

Patient Perceptions on the Efficacy and Safety of Cannabidiol Products and the Role of the Pharmacist: A Cross-Sectional Study

Frank Nguyen, PharmD, Pomona, California

Seulji Chang, PharmD, Pomona, California

Pam Tarlow, PharmD, Santa Monica, California

Swathi Varanasi, PharmD, Chief Scientific Officer at Elément Apothēc, Los Angeles, California

ABSTRACT

OBJECTIVE: The aims of the study were to evaluate patient perceptions on the efficacy and safety of cannabidiol (CBD) products, to identify potential safety issues of concurrent use of CBD with other medications, and to determine whether patients discuss CBD use with their pharmacist.

METHODS: A cross-sectional study design and an anonymous survey were used to assess participants' reasons for seeking CBD, unwanted side effects of CBD, current medication lists, perceptions of CBD efficacy/safety, and whether participants discussed CBD products and/or CBD use with their health care professional or pharmacist. The survey was administered at Santa Monica Homeopathic Pharmacy in the Los Angeles metropolitan area from February 10 through March 13, 2020. Twenty-nine participants were recruited; all participants met inclusion criteria and were included in the data analysis. Statistics were completed using frequencies, means, and simple percentage analysis.

RESULTS: Among participants (N=29), more than half reported taking CBD (n=16, 55.2%); the vast majority of users (n=15, 93.8%) reported that CBD relieved their symptoms. Approximately two-thirds of the participants taking CBD (n=11, 68.8%) noted concurrent use of prescription medications, including antidepressants, benzodiazepines, insulin, opioids, and statins. Half (n=8) reported alcohol consumption. The number of participants who felt CBD was "generally safe" (n=25, 86.2%) was higher than those who believed "CBD may help their condition" (n=21, 72.4%). Only 6.3% of users (n=1) discussed their use of CBD with a pharmacist.

CONCLUSION: Although CBD products are generally recognized as effective and safe, potential safety concerns exist that may go unaddressed. This study demonstrates that pharmacists, who are one of the most accessible health care professionals, can serve as a valuable resource to patients regarding the safe use of CBD products.

Introduction

In recent years, there has been an increase in the discourse surrounding cannabidiol (CBD) products. Current studies have shown that CBD can ameliorate symptoms such as pain and anxiety; however, the data are limited. CBD

products are generally perceived by patients to be effective and safe, with few adverse effects.^{1,2} The general public, however, may not be aware of potential drug–drug interactions (DDIs) associated with CBD, or of other safety issues, such as abruptly stopping anti-anxiety medications to use CBD products. Due to the lack of information and stigma surrounding products derived from cannabis, pharmacists may overlook or be unaware of potential safety factors. As

Drs. Nguyen, Chang, Tarlow, and Varanasi have no financial conflicts of interest to disclose.

Role of the Pharmacist

continued from page 19

medication experts, it is incumbent on pharmacists to be familiar with the pharmacokinetics and pharmacodynamics of CBD. This knowledge, however, requires additional education as the endocannabinoid system and study of cannabis are not a core part of the curriculum for most doctor of pharmacy programs.³ According to a recent study surveying health care professionals (HCPs) across various specialties, 90% of HCPs said patients mentioned or asked them questions about CBD in the past month.⁴ Therefore, pharmacists could serve as a valuable educational resource on the therapeutic potential and safety of CBD for patients and HCPs.

Methods

Study participants were customers recruited from the Santa Monica Homeopathic Pharmacy (SMHP) in the Los Angeles metropolitan area using the following inclusion criteria:

- Adult men and women ≥ 18 years of age residing in California
- Current, previous, or potential CBD use

This study excluded participants < 18 years of age.

A cross-sectional study was approved by the Western University of Health Sciences Institutional Review Board, Pomona, California. Twenty-nine participants were recruited from a homeopathic pharmacy to complete an anonymous survey designed to assess their reasons for seeking CBD, and collect information on unwanted side effects, current medications, perceptions of CBD efficacy and safety, and discussions about CBD products or use with their HCP or pharmacist. All recruited participants met inclusion criteria and were included in the study, completing the informed consent process. Surveys were conducted in-person in the pharmacy and online through SMHP via the Google Forms online platform between February 10, 2020 and March 13, 2020. Statistics were reported with frequencies, means, and simple percentage analysis.

Results

Participants most often reported taking CBD for pain management ($n=12$, 42%), sleep issues ($n=7$, 26%), anxiety ($n=6$, 24%), and other conditions ($n=2$, 8%) such as appetite stimulation and relaxation. (Figure 1). Among CBD users ($n=16$), the vast majority ($n=15$, 93.8%) noted that CBD provided relief of their symptoms, particularly pain, anxiety, insomnia, and poor appetite. More than two-thirds of participants taking CBD ($n=11$, 68.8%) reported concurrent use of prescription medications, such as antidepressants, antivirals, benzodiazepines, dietary supplements, hormone therapy, insulin, opioids, statins, thyroid medications, and various dietary supplements.

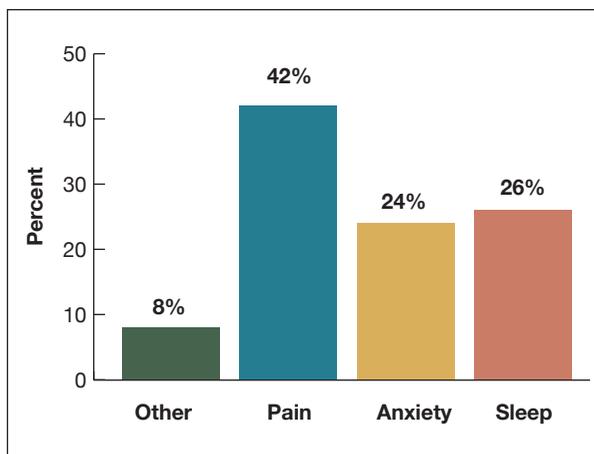


FIGURE 1. Reasons cited for seeking cannabidiol products.

Certain participants using concurrent prescription medications and CBD wanted to stop their prescription medications abruptly; however, this can cause withdrawal symptoms. For instance, one female participant said she wished to discontinue lorazepam abruptly and use CBD to manage her anxiety. Another participant was using opioid pain medications such as hydrocodone and wanted to taper down to avoid excessive central nervous system depression, and use CBD as an alternative.

Reported side effects of CBD included drowsiness ($n=3$, 18.8%), nausea and vomiting ($n=1$, 6.3%), and chest pain ($n=1$, 6.3%). One female participant reported using CBD edibles for sleep and experienced occasional drowsiness in the morning due to the lack of a standard dosing regimen and to the compelling dosage form, a chocolate bar. Another female participant experienced chest pain when she used a vaping form of CBD to control her pain. One male participant reported side effects of nausea and vomiting, but also indicated using a delta-9-tetrahydrocannabinol (THC) and CBD combination product, which may have contributed to the unwanted effects. Participants described taking a variety of CBD formulations and routes, including topical creams, capsules, gummies/food, tincture/oils, and smoking/vaporizing. Overall, 13.8% of study participants (users and non-users [$n=4$]) reported discussing CBD products with a pharmacist; however, only 6.3% of those taking CBD ($n=1$) reported discussing their use of CBD with a pharmacist (Figure 2). The number of participants who felt that CBD was “generally safe” was higher than those who thought “CBD may help their condition” ($n=25$, 86.2% vs $n=21$, 72.4%). More than half of the 29 participants ($n=19$, 65.5%) indicated that they *strongly agree* or *agree* that CBD products could improve their quality of life (Figure 3).

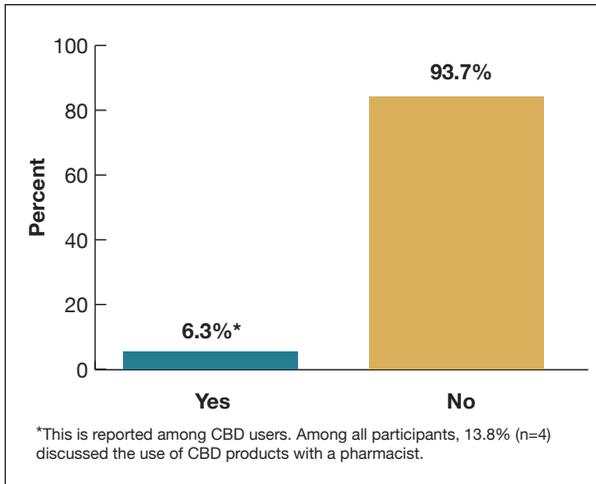


FIGURE 2. Discussions with pharmacist.
CBD, cannabidiol.

Some comments about hesitancy discussing CBD use with their pharmacist included “fear of being categorized as a drug user,” and concern that there is “no standard dosing information available.”

Conclusion

The majority of study participants reported that they found CBD to be both safe and efficacious for a range of conditions. Consistent with published clinical trials and

observational studies, the most commonly reported side effects of CBD were drowsiness or somnolence.^{5,6} The reasons participants provided for seeking CBD (pain, sleep, and anxiety) support published studies.^{7,8} For example, an anonymous survey study (N=2409) also demonstrated that pain, anxiety, and sleep were 3 of the top 5 medical conditions for which CBD was effective.⁹

Regarding participant characteristics (Table), this study had a higher number of female than male participants, which supports previous findings demonstrating a greater number of reported use among women than men.^{10,11} It is postulated that the reason for this is because women are more likely to report pain and anxiety—2 of the most commonly cited reasons for seeking CBD.^{10,11}

The percentage per ethnicity represented in this study was diverse, most likely in part due to the ethnic diversity in California¹²; however, this was a small sample size and may not be representative of the true diversity among CBD users. This study calls for future observational studies evaluating the perceptions and use of CBD across ethnicities and races.

Many of the comments received from the participants related to the stigma of CBD use. As an example, 1 participant responded that they are hesitant to discuss CBD with their pharmacist “for fear of being categorized as a drug user.” Fear of this stereotype could be one of the leading reasons why patients do not feel comfortable speaking with their pharmacist about CBD. Additionally, some

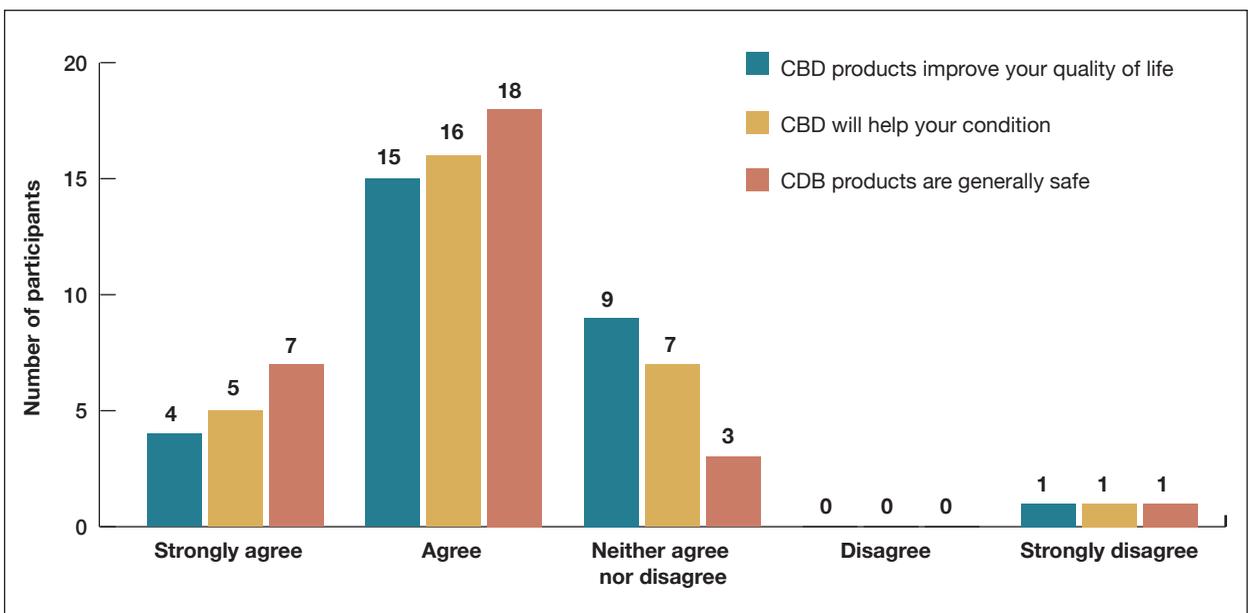


FIGURE 3. Participant perceptions of cannabidiol.
CBD, cannabidiol.

Role of the Pharmacist

continued from page 21

TABLE. Characteristics of Study Participants

	Participants (n)	Participants using cannabidiol (n)
Sample size	29*	16
Average age (y)	49	59
Sex, n (%)		
- Men	11 (37.9)	6 (37.5)
- Women	18 (62.1)	10 (62.5)
Ethnicity, n (%)		
- Black	3 (10.3)	2 (12.5)
- Asian/Pacific Islander	10 (34.5)	4 (25)
- White	15 (51.7)	9 (56.3)
- Mixed	1 (3.4)	1 (6.3)
Alcohol use, n (%)		
- Yes	18 (62.1)	8 (50)
- No	11 (37.9)	8 (50)
Concurrent medication use, n (%)		
- Yes	21 (72.4)	11 (68.8)
- No	8 (27.6)	5 (31.2)

*All participants (N=29) were included in the data analysis.

participants commented on their desire for standardized dosing of CBD, which is echoed in the medical community as a limitation of the current nonprescription CBD products on the market.¹³

In terms of DDIs, there are limited data related to CBD. CBD is primarily metabolized by cytochrome P450 (CYP) 3A4 (CYP3A4) and CYP2C19,¹⁴ and is well known as a CYP3A4 inhibitor and a CNS depressant.^{5,15} Theoretical DDIs have been identified; for example, through inhibition of CYP3A4, CBD may increase the risk for drug toxicity for CYP3A4 substrates, such as atorvastatin and opioids when taken together. CBD also may have additive sedative effects when taken with alcohol, antidepressants, benzodiazepines, or opioids. Some of the participants in the study were seeking CBD to help them taper off medications such as benzodiazepines and opioids (of course, medical supervision is recommended when initiating and proceeding with this treatment goal).

Limitations of this study were categorized as the following:

- Small sample size
- Customer demographic and mindset of the Los Angeles-area customer base
- Multiple routes of administration (cream vs smoking vs capsule)
- Uncontrolled quality and quantity of CBD products

- Various durations of use of CBD among participants (1 time use to 2 years)
- Use of combination THC/CBD products

Results of this study warrant further observational studies evaluating patient perceptions of CBD and cannabis products. Findings from future studies may inform targeted educational interventions to dismantle the beliefs and stigmas surrounding CBD that prevent patients from discussing it as a potential treatment option with their pharmacist. As pharmacists are the most accessible HCPs in the United States, it is imperative that they educate patients on the use of CBD products. Further studies demonstrating the importance of HCPs, particularly pharmacists, are needed to promote the importance of the practitioner–patient relationship in health outcomes. Through patient-centered, shared decision making, HCPs and patients can work collaboratively to achieve treatment goals. The dichotomy between the surge in patient interest in CBD and the lack of health care education in the United States is staggering, indicating that most pharmacists are poorly equipped to answer patients' questions related to CBD. This study, along with previous studies, advocates for the mandatory inclusion of cannabinoid science and pharmacology in all HCP curricula.^{3,13,16} With the overwhelming number of participants in this study who perceive CBD as safe and efficacious, accompanied by

the unrelenting increase in questions they have regarding its use, pharmacists play an essential role in patient education to ensure appropriate care and optimal outcomes.

References

1. World Health Organization. Expert Committee on Drug Dependence. Cannabidiol (CBD) Pre-Review Report Agenda Item 5.2; 2017. Accessed August 28, 2020. https://www.who.int/medicines/access/controlled-substances/5.2_CBD.pdf
2. Iffland K, Grotenhermen F. An update on safety and side effects of cannabidiol: a review of clinical data and relevant animal studies. *Cannabis Cannabinoid Res.* 2017;2(1):139-154.
3. Caligiuri FJ, Ulrich EE, Welter KJ. Pharmacy student knowledge, confidence and attitudes toward medical cannabis and curricular coverage. *Am J Pharm Educ.* 2018;82(5):6296.
4. Greenhalgh T. We surveyed HCPs about CBD: here's what we learned. *Clin Advisor.* September 17, 2019. Accessed July 18, 2020. <https://www.clinicaladvisor.com/home/topics/practice-management-information-center/we-surveyed-hcps-about-cbd-heres-what-we-learned>
5. Epidiolex. Package insert. Greenwich Biosciences; 2020.
6. Devinsky O, Cross JH, Laux L, Marsh E, Miller I, Nabbut R, Scheffer IE, Thiele EA, Wright S. Cannabidiol in Dravet Syndrome Study Group. Trial of cannabidiol for drug-resistant seizures in the Dravet syndrome. *N Engl J Med.* 2017;376:2011-2020.
7. National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Board on Population Health and Public Health Practice; Committee on the Health Effects of Marijuana: An Evidence Review and Research Agenda. *The health effects of cannabis and cannabinoids: the current state of evidence and recommendations for research.* Washington DC: National Academies Press; 2017.
8. Shannon S, Lewis N, Lee H, Hughes S. Cannabidiol in anxiety and sleep: a large case series. *Perm J.* 2019;23:18-041.
9. Corroon J, Phillips JA. A cross-sectional study of cannabidiol users. *Cannabis Cannabinoid Res.* 2018;3(1):152-161.
10. Pieretti S, Di Giannauro A, Giovannandrea R, et al. Gender differences in pain and its relief. *Ann Ist Super Sanita.* 2016;52(2):184-189.
11. McLean CP, Asnaani A, Litz BT, Hofmann SG. Gender differences in anxiety disorders: prevalence, course of illness, comorbidity and burden of illness. *J Psychiatr Res.* 2011;45(8):1027-1035.
12. QuickFacts: California. US Census Bureau; 2019. Accessed July 18, 2020. <https://www.census.gov/quickfacts/fact/table/CA/INC110218>
13. Federation of State Medical Boards. Model guidelines for the recommendation of marijuana in patient care: report of the FSMB Workgroup on Marijuana and Medical Regulation. 2016. Accessed May 12, 2020. <https://www.fsmb.org/siteassets/advocacy/policies/model-guidelines-for-the-recommendation-of-marijuana-in-patient-care.pdf>
14. Jiang R, Yamaori S, Takeda S, Yamamoto I, Watanabe K. Identification of cytochrome P450 enzymes responsible for metabolism of cannabidiol by human liver microsomes. *Life Sci.* 2011;89(5-6):165-170.
15. Alsherbiny MA, Li CG. Medicinal cannabis—potential drug interactions. *Medicines (Basel).* 2018;6(1):3.
16. Evanoff AB, Quan T, Dufault C, Awad M, Bierut LJ. Physicians-in-training are not prepared to prescribe medical marijuana. *Drug Alcohol Depend.* 2017;180:151-155.

Call for Submissions

AJEM invites researchers to submit articles for publication in all areas of cannabis medicine. We are currently accepting original manuscript submissions including:

- Case reports
- Surveys
- Clinical trials
- Review articles
- Letters to the editor

For author guidelines, please visit www.ajendomed.com

Manuscripts should be submitted to the editor for our peer-review process at drjahanmarcu@ajendomed.com