

Post-legalization Consumption of Cannabis at Massachusetts General Hospital Dental Group

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ABSTRACT

Aim: The aim of this study was to evaluate the profile of patients undergoing dental treatment in relation to cannabis use.

Materials and methods: A comprehensive questionnaire was used to address the type of cannabis preparations, route of intake, frequency of usage, and potential reasoning for use (recreational vs medical use) of patients from the MGH Dental Group.

Results: Seventy-six adult patients completed the survey. Sixty-one percent of the participants were female, with the majority (59%) of the participants being ≥ 51 years or older. Twelve of the 76 participants (16%) were 18–30 years old. The remaining 19 patients (25%) who participated in the study were 31–50 years old. The sample included participants who were predominately non-Hispanic (63 patients, 83%) and White (59 patients, 78%). The majority of patients either had their first use of cannabis prior to 18 years of age (36%) or did not respond to this question (34%) at all. The predominant age at consistent cannabis use was 18–30 years (13%). The most common method of cannabis intake in the preceding year for participants was smoking, followed by ingesting, using cannabidiol (CBD), and vaping (least common). Recreational cannabis use was reported in 47% of the participants vs 28% of participants who reported cannabis intake for medical use.

Conclusion: This preliminary study characterized the profile of patients undergoing dental treatment in relation to marijuana use. Diminishing restraints to cannabis use may affect the dental profession.

Clinical significance: It is important for dentists to understand cannabis-related oral health conditions to provide customized patient treatments.

Keywords: Cannabis, Dental care, Dental public health, Legalization, Questionnaire survey.

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INTRODUCTION

Cannabis is one of the most commonly used drugs in the world, ranking third after alcohol and tobacco use by adults ≥ 65 years old in the United States.¹ Cannabis can be used in several ways. The three most common forms of cannabis are marijuana, hashish, and hash oil. The least concentrated form, which is also the most common type of cannabis intake, is marijuana comprising 0.5–5% cannabinoid delta-9-tetrahydrocannabinol (THC). In terms of increased THC concentration, marijuana is followed by hashish (2–20% THC) and hash oil (15–50% THC), which is the most potent form.^{2,3} Hash oil can be either spread on a cigarette wrapping paper or on the cigarette end and smoked.³

The use of marijuana, which comes from the hemp plant *Cannabis sativa*, continues to increase worldwide as legal restraints diminish, and it is estimated that 43.5 million people aged ≥ 12 or older use marijuana in the United States.⁴ Marijuana contains over 100 cannabinoids and acts on the endocannabinoid system.⁵ The primary cannabinoid compounds include the psychoactive component of cannabis preparations—THC—and the nonpsychoactive constituent of cannabis—CBD.^{2,3,5} Both the compounds have been comprehensively studied for their applications in the medical field.⁵

The popular use of cannabis is important to understand due to its concerning effects on the general health of the public. This substance can affect most of the systems in the body and user's overall health. For instance, THC can lead to tachycardia, vasodilation, and respiratory issues such as bronchitis.³ Additionally, cannabis can affect the user's immune cell response due to its immunosuppressive effects.³ Cannabis abusers have been linked

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to poorer oral health and have demonstrated increased decayed, missing, and filled teeth scores; higher plaque scores; unhealthy gingiva; xerostomia; and oral lesions such as leukoplakia.^{3,6}

On the other hand, CBD is a nonpsychoactive constituent of *Cannabis sativa*.^{2,3,5–7} With reported relief from several conditions, especially pain, and without the intoxicating effects of marijuana, CBD oils have become increasingly common in use.⁶ These oils can provide therapeutic benefits without the “high” or other psychotropic effects of marijuana products, such as appetite stimulation, which can affect the oral cavity through increased intake of decay-causing foods.^{1–3,6,7}

While there is a thorough research pertaining to THC and CBD, there is a lack of epidemiologic information pertaining

to the impact of regular use of cannabis preparations on the oral cavity. To study the impact of cannabis on oral health we designed a study entitled “Post-legalization Consumption of Cannabis at MGH Dental Group: A Survey-based Study.” We used a comprehensive questionnaire addressing the type of cannabis preparation, route of intake, frequency of usage, and reason behind consumption in dental patients. The aim of this study was to evaluate the profile of patients undergoing dental treatment in relation to cannabis use.

MATERIALS AND METHODS

Design

This study was approved by the Institutional Review Board (IRB) at MGH (Protocol #:2020P000623). A12-question survey was available to all dental patients who received care at either MGH Dental Group in Boston or Danvers, MA. The survey was available from September 17, 2021 to April 30, 2022.

Procedures

The survey was available to all patients in the waiting area of both the MGH Dental Group locations. Participation involved the completion of one survey, which took approximately 5 minutes. The surveys were anonymously self-filled by the patients and placed in a locked, opaque box once completed. There was no compensation for the survey. Participation in this study was completely voluntary, and there was no personal benefit to the patients.

Sample

The 12-question survey was in English, and patients unable to understand or read English to provide voluntary consent by completing the survey were excluded from the study. The study locations treat pediatric and adult patients from within and outside Massachusetts, and also patients with private insurance, public insurance (Mass Health), but without dental insurance. Only adult survey responses were included in the review.

Measures

The respondents’ demographics were collected. The participants were grouped based on age: 18–30 years, 31–50 years, and ≥51 years. Gender, race, ethnicity, employment status, and dental anxiety were categorized for analysis. Gender was separated into three options: male, female, and nonbinary. Ethnicity was coded as Hispanic or non-Hispanic. Patients’ race was categorized into White, Black, American Indian/Alaska Native, Asian, Native Hawaiian, Pacific Islander, or other. Employment status was coded as student (college), student (advanced degree), employed (part-time), employed (full-time), or unemployed. Dental anxiety was dichotomized as Yes or No.

Cannabis Use during the Preceding Year

The questions regarding cannabis use and frequency in the survey focused on usage by patient during the preceding year. These questions asked about the age at the first use and age at regular use by the patient, as well as the patient’s frequency of usage of the following types of intake methods over the past years: smoking (marijuana plant product), vaping THC (e-vaporizer/pen), ingesting THC (capsules, baked products), and using CBD (tincture, capsules, and edibles). The questions addressed the rate of frequency of these products over the last year and the reason for their usage if a participant reported their use.

Data Analysis

Survey responses were voluntary, and answers could be left blank if the participants preferred not to respond. Even though some data were missing for certain questions, the entire questionnaire ($n = 76$) was included in the study. We present the data as percentages. The software Prism 7.0 (GraphPad) was used for the data analysis.

RESULTS

The survey was offered to all patients at the two location sites, irrespective of whether they used marijuana or CBD products or not. The study locations treat pediatric and adult patients from within and outside MGH; however, only adult survey responses were included in the review and in the result analyses. The demographics of the 76 adult patients who completed the survey from September 17, 2021 to April 30, 2022 are described as follows (Table 1). Sixty-one percent of the participants were female, with the majority (59%) of the participants being ≥51 years. Twelve of the 76 participants (16%) were between the ages of 18 and

Table 1: Demographic characteristics of the 76 adult patients

<i>Demographic characteristics</i>	<i>Overall age</i>
Number	76
<i>Age, Years</i>	<i>Percentage (%)</i>
18–30	12 (15.79)
31–50	19 (25.00)
≥51	45 (59.21)
<i>Sex (%)</i>	<i>Percentage (%)</i>
Male	29 (37.66)
Female	46 (60.52)
No response	1 (1.30)
<i>Ethnicity</i>	<i>Percentage (%)</i>
Hispanic	8 (10.52)
Non-Hispanic	63 (82.89)
No response	5 (6.58)
<i>Race (%)</i>	<i>Percentage (%)</i>
White	59 (77.63)
Black/AA	4 (5.26)
Asian	6 (7.89)
Other	5 (6.58)
No response	3 (3.95)
<i>Status (%)</i>	<i>Percentage (%)</i>
Student (college)	2 (2.63)
Student (advanced degree)	3 (3.95)
Employed (part-time)	6 (7.89)
Employed (full-time)	42 (55.26)
Unemployed	19 (25.00)
No response	4 (5.26)
<i>Dental anxiety</i>	<i>Percentage (%)</i>
Yes	23 (30.26)
No	49 (64.47)
No response	4 (5.26)

Table 2: The age at the first use and consistent usage of cannabis products

Age at usage	Overall age (%)
Age at the first use	
<18	27 (35.53)
18–30	19 (25.00)
31–50	3 (3.95)
>51	0 (0)
Never tried or no response	26 (34.21)
Age at consistent usage	
<18	9 (11.84)
18–30	10 (13.16)
31–50	3 (3.95)
>51	1 (1.32)
Never tried or no response	53 (69.74)

30-years-old. The remaining 19 dental patients (25%) who participated in the study were 31–50 years old. The sample included participants who were predominately non-Hispanic (63 patients, 83%). Fifty-nine participants responded as White (78%), while the remaining participants answered as follows: Black 5%, Asian 8%, and others 8%. In terms of occupation status, 55% of the participants were employed full-time, 25% were unemployed or retired, 8% were employed part-time, 7% were either undergraduate or advanced degree college students, and the remaining 5% of the participants did not answer this status question. Of the 76 patients, 49 (64%) reported of not having any dental anxiety (Table 1).

Participants answered questions addressing the age at the first use and age at consistent usage (Table 2). The majority of patients had their first use of cannabis prior to 18-years-old (36%). Twenty-one of the 76 adult patients have never tried cannabis products in their lifetime, and 5 patients did not respond to the questions addressing the age at the first use. These same five patients also did not respond to the question addressing the age at consistent usage. Of the five patients who did not respond to either of these questions, 100% answered the remaining questions regarding the product usage as “Never.” The 26 patients that reported of never using cannabis products or did not respond to the question about the age at the first use were included in all the remaining analyses. Of the participants that responded to consistently using cannabis products, the predominant age at consistent use was 18 to 30 years old (13%) (Table 2).

Figures 1 to 4 provide the frequency of use of cannabis products under the following categories: smoking (marijuana plant product), vaping THC (e-vaporizer/pen), ingesting THG (capsules, baked products), and using CBD (tincture, capsules, and edibles), respectively. The most common method of cannabis intake in the preceding year for participants was smoking, followed by ingesting, using CBD, and vaping (the least common) (Figs 1 to 4). In Figure 1, 33% of the 46 patients that responded to never smoking marijuana in the preceding year of the patients responded to previously using a marijuana product in their lifetime. Of the 64 patients that responded to never vaping THC, 59% of them responded to previously using a marijuana product in their lifetime (Fig. 2). Of the 55 patients that responded to never ingesting THC, 56% of them responded to previously using a marijuana product in their lifetime (Fig. 3). Of the 60 patients that responded never using CBD,

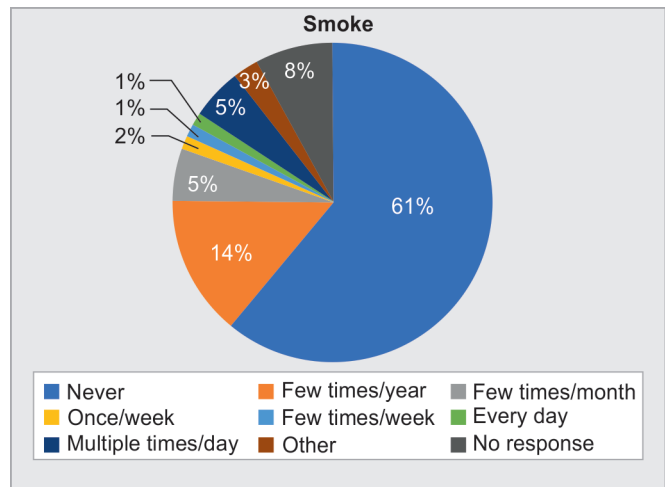


Fig. 1: Frequency of marijuana intake by smoking marijuana plant products (i.e., joint, bowl, blunt, etc.)

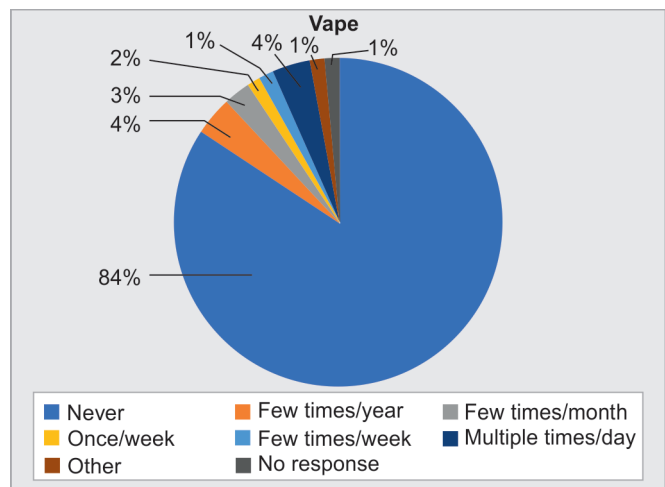


Fig. 2: Frequency of vaping delta-9-tetrahydrocannabinol (THC) (using an e-vaporizer or vague pen with oil, resin, shatter, budder, liquid, etc.)

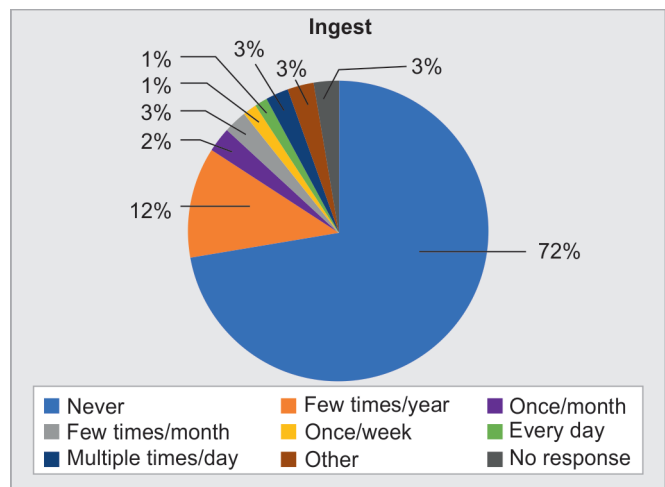


Fig. 3: Frequency of ingesting delta-9-tetrahydrocannabinol (THC) (capsules, tincture, liquids, edibles, baked products, etc.)



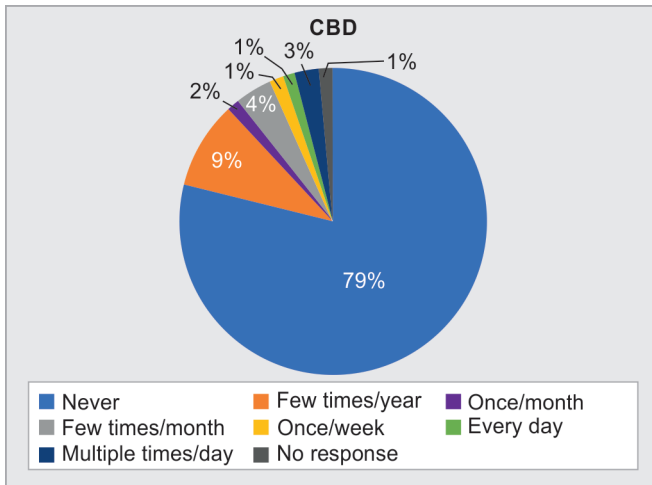


Fig. 4: Frequency of using CBD (capsules, tincture, edibles, joints, etc.)

57% of them responded to previously using a marijuana product in their lifetime (Fig. 4).

Additionally, patients were asked about their usage whether it was for managing symptoms of a medical condition or for recreation and enjoyment. Recreational cannabis use was reported in 47% of the participants (36 patients) vs 28% of the participants (21 patients) who reported cannabis intake for medical use. Thirty-five (46%) of the 76 patients responded to using a cannabis product in the preceding year. Thirteen of the patients (37%) that responded to the usage of any type of marijuana product in the preceding year did not specify whether the intake was for recreational or medical use.

Cannabis use during the preceding year was common in the adult patient population that was receiving dental care at MGH Dental Group. Almost half of the patients that participated in the study (46% of the patients) disclosed cannabis intake (smoke, vape, ingest, and CBD) during the preceding year, illustrating a habit that could impact patients’ oral and overall health.

DISCUSSION

This study analyzes the post-legalization of cannabis usage in the dental patient population receiving care at MGH Dental Group. This study utilized a comprehensive questionnaire to address the type of cannabis preparations, route of intake, frequency of usage, and the potential reasoning for its use (recreational vs medical use). The reasoning behind patients’ substance use was included in the study as an increasing number of states have been diminishing restraints regarding the cannabis use. As some states allow the purchase of cannabis from a dispensary for medical conditions approved for treatment, other states have legalized its recreational use.^{8,9} With changes in regulation, cannabis consumption has become a health concern.

While there has been recent research pertaining to THC and CBD, there is a limited evidence of the impact that regular use of cannabis has on the oral cavity. Most analyses of current cannabis use in patient populations have been based on surveys, public forums, and patient screenings. To further investigate and create an awareness of future areas of research regarding patient cannabis intake and the prevalence of cannabis use in patients receiving dental care, this survey was implemented.¹⁰

Cannabis use during the preceding year was common in the adult patient population that was receiving dental care at

MGH Dental Group. The survey results illustrate that 46% of the participants disclosed cannabis intake (smoke, vape, ingest, and CBD) during the preceding year. These findings are higher than the prior research that reports 10% of adults using it in the preceding month and 15.3% using cannabis during the prior year.¹¹ However, Boehnke et al.¹² report that there was a 35% increase in use during COVID-19 due to increased anxiety about the pandemic (68%), boredom (47%), and increased symptoms (42%). The higher frequency of cannabis use in the MGH Dental Group patient population could be related to the effects of COVID-19.

It is important to include questions regarding cannabis intake during an initial and periodic dental examination. Based on this survey, and possibly due to the anonymity, participants were willing to express their cannabis usage history. Although self-report bias is possible, dental patients may prefer to acknowledge their intake frequency (i.e., weekly, monthly) rather than answering Yes or No to cannabis usage. Additionally, having these questions incorporated within the medical history portion of examinations may help patients to illustrate that addressing this topic is a common practice during dental appointments.

In addition to cannabis usage, this questionnaire addressed potential anxiety in the dental setting. Dental anxiety can be observed in all the ages, with about 80% of adults feeling discomfort prior to treatment.¹³ As dental anxiety and fear are common in the population, patients may experience stress prior to appointments, which patients may aim to regulate through self-medication with cannabis products.¹⁴ The results of this study illustrate that 23 of the 76 patients (30%) responded Yes to experiencing dental anxiety, 27% of the participants reported using cannabis for medical use, and 47% of the patients reported using cannabis as a recreational activity. Although only 18 states in addition to the District of Columbia have legalized cannabis for recreational use in the adult population, cannabis intake for medical use is currently legal in 37 states in the US,¹⁰ including Massachusetts.

With the legalization of cannabis use, dental providers should continue to analyze the oral health effects. Abidi et al.¹⁵ mentioned that marijuana users exhibit increased decay, poor oral hygiene, and higher plaque index than nonmarijuana users. Therefore, it is important for dentists to implement additional preventative strategies to improve oral health in patients using cannabis products.

There are limitations to this study. The results are based on two dental clinics associated with MGH, and cannabis usage may vary outside these hospital-based dental practices. Five patients did not respond to the question about the age at the first use or the age at consistent usage. The lack of response could have been related to potential response bias due to the fear of judgment at an early age of substance use. However, as 100% of these patients then went on to answer the remaining product usage questions as “Never,” their nonresponse could be due to the fact that these patients did not find these questions applicable, and that these five patients are part of the sample that consists of nonusers. Although participants were aware that their responses were confidential, and would have no impact on their treatment and research, and supports the reliability and accuracy of self-reports, there is still the potential for response bias.¹⁶⁻¹⁸ In the future, if these questions were incorporated into the medical history, the patients’ responses may be affected based on provider–patient relationships. The future studies should continue to look at the age of use and the burden on oral health.

CONCLUSION

In conclusion, this preliminary study characterized the profile of patients undergoing dental treatment in relation to marijuana use. Current literature illustrates that cannabis abuse is associated with increased oral health concerns; however, additional research on usage, frequency, and mechanism of action of its effects is important to help understand potential oral health concerns. Diminishing restraints to cannabis use may affect the dental profession. It is important for dentists to understand cannabis-related oral health conditions to provide individualized patient treatments.

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