinal data assessing chronic disease outcomes with MC use.

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