

Endometriosis and Cannabis Consumption During the COVID-19 Pandemic: An International Cross-Sectional Survey

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Abstract

Introduction: Endometriosis affects 1 in 10 women worldwide, with most experiencing difficulties achieving adequate symptom control. These difficulties have been compounded by the onset of the COVID-19 pandemic due to worldwide shifts in health care resource allocation. As cannabis is a relatively common form of self-management in endometriosis, this study aims to explore the impact of the COVID-19 pandemic on cannabis consumption in those with endometriosis.

Methods: An anonymous, cross-sectional online international survey was developed and promoted by endometriosis advocacy/support organizations worldwide. Respondents needed to have a diagnosis of endometriosis and be aged between 18 and 55.

Results: A total of 1634 responses were received from 46 different countries. The average age of respondents was 30, with a mean diagnosis age of 25. Eight hundred forty-six respondents (51%) reported consuming cannabis in the past 3 months, with 55% of these reporting use for symptom management only. One in five respondents (20%) reported having consumed cannabis previously, the most common reason for discontinuation (65%) was access difficulties during COVID. Those who had legal access were more likely to consume cannabis than those without ($p < 0.0001$) and were more likely to disclose usage to health care professionals ($p < 0.0001$). The most common reasons for consuming cannabis during COVID was increased stress/anxiety (59%) and lack of access to normal medical care (48%). Pre-pandemic, cannabis was mostly consumed at least once a day (61%) and in inhaled forms (51.6%). Consumption increased for most people (57%) during the pandemic. During the pandemic just under a quarter (23%) of respondents changed their mode of consumption, with a reduction in inhaled forms (39.5%) and an increase in consumption of edibles (40%) or oil (25.2%).

Conclusions: Cannabis consumption, especially for symptom relief, was relatively common among those with endometriosis, with some people starting their consumption of cannabis due to health care restrictions that occurred due to the COVID-19 pandemic. Difficulties accessing cannabis and unpleasant/unwanted side effects were the most common reasons for lack of current cannabis consumption in those who had previously consumed it. Cannabis consumption may form an important part of endometriosis management especially when access to routine medical care is restricted.

Keywords: cannabis; endometriosis; COVID-19; legal; management; access

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Introduction

Endometriosis is a chronic inflammatory disease process characterized by the presence of endometrial-like tissue outside the uterus.¹ It affects ~10% of reproductive-age women worldwide.^{2,3} Persistent pelvic pain, dysmenorrhea, dyspareunia, and dyschezia remain hallmarks of disease.^{4–6} Negative impacts on overall health and well-being^{7,8} and productivity at work^{9–11} are common in those with endometriosis. It also commonly contributes to psychological distress that further exacerbates pain.¹²

The mechanism(s) by which endometriosis causes pain remain poorly understood,^{12–15} which may contribute to the significant challenges for pain management.¹⁶ Current mainstay medical management of endometriosis-related pain involves hormone therapy, nonsteroidal anti-inflammatory drugs and other analgesics such as opioids and neuroleptics.^{15,17–20} Surgical treatment of endometriosis may also be offered to reduce pain.^{21,22} However, not all endometriosis patients are suitable candidates for surgery and many experience symptoms refractory to medical or surgical treatment.^{23,24} This highlights the pressing need for alternative symptom-management options.

The COVID-19 global pandemic has caused many health resources to be re-directed toward pandemic efforts, resulting in a worldwide decrease in health care accessibility^{25,26} and many elective surgeries have also been delayed indefinitely.^{21,27} The impediment to accessing normal health care has limited endometriosis patients' ability to obtain their usual treatments, including those for pain relief.^{27–29}

While telehealth appointments did allow ongoing care of current patients there may have been issues in access for new patients due to lack of access to diagnostic procedures, and in the early pandemic period (May–June 2020), one in five people with endometriosis worldwide reported issues with access to their normal endometriosis medications, over a third cancelled or postponed procedures, and half cancelled or postponed gynecological appointments.³⁰

Pre-pandemic, there was already evidence supporting a worldwide increased adoption of self-management measures for control of endometriosis symptoms.^{8,31,32} This turn to self-treatment has likely increased since the onset of the pandemic.²² Cannabis is one of the self-management measures used by women with endometriosis with patient-reported efficacy in symptomatic relief.^{33–35}

Despite the pandemic-related general economic slowdown, supply of medicinal cannabis has remained unhampered, with stocks rising to meet increased demand.³⁶ There has been little reported difficulty worldwide in accessing legally prescribed cannabis, with dispensaries considered essential services and remaining open for business during the pandemic.³⁷ Therefore, it is possible that cannabis usage, whether medical, legal or illicit, may have formed an important part of self-management during the restrictions to standard medical care that occurred during the pandemic.

This study aims to investigate the patterns of cannabis use worldwide in self-management of endometriosis-related pain during the early COVID-19 pandemic and to explore if cannabis consumption had changed because of potential restrictions, barriers to health care, or health-related concerns. We also explored the impact of legality of access on usage and communication with health professionals, the common reasons and barriers of use during COVID, and to compare Health Related Quality of Life (HRQoL) of endometriosis patients who are cannabis users versus nonusers.

Methods

Sample and recruitment

This survey was approved by the Western Sydney University Human Research Ethics Committee, approval number H13823 (approved May 2020). This survey was hosted on the Qualtrics platform (Qualtrics Ltd.). The survey took ~15–30 min to complete. The survey was open for 8 weeks between mid-May 2020 till mid-July 2020.

People were eligible to participate if they had been told by their medical doctor that they had endometriosis and were aged between 18 and 55. No current or previous cannabis usage was required to participate.

Recruitment was conducted via the social media platforms of the largest endometriosis support and advocacy groups worldwide, including the World Endometriosis Organization, Centre for Endometriosis Research, Endometriosis Ireland, The Endometriosis Network Canada, Endometriosis NZ, Endometriosis Australia and Nancy's Nook. At the time of the survey there were ~95,000 combined followers of these groups on social media, with some followers being likely to be common between groups and others not having endometriosis, but rather being a family member or friend of an endometriosis patient. Features were enabled within Qualtrics that prevented multiple completions from either a single IP address

or the same computer to reduce duplicate entries. No direct contact occurred between respondents and the research team.

Survey development and design

The survey was designed by the research team including gynecologists and academics with expertise in the areas of cannabis, endometriosis, and menstrual health. Demographic information including age, location, endometriosis symptoms, diagnostic approach, and current management approaches was collected. Current or previous cannabis usage responses differed depending on whether the respondent was using cannabis before COVID-19 or had started more recently, and included amount/dosage, method of administration (e.g., oil, smoked, vaporized, capsules, suppository, etc.), changes in consumption, source(s), and recommendation(s) of cannabis usage (including health care professionals).

The Endometriosis Health Profile-30 (EHP-30) is a 30-item validated patient self-reported outcome that assesses HRQoL in people with endometriosis across 5 domains—pain, control and powerlessness, emotional wellbeing, social support, and self-image.^{38,39} The EHP-30 is one of the most commonly used endometriosis-specific HRQoL tools to explore symptom burden⁴⁰ and has been translated into more than nine languages. A higher score in EHP-30 domains indicate more severe symptoms and poorer HRQoL. The survey was pilot tested by lay people both with and without endometriosis, and modifications to wording and question flow were made based on their feedback. Supplementary File S1 includes a copy of the survey.

Data analysis

Data were analyzed using Prism 9 (GraphPad Software, San Diego, CA). Descriptive statistics were presented as mean and standard deviation (SD) for normally distributed data, and median and interquartile range (IQR) for non-normally distributed data. Number and percentages were provided for categorical data. Where there was a free response box attached to the “other” response for the symptoms and treatment questions the answers were categorized using a qualitative descriptive approach.⁴¹ Initial meaning units were condensed into codes by one author (P.D.). Codes with similar patterns were grouped into categories. This process and the subsequent categorization were discussed with the first author (M.A.).

Chi-square tests were performed to examine the association between legality of access and cannabis use, in

addition to legality of access and informing the primary health care provider (HCP) within the group that had admitted to cannabis use within the last 12 weeks.

Unpaired *t*-tests with Welch’s correction were used to compare EHP-30 scores between cannabis users and nonusers. A *p*-value of <0.05 was considered statistically significant. Missing data were not replaced.

Results

A total of 1677 responses were received with 43 responses excluded as the respondents did not have endometriosis, leaving 1634 valid responses. Table 1 displays the demographic data of survey respondents. The mean age of included respondents was 30.7 years (SD 7.1), with a median of 4 years (IQR 7) since diagnosis and mean age at diagnosis being 25 years (SD 6.8). The majority of respondents (82.2%) were diagnosed via laparoscopic surgery, with a preponderance of respondents residing in the United States of America (41.1%), Australia (18.7%), and New Zealand (16.2%). More than half of respondents had completed a high school, college degree, or a bachelor’s degree.

Fatigue was the most reported symptom at 92.1%, followed closely by dysmenorrhea (91.7%) and chronic pelvic pain (91.1%). Most respondents (87.8%) reported using heat therapy for symptomatic relief, with nonopioid pain relief the second most common treatment used (82.8%).

Use of cannabis in last 12 weeks

Eight hundred forty-six respondents (51%) reported using cannabis in the past 12 weeks, 455 (27.8%) respondents reported that they had never used cannabis, while 333 (20.4%) reported having used cannabis previously, but not in the last 12 weeks. Of the respondents that used cannabis in the last 12 weeks, 467 (55%) reported use for symptomatic management only, 26 (3%) used for recreational purposes only, and 353 (42%) used for both symptom relief and recreational purposes.

Three hundred respondents (35%) reported they were using cannabis in a country with no legal access. An association between legality of access and cannabis use in the last 12 weeks was identified, with those having legal accessing being more likely to use cannabis for any reason [χ^2 (1, *n* = 1634) = 88.39, *p* < 0.0001], see Table 2. There was an association between legality of access and the intent to inform their HCP about cannabis use [χ^2 (1, *n* = 1182) = 132.2, *p* < 0.0001], see Table 3. Those who had legal or medical access were much more likely to have told or have intend to tell their

Table 1. Demographics data

Characteristic	n (%)
Age in years, mean (SD)	30.7 (7.1)
Age at diagnosis, mean (SD)	25 (6.8)
Years since diagnosis, median (IQR)	4 (7)
	n (%)
Diagnosis method	
Surgery	1360 (82.2)
Ultrasound/MRI	124 (7.6)
Told by HCP based on symptoms	122 (7.5)
Other/unspecified/miscellaneous	28 (1.7)
Level of education	
Bachelor's degree	586 (35.9)
Completed high school/college/secondary education	380 (23.3)
Diploma/certificate	344 (21.0)
Master's degree	207 (12.7)
PhD or another professional doctorate	50 (3.1)
Did not finish high school/college/secondary education	65 (4.0)
Other/did not respond	2 (0.1)
Country	
United States of America	671 (41.1)
Australia	306 (18.7)
New Zealand	265 (16.2)
Canada	124 (7.6)
United Kingdom of Great Britain and Northern Ireland	120 (7.3)
All other countries < 10 respondents	94 (5.7)
Ireland	44 (2.7)
Denmark	10 (0.6)
Symptoms ^a	
Fatigue	1505 (92.1)
Dysmenorrhea	1498 (91.7)
Chronic pelvic pain	1488 (91.1)
Bowel symptoms	1415 (86.6)
Back pain	1362 (83.4)
Dyspareunia	1210 (74.1)
Anxiety or depression	1204 (73.7)
Difficulties with sleep	1107 (67.7)
Nausea	1107 (67.7)
Headache or migraine	1060 (64.9)
Heavy menstrual bleeding	1031 (63.1)
Bladder symptoms	977 (59.8)
Other	278 (17.0)
Leg pain/pins and needles in legs ^b	37 (2.3)
Chest/rib/shoulder pain ^b	36 (2.2)
Sciatica/shooting pains ^b	24 (1.5)
Bloating ^b	22 (1.3)
Hip pain	15 (0.9)
Painful ovulation ^b	15 (0.9)
Unspecified nerve pain ^b	14 (0.9)
Difficulty conceiving ^b	12 (0.7)
Fibromyalgia, aching muscles/body ^b	9 (0.6)
Numbness ^b	5 (0.3)
Miscellaneous ^b	84 (5.1)
Treatments used	
Heat therapy	1434 (87.8)
Nonopioid pain relief	1354 (82.8)
Hormonal treatment	909 (55.6)
Low intensity aerobic exercise	831 (50.9)
Opioid-based pain relief	676 (41.3)
Yoga	569 (34.8)
Physiotherapy/pelvic exercises	553 (33.8)
Psychological treatment	540 (33.0)
Moderate to high intensity aerobic exercise	266 (16.2)
Herbal medicines (not including Cannabis)	252 (15.4)

(continued)

Table 1. Continued

Characteristic	n (%)
Acupuncture	233 (14.3)
Neuroleptics	201 (12.3)
Other	174 (10.6)
Dietary changes/supplements ^b	44 (2.69)
TENS/electrotherapies ^b	31 (1.9)
Massage ^b	26 (1.6)
Alternative medicines (nonherbal) ^b	25 (1.5)
Antidepressants ^b	13 (0.8)
Ice ^b	10 (0.6)
Miscellaneous ^{b,c}	34 (2.1)

n = 1634 for all except "age at diagnosis" where *n* = 1614.

^aOption to select multiple answers was allowed leading to a total number of responses greater than 1634 and %*n* > 100%.

^bCategories derived from common responses in free text box attached to "other" response option.

^cGrouped responses from free text box attached to "other" response option that did not fit into existing category.

HCP, health care provider; IQR, interquartile range; SD, standard deviation.

HCP about their usage compared to those with no legal access. Common reasons given for not wanting to tell their HCP were legality (30.5%), and concerns about their doctor's attitude toward cannabis (24.2%).

Before COVID the majority of respondents used cannabis at least once per day (61.2%) or at least once per week (24.7%). The most common methods (used 50% of the time or more) of consuming cannabis before COVID were via smoking a joint (24.4%), using a pipe or bong (both 13.6%), consuming an oil (12.6%), or eating an edible (12.4%). Both topical (5.6%) and suppositories (2.1%) were the least common methods. Just under a third (28%) of respondents reported at least one side effect from cannabis. Of those reporting side effects 75% reported feelings of euphoria, 72% increased appetite, 67% dry mouth, and 35% feelings of mild anxiety or paranoia. Medically diagnosed cannabis hyperemesis syndrome was reported by two respondents (< 1%).

Changes to patterns of cannabis use and expenditure since the beginning of the COVID-19 pandemic

Seven hundred seventy-six respondents were able to compare their cannabis use pre-COVID-19 pandemic to current usage during the pandemic, with the majority reporting either reporting no change (32.2%) or increased use (56.9%). Twenty-three percent reported that their methods of cannabis consumption had changed during the pandemic. The most common changes were a reduction in inhaled methods of

Table 2. Association between legal purchasing status of cannabis in home country and participant cannabis use in the last 12 weeks, n=1634

Legal purchasing status	Cannabis use in last 12 weeks, n (%)				
	Never used	Not in last 12 weeks	For symptom management only	Recreationally only	Both for symptom relief and recreationally
Not legal	210 (32.8)	131 (20.4)	154 (24)	10 (1.6)	136 (21.2)
Partially legal	32 (21.9)	38 (26)	36 (24.7)	2 (1.4)	38 (26)
Medical access only	122 (31)	96 (24.4)	107 (27.2)	3 (0.8)	65 (16.5)
Legal	80 (18.2)	66 (15)	169 (38.4)	11 (2.5)	114 (25.9)
Unspecified	11 (78.6)	2 (14.3)	1 (7.1)	0 (0)	0 (0)

consumption (39.5%) and increased consumption of edibles (40%) or oil (25.2%). The most common reasons for these changes were due to concerns for their respiratory health (47.7%) or changes in product availability (37.6%).

Seven hundred seventy-four respondents were able to compare cannabis expenditure pre-COVID-19 pandemic to pandemic times, with the majority either spending around the same amount (44.8%) or increased spending (43.7%).

Table 4 shows reasons given by respondents for not using cannabis in the last 12 weeks with the most common being access difficulties. This included legal concerns and employment concerns such as random drug screening at work. Table 4 also shows the distribution of reasons why respondents started using cannabis during the COVID-19 pandemic.

EHP-30 scores

Fifteen hundred ninety-one (97.4%) complete responses were received for the EHP-30 questionnaire. EHP-30 scores were significantly higher in all categories among cannabis users compared to nonusers, indi-

cating worse symptomatology and poorer quality of life. Table 5 depicts the mean and SD of EHP-30 scores overall, along with the group that had used cannabis in the last 12 weeks and the group that had not used cannabis in the last 12 weeks.

Discussion

This international cross-sectional survey investigated patterns of cannabis use in the management of endometriosis-related symptoms, and the impact of the COVID-19 pandemic on patterns of use. Use of cannabis for symptom relief was common, with over half of respondents having used cannabis for symptom management in the 12 weeks preceding survey completion. Countries with legal access showed a greater proportion of those consuming cannabis for symptom management than those that did not have legal access pathways. The majority of pre-existing cannabis consumers were

Table 3. Association between legal purchasing status of cannabis and intent to tell health care provider about cannabis use, n=1634

Intent to tell HCP about cannabis use	Legal purchasing status, n (%)				
	Not legal	Partially legal	Medical access only	Legal	Not specified
No intent	221 (51.9)	47 (11.0)	87 (20.4)	69 (16.2)	2 (0.5)
Future intent	83 (37.9)	23 (10.5)	57 (26)	56 (25.6)	0 (0)
Already told (cannabis was own idea)	114 (26.1)	37 (8.5)	98 (22.4)	188 (27.0)	0 (0)
Already told (cannabis was HCPs idea)	20 (20.0)	6 (6.0)	29 (29.0)	44 (44.0)	1 (1.0)

Table 4. Reasons for not using cannabis in the last 12 weeks and reasons for starting cannabis after the start of the COVID-19 pandemic (mid-March 2020)

	n (%)
Reasons for not using cannabis in the last 12 weeks, n=333	
Access difficulties (including legal/employment concerns)	215 (64.6)
Unpleasant experience/side effects	76 (22.8)
Cost	50 (15.0)
Other/miscellaneous	44 (13.2)
Not effective	38 (11.4)
Pregnant/breastfeeding ^a	17 (5.1)
Health concerns ^a	10 (3.0)
Social stigma ^a	5 (1.5)
Reasons for starting cannabis after the start of the COVID-19 pandemic, n=70	
Increased stress/anxiety/symptoms during COVID-19 pandemic	41 (58.6)
Lack of access to normal medical care	33 (47.1)
Delayed/cancelled surgery	28 (40.0)
Lack of access to medications	17 (24.3)
Planned to start before COVID-19 pandemic	14 (20.0)
Other/miscellaneous	11 (15.7)

^aCategories derived from free text response box for "other" responses.

Table 5. Comparison of Endometriosis Health Profile-30 scores between respondents that have used cannabis in the last 12 weeks and those that have not

	Overall (<i>n</i> =1591), mean (SD)	Cannabis use (<i>n</i> =831), mean (SD)	No cannabis (<i>n</i> =760), mean (SD)	<i>p</i> ^a
Pain	65.2 (16.6)	68.1 (15.3)	62.0 (17.4)	<0.0001
Control and powerlessness	75.3 (19.8)	77.4 (18.9)	73.0 (20.6)	<0.0001
Emotional wellbeing	54.7 (18.1)	56.6 (17.2)	52.7 (18.8)	<0.0001
Social support	66.6 (21.2)	68.2 (20.9)	64.9 (21.4)	0.0019
Self-image	68.0 (23.5)	70.3 (22.0)	65.5 (24.8)	<0.0001

^a*p*-Values from unpaired *t*-tests with Welch's correction.

using inhaled forms of cannabis on a daily basis, and reported an increase in their cannabis consumption after the onset of the pandemic.

A substantial minority reported moving from inhaled forms of cannabis to edible forms, most commonly for concerns regarding their respiratory health. Common reasons for starting cannabis consumption during the pandemic were lack of access to normal medical care, increased stress and anxiety, and delayed surgery. Our study found that those who had legal access pathways for cannabis consumption in their country were more likely to have discussed their cannabis consumption with their health professional compared to countries with no legal access. We also found that access difficulties, including legal concerns as the biggest barrier to cannabis consumption, further supporting the notion of a role of legality in influencing the ability to use cannabis medicinally.

Cannabis is often perceived as an illicit, recreational drug associated with negative social stigma and legal consequences.^{35,42,43} Fear of legal consequences or social stigma may prevent an individual from using cannabis and from disclosing their use to their HCP, regardless of reason for use.⁴³ Our study findings are consistent with literature demonstrating an association between legality and cannabis use and disclosure,⁴³ and reflect previous data that show that rates of cannabis use are higher in states with liberal cannabis access, compared to states that have not legalized cannabis access.^{44,45}

Liberalization of cannabis laws (legalizing adult recreational and/or medical use) would likely assist with shifting public perceptions of cannabis being seen purely as an illicit drug, thereby contributing to reduction in social stigma and likelihood of negative consequences and barriers to use.^{46–48} This, in turn, may also encourage users to disclose medicinal or recreational use to their HCP.^{46–48}

Our study found that the most frequently reported reasons to start using cannabis post the onset of the pandemic were heightened anxiety and stress levels, a subjective amplification of endometriosis symptoms, and a lack of access to medical care including cancelled or delayed appointments, surgeries, and restricted access to regular medications. This can be attributed to a shift in health care resource allocation during the pandemic, affecting the management of endometriosis patients worldwide.^{22,29,49} Reduced access to regular health care and indefinitely delayed surgical treatment resulted in emotional distress and inconsistent endometriosis treatments, leading to increased numbers of women turning to self-management as a coping strategy.^{34,41}

Despite increases in cannabis consumption during the pandemic, cannabis-related expenditure did not increase to the same extent. This may reflect that cannabis sales are recession resistant,⁵⁰ with an ongoing supply continuing to meet increased demand during the pandemic without substantial cost rise.^{34,51} This supports the potential for cannabis to fill a gap in endometriosis care further exposed during the pandemic but will likely continue to exist considering the inadequacies of current medical and surgical treatments.

Access difficulties, including legal and employment concerns, were found to be the main reason respondents refrained from consuming cannabis. While there have been shifting trends regarding cannabis laws, with several countries including Canada, parts of the United States, The Netherlands, and Australia already fully or partially legalizing cannabis access,^{52–55} legal reform worldwide under the auspices of the International Drug Control Conventions can at best be described as piecemeal and inconsistent. In countries such as Australia, where legislation was passed in 2016 for use of cannabis for limited medical purposes,⁵⁶ Special Access Scheme records indicate only the sporadic prescribing of cannabis for endometriosis.³²

In addition, while cannabidiol preparations are available in some countries without a prescription, or even over the counter, this was not the case at the time of the survey for many countries, including Australia and New Zealand.⁵⁷

Given the high rate of illicit usage reported, it is unclear which of the various chemovars were used by respondents but it is likely that most illicit cannabis is likely to have a significant tetrahydrocannabinol (THC) content, which is an important contributor to the analgesic effect in endometriosis-related pelvic pain.⁵⁸ Cannabis is, however, postulated as an effective

self-management treatment for endometriosis symptomology,³⁵ further supported by evidence showing the role the endocannabinoid system plays in maintenance and recurrence of chronic noncancer pain associated with endometriosis.¹⁷ Yet, despite it being a potential viable analgesic for endometriosis-related pain, legal concerns inhibit patients from considering use (including roadside THC drug driving detection and licensing risks inherent in laws that often do not account for medically prescribed source, dose, time/method of consumption, nor actual level of impairment that can result in convictions, fines and loss of ability to drive vehicles).

Cost was a barrier to cannabis consumption. Cannabis price depends on the type, amount of cannabinoid content, and shipping and pharmacy charges.⁵⁹ Additionally, discrepancies in policies and regulations between countries lead to the differences in costs of obtaining cannabis worldwide, irrespective of legal accessibility.⁶⁰ On average, patients spend approximately \$384 monthly (AUD\$12.80/day) on obtaining legal cannabis in Australia,⁶¹ compared with \$208/month in the United States and \$200/month in Canada.³⁵

Additional to the product cost, the expenses associated with obtaining an authorized prescription should also be considered, which will be similarly impacted by regional factors. Endometriosis being an incurable disease⁶² patients face an ongoing cost for treatments to manage symptoms and to maintain HRQoL.⁶³ Lack of public (Medicare-like) insurance reimbursement and limited private health insurance coverage push the out-of-pocket costs associated with cannabis medicines onto patient households, a burden not every patient/family can bear, regardless of its reported effectiveness in the management of endometriosis.⁹ As a result, the expense of cannabis is a barrier to women considering it as a management option.

Our study found a statistically significant difference in HRQoL between the cannabis-using group and nonusers. However, clinical minimally important differences for the EHP-30 questionnaire for different domains range from 9.5 in the social support domain to 33.7 in the pain domain to 45.2 in the control and powerlessness domain, which suggests that these small differences between groups, for example, 6.1 for the pain domain, are very unlikely to be clinically significant.³⁹

There are several strengths to this study including the large sample size and the international dissemination of the survey allowed for greater subject variability, increasing the power and generalizability of the

data.⁶⁴ The anonymous nature of the survey also encourages participant willingness to disclose sensitive information.⁶⁵

Conversely, as a cross-sectional study with collection of data via questionnaire there are a number of limitations. Due to the anonymous nature of the survey, no proof of diagnosis could be gathered. Over 80% of respondents indicated a laparoscopic diagnosis, and self-report of these diagnosis tends to be accurate in majority of cases,⁶⁶ however, it is possible that some respondents had other forms of pelvic pain rather than endometriosis. Dissemination of the survey via social media may have incurred a non-response selection bias where characteristics of those reached by the social media platform, but chose not to complete the survey, differ from respondents.⁶⁷

There may also be recall bias;⁶⁸ however, by limiting most of the questions to those who had consumed cannabis in the past 12 weeks we expect this to be minimal. Obtaining reliable and accurate information specific to the types of cannabis chemovars being used by survey respondents is difficult, especially due to the common usage of illicit cannabis in many countries such as New Zealand and Australia^{34,35} preventing accurate data collection of the varying amounts of cannabinoids used in this study. Finally, while differences in HRQoL between groups were found, causality cannot be determined due to the single time point recorded, therefore it is impossible to say if, for example, pain and a lack of feeling control over symptoms led to the choice of cannabis consumption.

Conclusions

Our study found that cannabis consumption, especially for symptom relief, was relatively common among those with endometriosis, with some people starting their consumption of cannabis due to health care restrictions that occurred due to the COVID-19 pandemic. Over half of those who already consumed cannabis increased their usage during the pandemic, but cannabis expenditure did not show the same increase. Difficulties accessing cannabis was the most common reason for lack of current cannabis consumption in those who had previously consumed it. Legal access was associated both with a greater likelihood of using cannabis and greater disclosure to health care professionals.

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Supplementary Material

Supplementary File S1

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Abbreviations Used

EHP-30 = Endometriosis Health Profile-30
HCP = health care provider
HRQoL = Health Related Quality of Life
IQR = interquartile range
SD = standard deviation
THC = tetrahydrocannabinol