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Original Research

Hand Surgery Patient Perspectives on Medical Cannabis: A Survey of Over 600 Patients

Lilah Fones, MD, ^{*} Clay Townsend, MD, ^{*} Harry Hoyen, BS, [‡] Frederic Liss, MD, ^{*} Mark L. Wang, MD, PhD, ^{*} Ari C. Greis, DO, ^{*,†} Asif M. Ilyas, MD, MBA ^{*,†}.

^{*} Rothman Orthopaedic Institute at Thomas Jefferson University, Philadelphia, PA

[†] Rothman Orthopaedic Institute Foundation for Opioid Research & Education, Philadelphia, PA

[‡] Sidney Kimmel Medical College, Philadelphia, PA

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Purpose: Medical cannabis (MC) has been proposed as a potential addition to multimodal pain management regimens in orthopedics. This study evaluates hand and upper-extremity patient perspectives of MC as a treatment for common orthopedic and musculoskeletal pain conditions. This study also aims to identify the proportion of patients already using MC, perceived barriers to MC use, and opinions on insurance coverage and legality of cannabis.

Methods: An anonymous cross-sectional survey study was conducted of all patients at least 18 years old presenting from October 2020 to January 2021 to a hand and upper-extremity outpatient clinic. The survey collected information regarding opinion on MC, including use, legality, and willingness to use MC in the future. Medical cannabis was legal in the states where the study was conducted.

Results: A total of 679 patients completed the survey (response rate 72.5%). Sixty-eight patients (10.0%) reported currently using MC. Of the 623 patients (90.0%) who reported not currently using MC, 504 (80.9%) would consider using MC for chronic pain, while the remaining 119 (19.1%) would not consider the use of MC for chronic pain. Age was not associated with whether a patient would consider using MC ($P = .16$) or was already using MC ($P = .10$). The most identified barrier to MC use was cost, reported as either expensive or not affordable by 477 patients (70.5%).

Conclusions: This study found that most patients presenting for hand and upper-extremity complaints would consider using MC (80.9%), and most perceive it as a safe treatment option for common orthopedic conditions. Moreover, 10% of patients reported already using MC. One of the major barriers to MC use is the cost. Most (90.9%) patients support policies for legalization and insurance coverage of MC.

Type of study/level of evidence: Therapeutic Level III.

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Pain management remains a major challenge in orthopedics. Surgeons employ a multitude of strategies to combat this challenge, including multimodal pain regimens and preoperative opioid counseling.^{1–3} A recent review of medical cannabis (MC) in orthopedic surgery proposed that MC may provide an additional pain management option for patients with chronic pain.⁴ Chronic pain, defined as pain that fails to respond to traditional pain control

regimens and lasts greater than 3 to 6 months, is one of the most widely recognized indications for MC use and has been reported to be the primary indication for MC use in two-thirds of patients presenting to MC dispensaries in the northeast.⁵

MC use has become more widespread in recent years and is currently legal in 36 states and 4 United States territories.⁶ This has been paralleled by a decreased perceived risk of cannabis use reported in a nationwide survey of United States citizens from 2002 to 2014.⁷ However, limited evidence exists on MC use in orthopedic surgery and on patient perspectives of this novel therapeutic. One descriptive qualitative study of spinal cord injury patients found that patients used MC when other pain management strategies failed and when they had both initiative and connections to educate themselves on MC use.⁸ Heng et al investigated

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Corresponding author: Asif M. Ilyas, MD, MBA, Rothman Opioid Foundation, 925 Chestnut Street, Philadelphia, PA 19107

E-mail address: asif.ilyas@rothmanopioid.org (A.M. Ilyas).

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musculoskeletal trauma patients' opinions on MC and found that most patients thought it could be effective in treating musculoskeletal pain.⁹ However, there is an overall paucity of research on hand and upper-extremity patient perspectives on MC. This patient population may differ from other orthopedic conditions in that many present electively, it includes conditions with a mix of acute and chronic pain and includes patients of a wide age range. Many other orthopedic subspecialties include a predominantly older population or see patients in the acute trauma setting.

The purpose of this study was to evaluate hand and upper-extremity patient perspectives of MC and its use in treating common hand and upper-extremity musculoskeletal conditions. We further sought to identify the prevalence of patients already using MC in this patient population, perceived barriers to MC use, and opinions on the legality of cannabis. We hypothesized that most patients would consider using MC for common orthopedic conditions, and that older patients would be more reluctant to use MC compared to younger patients.

Methods

Institutional review board approval was obtained prior to initiation of this anonymous cross-sectional survey study. From October 2020 to January 2021, all patients who were at least 18 years old and presenting for an office visit at a metropolitan academic institution with clinic sites across New Jersey and Pennsylvania were asked to participate in this study. All patients presented with a hand or upper-extremity complaint to 1 of 3 board certified, fellowship-trained orthopedic hand and upper-extremity surgeons. Medical cannabis is legal in both states where the survey was conducted, with New Jersey legalizing MC in 2010 and Pennsylvania in 2016. Patients completed a survey that was created by the study investigators regarding patient opinions of MC, including opinions of its legality, safety, costs, and potential barriers for use (Appendix 1, available on the *Journal's* website at www.jhsgo.org). Medical cannabis was defined in the survey as any publicly available legal MC product, which included topical, inhalational, and oral cannabis products. All survey responses were collected and stored electronically (SurveyMonkey Inc), with no identifying patient information collected as part of the survey. During the study period, 937 clinic patients were solicited to participate in the study. Categorical data were presented as counts and percentages and analyzed using chi-square tests. Statistical significance was set at $P < .05$.

Results

A total of 679 hand and upper-extremity patients completed the survey, consisting of 293 men (43.2%) and 386 women (56.8%). There was a survey response rate of 72.5%. Demographics of the study participants are presented in Table 1. Of all respondents, 91.8% (623/679) were aware that MC was legal in their local state for medical problems, including for chronic pain, anxiety, and opioid use disorder. In our cohort, 361 patients (53.2%) supported MC legality throughout the entire United States, and 237 patients (34.9%) supported both medical and recreational cannabis (RC) legality. Only 81 patients (11.9%) believed that MC should be illegal.

Sixty-eight patients (10.0%) reported that they were currently using MC for a state-approved medical condition. Patient age and education level were not associated with whether a patient was currently using MC ($P = .10$ and $P = .32$, respectively) (Tables 2, 3). The most reported indications for MC use were chronic pain in 47 patients (70.1%) and psychiatric disorder in 27 patients (40.3%). Zero patients reported using MC as a treatment for opioid use

Table 1
Respondent Demographics

Gender	N	%
Male	293	43.2%
Female	386	56.8%
Age (y)		
18–34	121	17.8%
35–49	157	23.1%
50–64	240	35.3%
65+	161	23.7%
Education		
High school	155	22.8%
College	296	43.6%
Graduate school	161	23.7%
Professional school	63	9.3%
None of the above	4	0.6%
Current medical cannabis use		
Yes	68	10.0%
No	611	90.0%

disorder. Two patients (3.0%) reported their indication for MC use was a medical condition besides chronic pain or a psychiatric disorder.

Of the 623 patients (90.0%) who reported not currently using MC, 504 (80.9%) would consider using MC for chronic pain conditions, while the remaining 119 (19.1%) would not consider using MC for chronic pain. Patient age and education level were not associated with whether a patient would consider using MC for a chronic pain condition ($P = .16$ and $P = .97$, respectively) (Tables 2, 3). The most selected orthopedic conditions that patients would consider using MC for were arthritis (57%) and back pain (55%) (Fig. 1). Most patients believed that MC was both safe for use to treat pain associated with common orthopedic conditions and was safer than prescription opioids (Fig. 2).

Patients identified numerous potential barriers to MC use, with the most selected barrier being cost (Fig. 3). The cost of MC was considered either expensive or not affordable by 477 patients (70.5%), while only 200 patients (29.5%) believed the price was inexpensive or appropriate. In our cohort, 617 patients (90.9%) supported insurance coverage for MC.

Discussion

The present study identified numerous findings regarding hand surgery patient perspectives of MC. The majority (80.9%) of patients reporting to hand and upper-extremity orthopedic surgery outpatient offices would consider using MC for chronic pain control or for pain associated with many common orthopedic conditions. As MC use increases throughout the United States and as more MC research continues to emerge, it is important for surgeons to understand how patients perceive these substances and what factors may represent barriers to use.

Most patients in our study reported that they would consider using MC for a variety of acute and chronic orthopedic pain conditions and believed it could effectively treat musculoskeletal pain. This is consistent with other orthopedic patient populations' beliefs on the utility of MC. In a survey of orthopedic trauma patients, 81% believed cannabis can be used as a medication, and 78% believed it could be used to treat acute pain.⁹ In a study of elective surgery patients at a large academic center, inclusive of both orthopedic and nonorthopedic procedures, most patients believed MC could be at least somewhat effective for postoperative pain (81%) and chronic pain (82%), and most patients (82%) would use MC if prescribed by a physician.¹⁰

Table 2

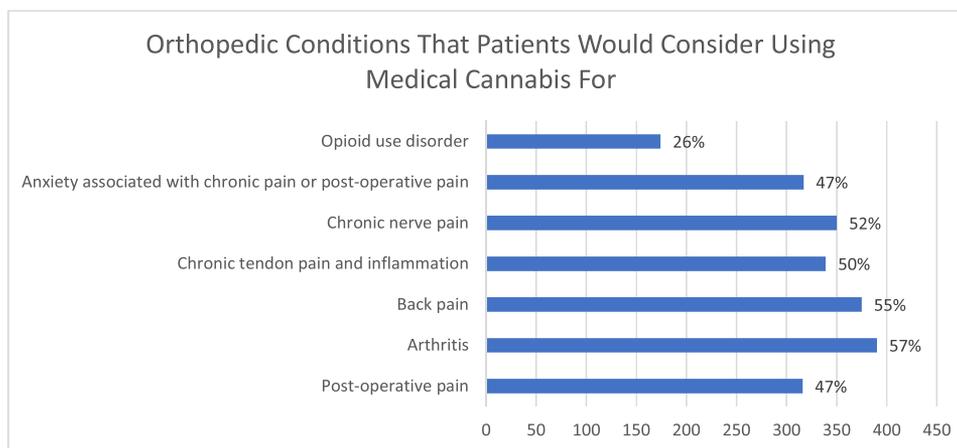
Percentage of Respondents in Each Age Range That Already Use Medical Cannabis (MC) or Would Consider Using MC

	Respondent Age (y)				P Value
	18–34	35–49	50–64	65+	
Respondents who currently use MC	5% (n = 121)	14% (n = 157)	10% (n = 240)	9% (n = 161)	0.10
Respondents who would consider using MC for an orthopedic condition	84% (n = 116)	82% (n = 139)	82% (n = 217)	75% (n = 150)	0.16

Table 3

Percentage of Respondents by Level of Education That Already Use Medical Cannabis (MC) or Would Consider Using MC

	Education Level					P Value
	High School	College	Graduate	Professional	None	
Respondents who currently use MC	13% (n = 155)	11% (n = 296)	10% (n = 161)	9% (n = 63)	0% (n = 4)	0.32
Respondents who would consider using MC for an orthopedic condition	80% (n = 143)	81% (n = 264)	82% (n = 154)	79% (n = 57)	75% (n = 4)	0.97

**Figure 1.** Orthopedic conditions for which patients would consider using medical cannabis treatment.

The positive patient response to MC as a potential pain control option brings into question the clinical effectiveness of MC in treating musculoskeletal pain. In multiple prior studies, cannabis users subjectively reported that cannabis provided effective pain relief.^{5,9,11,12} Of orthopedic trauma patients who used RC during recovery, 90% believed that it reduced their pain symptoms, and 81% believed it reduced the amount of opioids they required.^{9,12} Similarly, a survey of MC users, most being treated for chronic pain, revealed that 75% believed MC was effective in treating their pain and positively impacted their quality of life.⁵ Further, a study of orthopedic surgery patients found that preoperative RC users had lower pain scores and improved lower-extremity activity scores compared to noncannabis users.¹¹ Though most orthopedic surgery patients in the literature believe that MC is an effective treatment for pain, multiple review articles conclude that only low to moderate-quality evidence exists to support pain reduction with MC. These reviews also call for additional research on the safety, efficacy, and dosing of MC prior to making definitive conclusions on MC for pain management.^{4,13–20} To date, cannabis research has been limited by the federal classification of cannabis as a Schedule 1 substance, which has presented many barriers for researchers to perform high quality clinical trials.²¹

In our cohort, 74.7% of patients believed MC to be safe for treating orthopedic conditions and 74% of patients agreed or strongly agreed that MC was safer than prescription opioids for common pain conditions. While opioids are associated with many adverse outcomes including overdose and death, cannabis is likely perceived as safer as it is not associated with either of these critical major side effects.¹⁴ Despite this, other side effects of cannabis use must be considered. Cannabis use has been linked to negative mental health illnesses (including psychosis), impaired cognition, and increased rates of cardiovascular and cerebrovascular events.^{14,22,23} There is also a reported increased risk of motor vehicle collisions, including fatal accidents, in the acute setting following cannabis use.²⁴ Negative consequences of cannabis use have also been described in total joint arthroplasty, although the evidence is inconsistent. One study reported no difference in short-term outcomes in primary total knee arthroplasty with cannabis use,²⁵ while another reported an increased risk of revision associated with cannabis use disorder.²⁶ However, these studies are limited by the mixed inclusion of both MC and RC use.²⁷ Lastly, the impact of cannabis use on anesthesia should be considered. A recent review of the perioperative care of cannabis users highlighted increased incidence of hyperreactive airway, intraoperative hypothermia, and

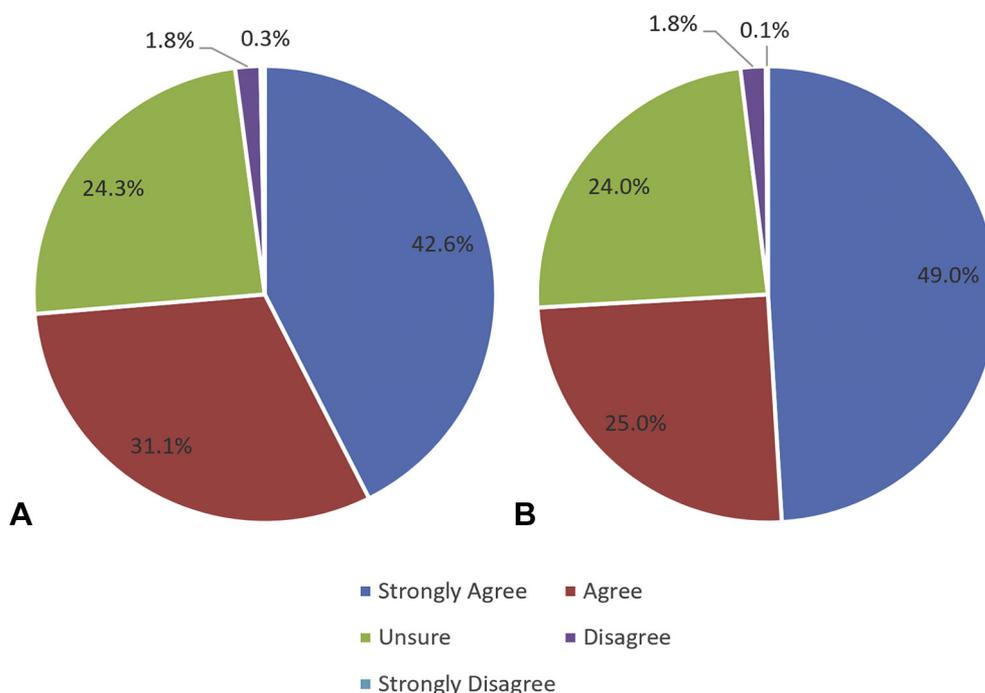


Figure 2. Graphs representing patient beliefs that medical cannabis is **A** safe for use for common orthopedic conditions and **B** safer than prescription opioids for common pain conditions.

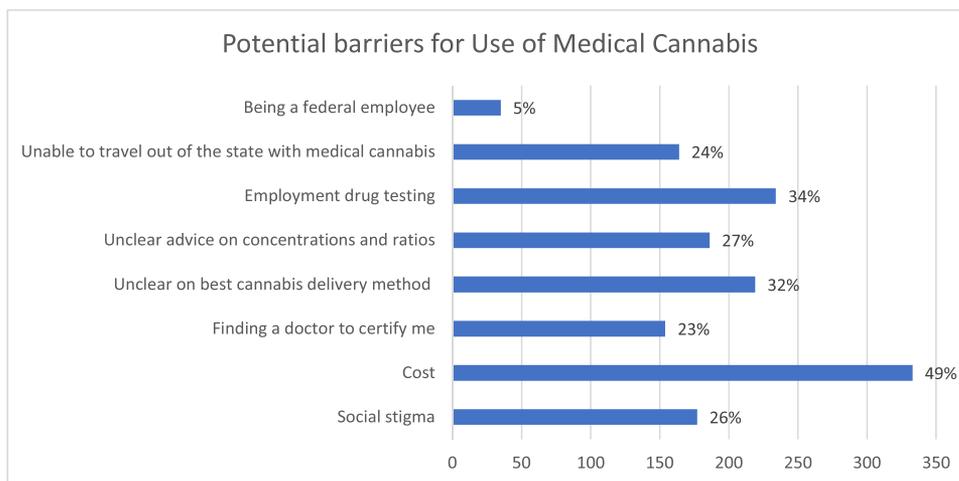


Figure 3. Percentage of patients that identify select barriers to the use of medical cannabis.

cerebrovascular ischemic events.²⁷ These studies are limited by the federal classification of cannabis as a Schedule 1 substance, and further studies are needed to better inform patients on the risks and benefits of MC.

Interestingly, despite our cohort's support for MC use as an alternative to opioids, only 26% believed MC could be used as a treatment for opioid use disorder. There is limited and contradictory evidence on the effects of cannabis on opioid use. One population level study found lower average opioid overdose mortality rates in states with legalized MC.²⁸ Another study of orthopedic surgeons prescribing opioids to Medicare Part D patients found a decrease in opioid prescriptions in states with legal MC.²⁹ Most studies on the impact of cannabis on opioid use in postoperative

patients focus on the effect of preoperative RC use on perioperative and postoperative opioid requirements. Increased postoperative opioid requirements have been reported for orthopedic trauma patients, and total joint arthroplasty patients who were RC users.^{12,30,31} In contrast, other studies reported no difference in opioid requirements for RC users among total joint arthroplasty patients and elective surgery patients, inclusive of orthopedic and nonorthopedic procedures.^{32,33} None of these studies reported specifically on the effects of legal MC use on opioid requirements. One study of total hip arthroplasty and total knee arthroplasty patients treated after surgery with dronabinol, a synthetic prescription cannabinoid, in addition to a standard multimodal pain regimen found a lower mean length of stay and lower average

opioid use.³⁴ Further studies are required to elucidate the impact of multimodal pain regimens inclusive of MC on opioid requirements in orthopedic surgery patients.

Cost was reported by nearly 50% of our patients as a potential barrier for MC use, and over 70% reported the cost as either “expensive” or “not affordable.” A previous study of MC users also revealed the most common negative aspect of MC use was the associated cost, where patients reported spending over \$2,000 per year on MC.⁵ The cost of MC varies by state and by specific product and is challenging to study, given the heterogeneity of the required quantity. A recent study by the Minnesota Department of Health found that the average 30-day cost per patient using MC to treat pain was \$314 in 2019.³⁵ Over 90% of patients in our cohort, greater than the number of patients that endorsed a willingness to use MC, supported insurance coverage for MC. Currently, no insurance companies cover MC.³⁶ Together, these findings support advocacy for policies that support patient access to MC.

This study has several limitations. First, MC use remains controversial, and this may limit our patients' willingness to report MC use and provide honest opinions on MC. We attempted to minimize this bias through collecting data anonymously, but this bias may still be present. The controversy behind MC may have impacted which patients responded to our survey, and thus, despite our favorable response rate of 72.5%, we cannot rule out non-response bias affecting our findings. Additionally, this study is conducted with patients presenting to outpatient hand and upper-extremity clinics in 2 states in which MC has been legalized for at least 4 years, therefore limiting the generalizability of study findings for patients in states where MC has been recently legalized or where it remains illegal. We defined MC as any legal MC (marijuana) product in our study survey (Appendix 1, available on the Journal's website at www.jhsgo.org), but investigating patient responses to specific MC products could be explored further in future studies. Further, our patient population consists of predominantly patients with health insurance, which limits the generalizability of study findings. Lastly, our study is limited in that we do not collect information on the patients' current pain levels, chronicity of symptoms, or RC use status, which could affect patient willingness to use MC. These variables may act as confounders of patient perception of MC, and these relationships should be explored further in future studies.

This study found that most hand and upper-extremity orthopedic patients presenting to outpatient offices would consider using MC, and most perceive it as a safe treatment option for common orthopedic conditions. Moreover, 10% of survey participants were already using MC. One of the major barriers to MC use is the financial cost. Most patients support insurance coverage of MC, suggesting that in the future insurance coverage could potentially offset the cost barrier to MC use. Further studies are necessary to evaluate the effectiveness of MC for the treatment of common hand conditions, as well as to better define the long-term safety and side effects of MC in this patient population.

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