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The Role of Pharmacist-led Medicinal Cannabinoids Dispensaries

Raheem Wint, Doctor of Pharmacy Candidate; Marissa Cornish, Doctor of Pharmacy Candidate; Makayla D Marshall, Doctor of Pharmacy Candidate; Bisrat Hailemeskel, Professor & Vice Chair*

Department of Clinical & Administrative Pharmacy Sciences, College of Pharmacy, Howard University, Washington, DC, USA
College of Pharmacy, Howard University, 2300 4th Street, NW, Washington, D.C. 20059, USA

***Corresponding author:** Bisrat Hailemeskel, B.Pharm., MSc, Pharm.D., RPh, Professor & Vice Chair, Clinical & Administrative Pharmacy Sciences, College of Pharmacy, Howard University, 2300 4th Street, NW Washington, DC 20059 USA. Email: bhailemeskel@howard.edu

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Abstract

***Objective**: To determine student pharmacists' opinions on medicinal cannabinoids and the role of a pharmacist in cannabis dispensaries.*

***Methods:** First year pharmacy participants were asked to complete a survey assessing their opinions on medicinal cannabinoids, and the role of a pharmacist in cannabinoids and dispensaries, using an online survey with Likert-scale type questions.*

***Results:** Forty-four participants were surveyed in which 41 (93%) of answered all of the questions presented. Majority of participants were female (n=34, 77.3%), with more than half of participants being in the age range of 18-24 (n=25, 57%). Geographically, most of the participants home residence are other states out of the DMV, while local participants are from Maryland (27.3%). In addition, majority of participants had pharmacy and health related (81.9%) occupations before pharmacy school, earning >$10K a year (38.6%) and had a for 4-year education (59%).*

***Conclusion:** Majority of participants were in favor of more cannabinoids-related education being available for pharmacists. They also support overwhelmingly increasing the role of pharmacists in dispensaries, sale and distribution of medicinal cannabinoids, and legalization of marijuana in all states. Participants had split opinions on wanting to own a cannabinoid dispensary, and half the participants were familiar with state laws regarding distribution, development, and sale of medicinal cannabinoids products. A significant number of females support the notion that pharmacists should have more control of cannabinoids dispensaries. However, more females disagreed the presence of pharmacists should be required as a mandatory requirement to run dispensaries comparing to their counterparts. Those who live in the DMV area and those with more years of work experience before joining the pharmacy program claim to be familiar with the rules and regulations pertaining cannabinoids dispensaries, the development, distribution and dispensing of cannabis than those who live in other states, combined. More college education showed a negative association with interest in being a dispensary owner. Overall, medicinal cannabinoids are making its way into the medical field and pharmacy participants seem to be in favor of its implementation and support the role of a pharmacist in the medicinal cannabinoid sector.*

Introduction

In the past decade, the perspective and use of marijuana in medicinal therapy has experienced a cultural shift. The term "medicinal cannabis" is a general term describing various forms of consumption of the components of the cannabis plant for medicinal purposes. Although considered an illegal schedule I substance under the Controlled Substances Act by the federal government, on a state-level, a total of 36 states have approved medical marijuana/cannabis use and programs [1]. Currently, the Food and Drug Administration (FDA) has approved one cannabis derived product and three cannabis-related products for drug therapy. Epidiolex, a cannabis-derived drug containing cannabidiol (CBD), is used for treatment of seizures associated with Lennox-Gastaut and tuberous sclerosis. Marinol, Syndros and Cesamet are drugs used to treat nausea and vomiting in cancer patients who have undergone chemotherapy, in which the active ingredient is a synthetic form of delta-9-tetrahyrdocannabinol (THC), the psychoactive agent typically found in the Cannabis plant [2].

Majority of states have deemed medicinal cannabis legal, in which more than half of the US population will have access to such therapy. In 2014, according to the Substance Abuse

and Mental Health Services Administration, it was reported that 22.2 million Americans reported the use of cannabis [3]. According to medicalmarijuana.procon.org, as of 2018, twenty-six out of the twenty-nine states where medical marijuana is legal, there are currently 2,132,777 patients that are approved and have access to medical marijuana [4]. This legalization correlates with the general populations view on marijuana, as seen in a Quinnipiac University poll which reported that 54% of voters favored the use of medicinal cannabis [5].

A sparked interest in medicinal cannabis therapy has led to an increased amount of cannabis dispensaries. Furthermore, this has led to pharmacist-led dispensaries due to pharmacist's expertise knowledge of pharmacotherapy and how drugs affect the body. In 2012, Connecticut was the first state that required dispensing of medicinal cannabis to be conducted by a licensed pharmacist. Louisiana classifies pharmacist-led dispensaries as pharmacies, and states such as Minnesota and Arkansas require the involvement of pharmacists to be involved in dispensing and patient counselling [6].

With the introduction of a new avenue of therapy, it is imperative to understand the opinions and perception of prospective pharmacists and their role in the dispensing of medicinal cannabis. A 2015 survey conducted by Drug Topics had surveyed 715 pharmacists, 48% were in favor of pharmacists having oversight of state-approved medical marijuana dispensaries [7]. Although limited, there is literature in which surveyed the opinions of student-pharmacist views on cannabis therapy, its place in the medical field, as well as knowledge of therapeutic use. A 2015 study conducted by Moeller et. al. surveyed 311 pharmacy participants from the University of Kansas, finding that majority of participants had positive opinions of medicinal cannabis's place in therapy. However, participants also exhibited a lack of knowledge of the efficacy and side effects associated with medical marijuana and felt uncomfortable with counselling[8]. Another study was conducted in order to expand on the aforementioned survey nationwide, to determine if legal status of medicinal cannabis impacted student's perception and knowledge of therapy. It was found majority of participants, 91%, had positive perception of medicinal cannabis and its legality, however, participants exhibited a lack of knowledge of cannabis therapy and the ability to counsel patients [8,9]. These findings correlate with a similar study conducted by Pereira et. al. that assessed the knowledge and attitudes of nursing participants regarding medical marijuana at the University if Santiago de Compostela (Spain) It was found that more than 75% of participants agreed with the legalization of medical marijuana, however, had a lack in knowledge of drug interactions, safety and efficacy [10]. It is worth noting these opinions highly differ from those seen over fifty years ago, in which a study by Burke and Marx surveyed the attitudes of professional participants on psychoactive substances, which only 16% of participants favored use of medical marijuana [11].

In the aforementioned studies, a limitation was the demographic of participants assessed at the time of the study. At the time of the study conducted by Moeller et. al. most participants attending the University of Kansas College of Pharmacy were residents of Kansas, predominantly Caucasian [12], and Kansas at the time did not legalize the use of medical marijuana [13]. A similar case can be stated for the study conducted by Pereira et. al. in which it was conducted at another country, primarily upon the residents of Spain. This study conducted at Howard University provides insight of opinions from a different set of demographics, in order to get a further understanding what role demographics play in the participants' opinions regarding medical cannabinoids.

The objective of this study is to further understand the opinions of student-pharmacists on medicinal cannabis and their role in relation to the dispensary. Without a doubt, medicinal cannabis is developing and finding its way into the future of healthcare, especially in the pharmaceutical sector. Therefore, it is imperative to understand the outlook of future prospects who may be working within the realm of medicinal cannabis.

Methods

This study was conducted using a one-time online survey of pharmacy participants in their first professional year at Howard University College of Pharmacy. The survey was optional, administered and recorded online as a part of the drug information course which is a mandatory two credit hour course in the College.

The questionnaire comprised of 16 questions in total, with eight questions regarding demographics and eight questions regarding the opinions of medicinal cannabis and the role of the pharmacist. Opinions were rated using a 4-point Likert-scale (strongly agree to strongly disagree). Responses were entered into an Excel worksheet. The data then was transferred and analyzed using the SPSS Statistical software. Frequency was analyzed for demographics, while crosstab and chi-square were used to analyze opinions, with a p-value less than 0.05 deemed significant. The responses were then statistically analyzed via SPSS statistical software.

Results

A total of 44 pharmacy participants were surveyed in which 41 participants filled out the questionnaire in its entirety (93% response rate). As expressed in Table 1 (a-c), demographics of participants were as follows: majority of participants were female (*n*=34, 77.3%), with more than half of participants being in the age range of 18-24 (*n*=25, 57%). Geographically, most of the participants home residence are other states out of the DMV area, while local participants are from Maryland (*n*=22; 27.3%). In addition, majority of participants had pharmacy and health related (*n*=36; 81.9%) occupations before pharmacy school,

earning >$10K a year (*n*=26; 61.4%) and had a for 4-year education or higher (*n*=30; 68.2%).

Gender	N (%)
• Male	10 (22.7)
• Female	34 (77.3)
Age	
• 18-24	25 (56.8)
• 25-34	18 (40.9)
Home state before Howard	
• DC	4 (9.1)
• MD	12 (27.3)
• VA	9 (20.5)
• Others	19 (43.2)

Table 1a: Demographics of participants (N = 44).

Have worked before Howard	
• Yes	42 (94.4)
• No	2 (4.5)
Annual Income	
• <10K	17 (38.6)
• $10-19K	7 (15.9)
• $20-29K	3 (6.8)
• $30-39K	8 (18.2)
• $40-49K	3 (6.8)
• >$49K	5 (11.4)
Type of work	
• Pharmacy Related	27 (61.4)
• Non-pharmacy related	9 (20.5)
• non-pharmacy or health related	7 (15.9)
How many years have you worked before Howard	
• 0	1 (2.3)
• <1 Yr	7 (15.9)
• 1-3 Yr	14 (31.8)
• 4-5 Yr	11 (25.0)
• >5 Yr	11 (25.0)

Table 1b: Demographics of participants (N = 44).

Highest level of Education	
• Some college	12 (27.3)
• 2 years	2 (4.5)
• 4 years	26 (59.1)
• Professional	4 (9.1)

Table 1c: Demographics of participants (N = 44).

According to results shown in **Table 2,** overwhelming number of participants (*n*=41; 93.2%) were in favor of incorporating cannabinoids-related education being available for pharmacists interested in working in a dispensary. Only a little more than half participants (*n*=21; 51.2%) participants agreed that a pharmacist should not be

required in a dispensary and does not have to be the only individual that can dispense. However, over three-quarter of the participants (*n*=33; 78.6%) were in support of pharmacists having more oversight.

When the participants were asked if they support the involvement of pharmacists in sale, dispensing and distribution of medicinal cannabis, almost three-quarter of the participants (*n*=32; 74.4%) agreed. Less than half (*n*=19; 44.2%) participants were familiar with rules and regulations. An overwhelming number of participants (*n*=36; 81.8%) supported the legalization of cannabis use nation-wide. Although most support legalization, a smaller number of participants (*n*=30; 68.2%) participants agreed that cannabis be incorporated as a drug therapy for medical illness depending on the severity of the disease. Despite their support, only less than half (*n*=21; 47.7%) were interested in being a dispensary owner after becoming a pharmacist.

N (%)				
	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
• Believe there should be more studies and education in cannabinoids for pharmacists interested	22 (50)	19 (43.2)	2 (4.5)	-
• Believe the role/presence of a pharmacist is not required in a cannabinoid dispensary and does not have to be the only one that can dispense medication/ product.	4 (9.3)	17 (39.5)	12 (27.0)	10 (23.3)
• Strongly support pharmacists having more oversight and control over the sale and distribution of cannabinoids, regardless of use.	18 (42.9)	15 (35.7)	6 (14.3)	3 (7.1)
• Against pharmacists being involved in cannabis dispensary, sale, or distribution.	4 (9.3)	7 (16.3)	12 (27.9)	20 (46.5)
• Familiar with the rules and regulations that pertain to the development, distribution, and sale of cannabis.	6 (14.0)	13 (30.2)	10 (23.3)	14 (32.6)
• Support the legalization of cannabis use in all states	23 (52.3)	13 (29.5)	4 (9.1)	4 (9.1)
• Interested in becoming a dispensary owner after becoming a pharmacist.	8 (18.2)	13 (29.5)	13 (29.5)	10 (22.7)
• Believe the incorporation of cannabis into treatment should depend only on the severity of disease	9 (20.5)	21 (47.7)	9 (20.5)	5 (11.4)

Table 2: Frequency of Survey Responses, *n* = 44.

As observed in Table 3, Chi-square analysis was used to determine significance of the association between demographics and student's opinions, defined as p<0.05. Gender showed a strong association with participants' opinion strongly supporting pharmacists having more oversight and control over the sale and distribution of cannabinoids, regardless of use (*n*= 33; 67%; *p*= 0.016) and the opinion that only pharmacists should be required to run cannabinoids dispensaries (*n*=19; 44%; *p* =0.016). Regarding familiarity with the rules and regulations pertaining to cannabinoid development, distribution and sale, the state where a student resided before admission to pharmacy school exhibited an association (*n*= 13; 30%; *p*=0.012), as well as the years of work experience in which those with less than 3 years of work were less familiar (*n*=7; 43.8% vs. *n* = 9; 56.3%; *p* =0.040) one year. The student's occupation type showed a relationship in the opinion of legalization of cannabis in all states (pharmacy related n = 24; 55.8%, *p*=0.013) as well as the incorporation of cannabis into therapy depending on the severity of the disease (pharmacy and health-related *n*=26; 60.5%; *p*=0.035). In regard to owning a dispensing pharmacy, level of education in which college education of four years showed a negative association relationship (*n*=12; 46.2%; p= 0.018).

	p- values
Gender vs. Strongly support pharmacists having more oversight and control over sale and distribution regardless of use	0.016
Gender vs. Pharmacists should only be required to run cannabinoids dispensaries	0.016
State Lived Before Howard vs. Familiar with the rules and regulations pertaining to development, distribution, and sale of cannabis	0.012
Years of work experience vs. Familiar with the rules and regulations pertaining to development, distribution, and sale of cannabis	0.040
Type of Occupation vs. Support the legalization of cannabis uses in all states	0.013
Type of Occupation vs. Believe in the incorporation of cannabis into treatment depending on severity of disease	0.035
Highest Education vs. Interested in becoming a dispensary owner after becoming a pharmacist	0.018

Table 3: Demographic factors in association with survey questions.

Discussion

The role of a pharmacist in a cannabis dispensary is to provide patient-centered care through appropriate consultation of medications and helping to create better patient-individualized therapeutic regimens. Cannabinoid-based therapy is becoming more widespread, in which prescribers are implementing these therapies in conjunction with other medications. Extensive medication lists are prone to events such as drug-drug interactions and increased risk of adverse events, and it is important that a patient's therapy is formulated and specific to them. This makes the pharmacist especially suited in the duty of specialized therapy such as cannabinoids, where some states have made it required by law for a pharmacist to be on site in a cannabis dispensary.

Overall, the aim of this study was to assess the opinions of student pharmacists on medicinal cannabis and the role of pharmacists in this field. Majority of participants responded in favor of medicinal cannabis and its place in therapy, as well as legalization in all states, similar to opinions seen in research conducted by Moeller and Woods [6,7]. In this study, over eighty percent of participants supported legalization in all states and 61% were in favor of its use in medicine.

Most of the survey responses rated positively, in favor of medicinal cannabis related education, pharmacists having more insight and overview of sales and distribution of medicinal cannabis, the legalization of cannabis in all states, and the incorporation of cannabis depending on severity of disease. These results are remarkably different from studies observed by Burke & Marx, in which took place in 1969, in which majority of the participants were against the medical and recreational use of marijuana [13].

As seen in Table 3, certain demographics may have had an influence on participants opinion. Accordingly, a significant number of females support the notion that pharmacists should have more control of cannabinoids dispensaries comparing to their counterparts (Males *n*=5; 16.1% vs Females *n*=26; 89.7%; p=0.016). A similar difference was seen among the genders when asked about the necessity of pharmacists to be a mandatory requirement to run dispensaries. Female participants also agreed significantly comparing to male participants that the presence of pharmacists should not be required as a mandatory requirement to run dispensaries (Males *n* =5; 16.1% vs. Females *n* =26 (83.9%); *p*=0.016).

The state where a student resided before Howard also showed an association with students' opinions as well. Those who live in the DMV area (Maryland, Virginia, District of Colombia) agreed to be familiar with the rules and regulations pertaining cannabinoids dispensaries the development, distribution and dispensing of cannabis than those who live in other states combined (DMV *n*=12; 75% vs. Other States *n*=4; 25%; *p*=0.012). This may be due to marijuana being decriminalized in Washington D.C, in addition to the medicinal dispensaries that are present in the city; participants may be more aware of the laws and regulations regarding it. Furthermore, the number of years the participants held a job before joining Howard showed an association with being familiar with the rules and regulations as well. Those who has had 3 or less years of work experience seems to be less familiar with the regulations comparing to those who have over 3 years of experience (0-3 years *n*=7; 43.8% vs. *n* = 9; 56.3%; *p* =0.040).

The kind of occupation a student had, whether pharmacy related, non-pharmacy related or non-pharmacy/non-health related showed an association with students opinions. Students with a pharmacy and health-related occupation showed a strong association with agreeing that cannabis should be legalized in all states (n=32; 74.4%; p=0.013) and with incorporation of cannabinoids into treatment depending upon severity of the disease (n=26; 60.5%; p= 0.035).

Education level showed an association with interest in being a dispensary owner in which majority of students in each subset disagreed with being a dispensary owner (some college n= 4 out of 12; 33.3%; professional school n=1 out of 4; 25%) except for those with a 4-year education, in

which more than half agreed to being interested in being a dispensary owner once becoming a pharmacist (n=14 out of 26; 53.7%; p= 0.018).

The data extracted from this study supports the notion that pharmacy participants support the implementation of medicinal cannabis in therapy and believe there should be more education and resources in the field. Although positive, there were various limitations in this study. The most significant limitation is the narrow scope in which this study was conducted, being that the sample size was rather small (*n*=44, with 41 respondents), and participants were only from one institution. Future studies should include a larger sample size in order to appropriately assess the general opinions of professional participants in regard to the subject. The questionnaire consisted of eight questions, in which to truly understand the attitudes and knowledge of participants, more extensive question should be incorporated. In addition, this survey only assessed first-year professional participants, it would be of interest to survey them as they matriculate throughout the program, as well as obtain the opinions of other professional year participants.

Conclusion

The overall perception of cannabis is changing. Once considered solely a recreational drug, it is now beginning to make strides into modern medicine. In this study, a survey instrument was used to get the opinion of pharmacy students on the various factors related to cannabinoids and their respective dispensaries. Majority of participants were in favor of more cannabinoids-related education being available for pharmacists. They also support overwhelmingly increasing the role of pharmacists in dispensaries, sale and distribution of medicinal cannabinoids, and legalization of marijuana in all states.

A significant number of females support the notion that pharmacists should have more control of cannabinoids dispensaries. However, more females disagreed the presence of pharmacists should be required as a mandatory requirement to run dispensaries comparing to their counterparts. Those who live in the DMV area and those with more years of work experience before joining the pharmacy program claim to be well familiar with the rules and regulations pertaining cannabinoids dispensaries the development, distribution and dispensing of cannabis than those who live in other states combined. Students with a pharmacy or health-related occupations supported the legalization of cannabis in all states and the incorporation of cannabis into treatment based on severity of the disease. More college education level had a negative association with interest in owning a dispensary after graduation from pharmacy program, however, a little over half of those with four-year education agreed to showing interest in becoming a dispensary owner after pharmacy school.

As implied by the findings in this study, the implementation of medicinal cannabis in therapy is growing, and participants are in favor of its place in medicine. Student pharmacists are in favor of pharmacists having more oversight on medicinal cannabis and being involved in the development, sale and distribution of cannabinoid medications. In addition, participants feel marijuana should be legalized nation-wide, similar to what is happening legislatively as many of the states in America have begun to decriminalize marijuana and expand on its research and place in medicine. Even though only a few states have legislation requiring pharmacists to be present at a cannabis dispensary, it is evident that pharmacists are uniquely qualified due to expertise in therapeutic regimens, drug-drug interactions and medication knowledge, hence the role of a pharmacist may be further diversified and in demand. As previously mentioned, participants agree that pharmacy-school curriculums may need to implement courses including the study of medicinal cannabinoids in order to develop future pharmacists that are ready for this new avenue of therapy.

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