

Assessing Physicians' Perspectives and Knowledge of Medical Marijuana and the Delaware Medical Marijuana Act

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Abstract

Objective: To examine physicians' perspectives and knowledge of medical marijuana.

Data Sources/Study Setting: Primary cross-sectional data was collected from physicians practicing in Delaware (DE).

Study Design: Eighty-five physicians completed a survey assessing their: a.) knowledge of medical marijuana, b.) likelihood and concerns regarding authorizing patients to use medical marijuana, c.) sources of information about medical marijuana, d.) proposed resources to learn more about medical marijuana and Delaware Medical Marijuana Act (DE MMA).

Data Collection: The survey was sent to members of the Medical Society of Delaware. Survey data from close-ended questions were analyzed using a statistical analysis software package. Data from open-ended questions were analyzed by hand through thematic categorization and frequency analysis.

Principle Findings: A majority of participants reported being less than knowledgeable about medical marijuana as a treatment option and about the DE MMA specifically. Lack of Knowledge and Potential Misuse/Abuse were the most cited concerns regarding authorizing medical marijuana, and the majority of participants stressed the desire for educational resources.

Conclusions: Providers play a key role in connecting patients to this therapy option, it is therefore imperative to provide engaging educational resources to providers, patients, and the general public.

Key Words: Medical Marijuana; Health Policy; Physician Attitudes; Physician Knowledge

INTRODUCTION

The Delaware Medical Marijuana Act¹ (DE MMA) became effective July 1st 2012, making Delaware the 15th state in the U.S. to implement a program allowing for the legal use of botanical cannabis[†] for medicinal purposes. As of July 2015, 22 other states, the District of Columbia, and Guam have passed similar legislation. State-based regulatory initiatives began with California's Proposition 215, "The Compassionate Use Act of 1996" - the first to legally allow patients to possess and use cannabis if recommended/approved by a physician. Although numerous state governments have ratified the legal use of botanical cannabis for medicinal purposes, and such use has the support of various reputable scientific/academic societies, the Federal Government still lists marijuana as a Schedule I drug under the Controlled Substances Act (1970)². This Schedule I classification maintains the label that marijuana has "...no currently accepted medical use in treatment in the United States", and, in turn, stifles potential research on the efficacy of

botanical cannabis for various symptoms and afflictions. Furthermore, despite the consistent state-based authorizations for patient utilization of marijuana for medicinal purposes, minimal research has explored physicians' attitudes and perspectives regarding authorizing patients to use medical marijuana, or their knowledge of the nuances of the medical marijuana policy within the state they practice.

This study examines Delawarean physicians' perspectives on enabling patients to obtain and utilize marijuana for medicinal purposes as well as their knowledge of the DE MMA in general. As the medical marijuana program continues to unfold in Delaware (The First State Compassion Center, Delaware's first medical marijuana distribution center, opened its doors on June 26th, 2015), it is necessary to assess practitioners' knowledge of and attitudes towards the program in order to better understand providers' stance on the treatment and policy, promote effective and efficient healthcare policy, and potentially develop and offer quality educational programs for providers and patients alike.

The Current State of Medical Marijuana and an Apparent Lack of Clinical Knowledge

In reviewing the current state of the literature on medical marijuana, specifically that featuring physicians' viewpoints and perspectives of the initiatives, it is evident there is a great deal of confusion regarding state-based medical marijuana programs and the therapeutic use of marijuana in general. The issues and concerns raised by providers include: the "gap" between state and federal laws, the actual medicinal efficacy of cannabis for particular ailments, the potentiality and probability of abuse, the lack of standardized conceptualizations of key terms referenced in policies (i.e. what constitutes a "bona fide" doctor-patient relationship), and

perceived possible legal ramifications related to signing off on a patient's use of marijuana, a severe lack of rigorous scientific clinical research on the endocannabinoid system and botanical cannabis as a therapeutic treatment, among others³⁻¹¹.

Although states have ratified medical marijuana legislation, the Federal Government, including the FDA and Drug Enforcement Agency (DEA), continues to categorize botanical cannabis as a Schedule I drug. The American Medical Association (AMA), the Institute of Medicine (IOM), the American College of Physicians, and other professional health-oriented societies have called for the FDA to reclassify marijuana as a Schedule II drug to open the door for more thorough empirical testing of botanical cannabis in order to establish clinical standards related to dosage, potency, vehicle (e.g. smoking, inhaling vapor, edible-based, pill-form, topical, etc.), the neurological and physiological nuances of various compounds, as well as “best practices” in regards to discussing and authorizing marijuana as a treatment option with patients – yet the classification remains.

Although the 1999 IOM report¹² provided evidence for the therapeutic benefit of marijuana in combating symptoms such as nausea/vomiting, pain, and significant loss of appetite, there are still mixed findings regarding the actual effectiveness of medicinal marijuana as a treatment option for ailments and illnesses^{13,14}. Furthermore, there are conflicting stances on the actual potentiality of abuse/addictive nature of marijuana, with some physicians citing the troublingly addictive nature of marijuana and specific reports indicating that marijuana is no more addictive than anti-anxiety medication, and far less addictive than alcohol and tobacco^{12,15}. There is also discussion regarding medical marijuana diversion, especially among adolescents, and the impact

of the availability of and societal-level norms associated with marijuana, as well as if the legalization of medical marijuana actually lends to increased overall marijuana use among populations¹⁶⁻¹⁹.

From the literature, it appears physicians may feel somewhat confused, frustrated, and/or unaware regarding their state's medical marijuana policies and programs, especially concerning the lack of research/clinical knowledge and their own responsibilities/duties (treatment-wise, legal, and interpersonal) concerning patient care. Yet, there has been minimal research exploring physicians' perspectives and attitudes regarding medical marijuana, questions or concerns they may have, or even their knowledge of their state's medical marijuana policy. If state officials are interested in implementing effective, efficient, and beneficial medical marijuana policies and programs, it is essential to assess where their practitioners "stand" on this debate, their proclivity and potential determinants to approve patients for the use of medical marijuana, and their understanding of the state and federal laws (including their own rights as physicians) associated with medical marijuana. Put simply, physicians are key agents in the realization of these policies – yet their voice has been somewhat muted in the current research. This study explores Delawarean physicians' attitudes and perspectives of the state's unfolding policy and their possible concerns regarding the use of marijuana as a medical treatment option.

Methods

Two members of the author team worked closely with representatives from the Medical Society of Delaware (MSD) and the Delaware Department of Health and Social Services (DHSS) (Division of Public Health (DPH)), to construct a brief survey to assess physicians': a.)

knowledge of the DE MMA, b.) likelihood (and reasoning) of authorizing *qualified* patients to use medical marijuana, c.) sources of knowledge of medical marijuana in general, d.) concerns regarding authorizing medical marijuana as a treatment option for qualified patients, and e.) suggestions of what would be helpful in learning more about the Delaware Medical Marijuana Act and medical marijuana as a treatment option. Demographic questions such as gender, age, years of practice, and primary specialty were also included in the survey.

The survey (hardcopy and a link to an e-version) was included in the November 2014 issue of the Delaware Medical Journal, which is sent to all physicians who are members of the MSD. The survey included a brief description of the study, noted that respondents' identity would remain confidential, and provided the contact information for the Delaware DPH if respondents had any questions related to the survey or the state's medical marijuana program. Institutional Review Board (IRB) approval for the use of human subjects was obtained by the authors' institution.

Measures

Knowledge: To assess physicians' knowledge of medical marijuana as a treatment option, as well as their state's medical marijuana policy, they were asked: a.) *At this time, how would you rate your knowledge about medical marijuana as a treatment option?*, and b.) *At this time, how would you rate your knowledge about the Delaware Medical Marijuana Act, which became effective July 1, 2012?* Participants were provided response categories ranging from *Little/No knowledge* to *Very knowledgeable* (i.e., Likert-scale). Physicians were also asked to indicate any and all of their sources of information regarding medical marijuana; they were provided a list of various resources to choose from (e.g., medical literature, news media, DHSS, lectures/seminars,

among others) but allowed to list others as well – and were able to select more than more source of information.

Likelihood/Comfort to Authorize: In order to better understand physicians’ proclivity to authorize their patients to attain marijuana as a treatment option, respondents were asked, *At this time, how comfortable do you feel authorizing patients to use medical marijuana?* The question included a list of all the qualifying debilitating conditions (as outlined by DE MMA). Answer categories ranged from *Very Unlikely* to *Very Likely* (respondents were also allowed to select, *I would not see patients with any of these conditions*). In the question that followed, participants were asked to elaborate on their answer (i.e., *why* they selected the answer category they did). Respondents were also asked to list and describe any specific concerns they had regarding authorizing patients to attain marijuana as a treatment option.

Sample

Eighty-five physicians responded (out of over 1,600 members of the MSD). Using the qualifying debilitating medical conditions outlined by the DE MMA, primary specialties listed by the respondents (the question was open-ended) were categorized on the basis of: (1) specialties that are likely to encounter/manage patients with these conditions either directly or as a referral source (e.g., “Hematology/Oncology”, “Hospice and Palliative Care”, “Rheumatology”), (2) specialties which are not likely to encounter/manage patients with these conditions given their scope of practice (e.g., “Surgery”, “Pulmonary”, “Gynecology”, “Reproductive Health”, (3) primary care/generalists (e.g., “Family Practice”, “General Practice”, “Internal Medicine”) – the highest percentage of respondents - this specialty group is likely to encounter patients with these

conditions, and may in turn authorize patients, (4) Emergency Medicine, and (5) Pediatricians. Although Pediatricians could be included in the Primary Care/Generalist group, given the controversy and debates surrounding allowing children and young adults to utilize medical marijuana as a treatment option, we thought it best to extract them from the primary care/generalist group so as not to possibly impact the results.

Of the entire sample, there were 66 men and 19 women. A majority of respondents were between the ages of 56-65 (37%), yet 22% were 66 or over, 22% were 46-55, 16% were 36-45, and only 2% of the sample was between the ages of 25 and 35. Whereas most participants reporting having practiced medicine between 31 and 40 years (31%), 29% reported practicing for 21-30 years, 22% reported practicing for 11-20 years, 10% reporting practicing for 1-10 years, and 8% reported practicing for 41 or more years

Analyses

Basic modes and frequencies were calculated for each close-ended question. A series of cross-tabulations and bivariate correlations were constructed to investigate potential significant relationships between demographic information and variables measuring likelihood and degree of knowledge. Table 1 presents the most frequently reported answer (by age, years of practice, and specialty group) for *Knowledge of Medical Marijuana*, *Likelihood to Authorize*, and *Sources of Information*. Regarding the open-ended questions, the author team read through all responses and identified prominent, reoccurring thematic categories. The responses were then grouped into these categories and frequency analyses were then conducted - counting the number of responses within each category. This was done for each open-ended question to identify the most common

“type” of response to each question. Given the sample size of each specialty, comparisons were not made between groups. Rather, prominent categories among *all* participants’ statements were identified. These answer categories, their frequencies, and exemplary representative data (participants’ statements) are featured in Table 2.

Results

Table 1: Most Frequently Reported Category (and %) for Knowledge of Medical Marijuana, Likelihood to Authorize, & Sources of Information by Age, Years of Practice, & Specialty Grouping

Group (n)	Knowledge about Medical Marijuana	Knowledge about DE Medical Marijuana Act	Likelihood to Authorize	Sources of Information*
25-35 (2)	Minimal Knowledge (50%), Knowledgeable (50%)	Minimal Knowledge (50%), Knowledgeable (50%)	Very Unlikely (50%), Possibly (50%)	Medical Literature (50%), News Media (50%), Other Physicians (50%), Lecture/Seminars (50%), DHSS (50%)
36-45 (14)	Knowledgeable (46.2%)	Somewhat Knowledgeable (38.5%)	Very Unlikely (33.3%)	Medical Literature (64.3%)
46-55 (19)	Somewhat Knowledgeable (37.5%)	Somewhat Knowledgeable (56.3%)	Very Unlikely (42.9%)	Medical Literature (73.7%)
56-65 (31)	Somewhat Knowledgeable (43.3%)	Knowledgeable (30%)	Very Unlikely (25%), Possibly (25%)	Medical Literature (75%)
66+ (19)	Knowledgeable (38.9%)	Somewhat Knowledgeable (42.1%)	Very Unlikely (41.2%)	Lectures/Seminars (73.7%)
1-10 (9)	Knowledgeable (62.5%)	Knowledgeable (37.5%)	Very Unlikely (25%), Possibly (25%), Very Likely (25%)	Lectures/Seminars (66.7%)
11-20 (18)	Somewhat Knowledgeable (44.4%)	Somewhat Knowledgeable (50%)	Very Unlikely (46.7%)	Medical Literature (78.9%)
21-30 (24)	Somewhat Knowledgeable (45.5%)	Somewhat Knowledgeable (39.1%)	Very Unlikely (28.6%)	Medical Literature (76%)
31-40 (27)	Somewhat Knowledgeable (44%)	Minimal Knowledge (32%), Knowledgeable (32%)	Very Unlikely (26.1%), Likely (26.1%)	Medical Literature (77.8%)
41+ (7)	Knowledgeable (71.4%)	Somewhat Knowledgeable (42.9%)	Very Unlikely (57.1%)	Lecture/Seminars (100%)
Specialties Likely to Encounter (22)	Knowledgeable (40.9%)	Somewhat Knowledgeable (50%)	Very Unlikely (38.9%)	Medical Literature (90.9%)
Specialties Unlikely to Encounter (17)	Somewhat Knowledgeable (41.7%)	Somewhat Knowledgeable (46.2%)	Very Unlikely (40%)	Medical Literature (58.8%)
Primary Care / Generalists (36)	Somewhat Knowledgeable (40%)	Minimal Knowledge (31.4%)	Very Unlikely (34.3%)	Medical Literature (64.9%)
Emerg. Med (6)	Knowledgeable (50%)	Somewhat Knowledgeable (75%)	Very Unlikely (25%), Unlikely (25%), Possibly (25%), Likely (25%)	Medical Literature (100%)
Pediatricians (4)	Knowledgeable (50%)	Knowledgeable (50%)	Possibly (33.3%), Very Likely (33.3%)	Medical Literature (66.7%)

*Respondents were able to select more than one Source of Information.

Knowledge of Medical Marijuana as a Treatment:

Of the physicians who responded to the survey, 8.8% reported having “little or no knowledge” about medical marijuana as treatment compared to 16.3% who felt they possessed “minimal knowledge”, 36.3% who felt “somewhat knowledgeable”, 35% who felt “knowledgeable”, and 3.8% who felt “very knowledgeable”. Interestingly, those with the least and most time practicing reported greater knowledge than others: The majority of respondents with 1-10 and 41 or more

years of experience were more likely to consider themselves “knowledgeable” about marijuana’s use as a medical treatment (62.5% and 71.4% respectively) compared to respondents with 11-20, 21-30, and 31-40 years of experience who considered themselves to be “somewhat knowledgeable” (44.4%, 45.5%, and 44% respectively).

Respondents from specialty areas that were considered likely to encounter eligible patients generally reported feeling “somewhat knowledgeable” (31.8%) or “knowledgeable” (40.9%) about medical marijuana as a treatment. Similarly, primary care physicians, who are also likely to encounter eligible patients, reported feeling “somewhat knowledgeable” (40%) or “knowledgeable” (25.7%). Pediatricians reported feeling “somewhat knowledgeable” (33.3%) or “knowledgeable” (50%). Specialists considered not likely to encounter eligible patients reported feeling “somewhat knowledgeable” (41.7%) or “knowledgeable” (33.3%). A minimal number of respondents reported feeling “very knowledgeable,” including 4.5% of specialists that are very likely to encounter eligible patients and 5.7% primary care physicians. No pediatricians or physicians who specialize in fields unlikely to encounter eligible patients reported feeling “very knowledgeable”.

Knowledge of DE MMA:

Overall, respondents reported less knowledge of DE MMA than of marijuana as a treatment option. Of the total sample, 9.9% reported “little or no knowledge” and 23.5% reported “minimal knowledge”. In contrast, 38.3% reported “somewhat knowledgeable” while only 21% and 7.4% reported feeling “knowledgeable” and “very knowledgeable” respectively. There were no

discernible differences in regards to age or years of practice and reported knowledge of DE MMA.

The majority of specialists likely to encounter eligible patients reported feeling “somewhat knowledgeable” (50%) or “knowledgeable” (18.2%) about the DE MMA. Primary care physicians reported “minimal knowledge” (31.4%), “somewhat knowledgeable” (28.6%), or “knowledgeable” (22.9%). Interestingly, pediatricians and specialists not likely to encounter eligible patients reported greater knowledge of the DE MMA (16.7% and 15.4%, respectively) compared to specialists likely to see eligible patients (4.5%) and those in primary care (5.7%).

Comfort with Likelihood of Authorization:

Half (50%) of the participants reported that they were uncomfortable with authorizing medical marijuana: 16.2% said they were “unlikely”, and 33.8% said they were “very unlikely” to authorize medical marijuana use for eligible patients. However, half (50%) of respondents reported they were “possibly likely” (16.2%), “likely” (16.2%), or even “very likely” (17.6%) to authorize medical marijuana use for patients that present eligible conditions. There were no discernible differences between age groups, however, there were noticeable differences between groups of years practicing. Practitioners with 41 or more years of experience reported being “very unlikely” (57.1%) to authorize medical marijuana use compared to respondents with 1-10 years (25%), 11-20 years (46.7%), 21-30 years (28.6%), or 31-40 years (26.1%) of experience.

Although 33.3% of specialists likely to see eligible patients reported they are “very likely” to authorize medical marijuana, 38.9% reported they are “very unlikely”. Among primary care

physicians, 34.3% were “very unlikely” to authorize while 20% were “likely”. Of pediatricians, 33.3% were “very likely” and 33.3% would “possibly” authorize, compared to only 16.7% who were “likely” and 16.7% who reported “very unlikely” to authorize.

The relationship between physicians’ level of knowledge about medical marijuana and their level of comfort authorizing its use was statistically significant ($r=.400$, $p=.000$). There was also a significant relationship between knowledge of the DE MMA and one’s comfortability with authorizing its use ($r=.277$, $p=.017$). Put simply, it was found that the more knowledgeable about medical marijuana in general, and the DE MMA in particular, the more comfortable physicians are with authorizing its use.

Source(s) of Information:

Respondents’ sources for information on medical marijuana treatment and policy varied considerably. The most frequently cited sources of information included medical literature (72.4%), lectures and seminars (52.9%), news media (43.5%), other physicians (36.5%), and experiences with patients (36%). Less frequently cited sources were Department of Health and Social Services (DHSS) (14.9%), family and friends (11.5%), and practice policy (3.4%).

Age was found to correspond with certain information sources. Although approximately 75% of the physicians that were 46 and older cited medical literature as an information source, only 64.3% of respondents 36-45 years of age and 50% of the respondents 25-35 years old reported the same source. Similarly, whereas about half of respondents 25-35, 36-45 years old and 56-65 years old cited lectures and seminars as an information source, the percentage was much higher

for respondents 66 years and older (78.9%). Also, younger respondents were more likely to cite other physicians as a source of information.

Years of practice also appears to relate to preferred information sources: 75% of respondents with 11-40 years of experience reported using medical literature as a source of information whereas 55.6% of respondents with 1-10 years of experience and 42.9% of respondents with 41+ or more years in the field reported the same source. About two-thirds of respondents with 1-10 and 31 or more years of experiences reported lectures and seminars as information sources, but only 31.6% of physicians with 11-20 years cited the same source. Similar to age, those respondents with the least years of experience (1-10 years) were likely to cite other physicians as a source of information.

Medical literature was cited as a source of information by 90.9% of specialists likely to encounter eligible patients, 64.9% of primary care physicians, 58.8% of specialists not likely to encounter, 100% of those in emergency medicine, and 66.7% of pediatricians. Prior experience with patients was reported as a source by 45.5% of specialists likely to encounter eligible patients and 43.2% of primary care physicians, 50% of physicians in emergency medicine, and 33.3% of pediatricians, but only 6.3% of physicians who are in a specialty area unlikely to encounter eligible patients. Half of specialists likely to encounter eligible patients and 41.7% of primary care doctors cited news media as a source of information, whereas 66.7% of the pediatricians, 25% of those in emergency medicine, and 37.5% of specialists unlikely to see eligible patients cited the same source. Although about half of pediatricians and half of those in emergency medicine cited other physicians as an information source, only about 25-40% of

respondents in other specialty groups cited the same source. Seminars and lectures were reported as sources of information by 54.5% of specialists likely to encounter eligible patients, 51.4% of primary care physicians, 47.1% of specialists who are unlikely to encounter eligible patients, 75% of those in emergency medicine, and 66.7% of pediatricians. Emergency medicine physicians were the most likely to cite DHSS as a source of information (25%), whereas pediatricians were the least likely (0%). Although only 11.5% of respondents reported using friends/family as a source, 33.3% of pediatricians and 25% of emergency medicine physicians cited friends/family.

Among respondents who reported “little or no knowledge” about medical marijuana as a treatment, 85.7% did *not* cite medical literature, other physicians, or DHSS as an important source of information; none (0%) relied on prior experiences with patients, and 71.4% did *not* cite lectures and seminars for information. However, over two-thirds of these respondents reported relying on news media. In contrast, 100% of physicians who considered themselves “very knowledgeable” about medical marijuana treatments cited medical literature and lectures and seminars, and about 66% cited experience with patients, other physicians, media, and DHSS as sources of information. Respondents’ knowledge of DE MMA did not generally correspond to information sources. There was one exception: respondents who cited lectures and seminars as sources of information reported having a much higher degree of knowledge of the Act than did respondents who did not cite lectures and seminars.

Interestingly, medical literature, experience with patients, and lectures and seminars were commonly cited by respondents that reported being likely or highly likely to authorize medical

marijuana for treatment. In contrast, news media was cited more commonly among respondents who are unlikely to or will possibly authorize medical marijuana for treatment.

Open-Ended Questions

Table 2: Frequency of Categorized Responses

DOMAIN	CATEGORY	FREQ.	PARTICIPANT'S STATEMENTS
Comfort w/ Authorizing (would not)	<i>Lack of knowledge</i>	18	"Not comfortable with prescribing something about which I have virtually no knowledge."
			"Would need to know more about law and indications."
	<i>Not "prescriber"/ unlikely to see pts</i>	13	"I would not consider myself knowledgeable enough about the medication to prescribe or educate patients."
"Not a prescribing care giver."			
<i>Potential for abuse/misuse</i>	8	"I typically do not treat any patients with those disease."	
		"Unlikely to see patients in this stage of illness."	
		"Liberalizing it's use will only open the door to more serious drug abuse!"	
Comfort w/ Authorizing (would)	<i>When other Rx fail</i>	18	"As a hospice physician, I am certain to run into patients with the qualifying conditions whose symptoms are not being relieved with more standard therapies. At that point, I am OK with a pt trying medical marijuana."
			"I often care for patients with chronic cancer pain or other chronic pain syndromes for which I feel they may ultimately benefit from medical marijuana, if other treatments have failed or have been maximized."
	<i>Effectiveness/benefits/humane treatment</i>	16	"I see patients with diseases that I do not have a treatment for. If there is research suggesting that Med Marijuana may be effective for these patients I am likely to offer that as a treatment option."
"These are serious, chronic diseases, many that are fatal. These are legitimate reasons for marijuana usage and humane."			
			"There is no question in my mind that marijuana is beneficial for patients with chronic debilitating illnesses. It should be administered via a vaporizer as a supplement to other medication. Indeed, it would probably be more effective, less expensive, and less addicting than the more traditional medications."
			"For the right patient, medical marijuana can provide relief from pain. Patients should be given an alternative to the usual medications presently available."

Table 2 Con't: Frequency of Categorized Responses

DOMAIN	CATEGORY	FREQ.	PARTICIPANT'S STATEMENTS
Specific Concerns w/ Authorizing	<i>Potential for abuse/misuse / diversion</i>	25	"My concern would be that people, other than the intended person, would use the drug. It should not be used for recreational purposes."
			"As with any other controlled substance, diversion is an area to be aware of."
	<i>Legality issues (for pt and provider)</i>	8	"Patients coming in requesting medical marijuana for abuse purposes under the guise of vague conditions like intractable nausea that I cannot prove is occurring."
"legal related to state and federal prosecution for supplier and pt."			
<i>Lack of standardization (quantity & quality)</i>	7	"Concern is what can the patient do if questioned by police."	
		"Marijuana is still illegal in the United States of America, of which Delaware remains a part. The DEA a federal agency, gives us our licenses to prescribe controlled substances. Marijuana is still considered a 'category one' narcotic, meaning there is no legitimate medical use. Thus, I am concerned that recommending a schedule one narcotic to my patients, could in theory, put my DEA license at risk and possibly subject me to federal criminal sanctions."	
		"How to ensure that the marijuana isn't tainted. How to rate one's response to it. How to quantify usage."	
Helpful to Learn More	<i>Education: Courses (online and CME-sponsored), seminars, lectures, pamphlets, reviews of DE Law</i>	27	"Will not authorize. No standard dosing."
			"It is a mind altering substance, and the quality control varies from batch to batch."
	<i>Clinical/Empirical research</i>	12	"Concise written educational material."
"Online course sponsored by the State and MSD."			
			"A review of the law, as to how the dispensaries will work, how patients will be able to fill and refill, RX limits, and a review of the literature about medical marijuana."
			"Clinical studies indicating effectiveness, rage of use as a treatment modality."
			"Well-designed studies to show safety and efficacy and give dosing and strain information."
			"More independent research on the effects of Med marijuana in specific disease states."

In response to *why* participants reported their degree of likelihood to authorize patients to utilize medical marijuana as a treatment option, *Lack of Knowledge* (about medical marijuana as a treatment option in general, as well as the DE MMA specifically) was the most frequently stated concern. However, it is important to note that a number of participants reported their willingness to authorize patients *When other Prescription Drugs Fail*, and many noted the perceived potential *Effectiveness/Benefits* for their patients. The *Potential for Abuse/Misuse* was also a commonly reported issue that impacted participants' comfort-level with authorizing patients to attain medical marijuana.

Participants were also asked to offer specific concerns (if any) with authorizing patients to attain medical marijuana as treatment option. Again, *Potential for Abuse/Misuse* was a very common response (the most frequently expressed concern by participants for this specific question). This category also included concerns regarding *Diversion* and statements referring to medical marijuana as a "gateway drug". *Legality Issues* were the second most frequently stated concern. Interestingly, participants often expressed worry about the legal issues surrounding authorizing and maintaining their licenses and own practice, yet many also expressed concern for their patients' rights. *Lack of Standardization* regarding potency, strain, dosage, and quality, was the third most frequently stated concern with authorizing.

Regarding what would be helpful in learning more about medical marijuana as a treatment option and the DE MMA, participants stressed the importance and desire for more *Education*. This category included responses referring to Continuing Medical Education (CME) sponsored courses, online courses, seminars, lectures, pamphlets, and reviews for the DE MMA

specifically. Participants also frequently expressed the need for more *Clinical/Empirical Research* examining the effectiveness of medical marijuana as a treatment for various diseases/ailments and appropriate strains and dosage.

Discussion & Conclusion

With 23 states and DC and Guam enacting laws providing marijuana as a viable medical treatment option for certain patients it is essential to explore providers' (i.e. those granting authorization to attain medical marijuana) perspectives and knowledge regarding state-specific medical marijuana laws and medical marijuana in general. Providers play a (if not *the*) key role in connecting patients to this potential therapy, yet very little is known regarding how physicians' feel about medical marijuana and what they understand about the processes and procedures of authorizing their patients as well as their own and their patients' rights.

This study found that the majority of physicians that participated in this study feel less than knowledgeable about medical marijuana as a treatment option, and know even less about their state's medical marijuana law specifically. Furthermore, only about half of the participants in this study would "possibly" consider authorizing patients with qualifying conditions to attain medical marijuana (with only about 34% reporting being "likely" or "very likely" to authorize), and there was notable variation within specialty groups regarding the likelihood to authorize patients. These findings are somewhat concerning - not that it is imperative to increase the number of physicians likely to authorize, but if state governments are implying that medical marijuana is a legitimate medical treatment option for specific ailments and symptoms by enacting the law, it would appear problematic, if not detrimental to the full potential of the policy

and even possibly patient well-being, that many physicians: a.) lack valuable knowledge of the policy and the treatment option, and b.) are unwilling to even consider discussing it with their (qualified) patients as an option.

Participants cited *Lack of Knowledge* and *Potential for Abuse/Misuse/Diversion* as the most significant concerns regarding authorizing patients. As discussed earlier, the literature concerning potential abuse and diversion is somewhat mixed and therefore, given this relative “grey” area of research, there is not a black/white or yes/no response. However, increasing, enhancing, and maintaining knowledge of medical marijuana and state-specific medical marijuana laws is a promising and manageable directive. As suggested by the participants, particular organizations/institutions (e.g. DHSS, DPH, MSD, AMA, perhaps even prominent state universities) could provide courses, seminars, and other various educational materials and resources for providers to become more acquainted with this “new” treatment option, the law, as well as their own and their patients’ rights.

In a recent Canadian study featuring over 400 providers, Ziemianski et al.¹¹ found similar knowledge gaps among their participants regarding medical marijuana as a treatment option and medical marijuana policy, and much like this specific study, the strong majority of participants desired more education (about the treatment and policy). Moreover, the concerns and barriers expressed by physicians regarding medical marijuana as a treatment option featured in this specific study echo those found by Ziemianski and colleagues (e.g. misuse, lack of standardization, liability issues). It is important to note, however, that whereas Delawarean physicians and patients have only had about three years with the medical marijuana law,

Canadian physicians and patients have had access to medical marijuana as a treatment option since 1999. It is notable that the findings from this specific study mirror those where the law has been in existence for over 15 years - specifically the reported lack of knowledge among participants. Unfortunately, although Ziemianski et al. do present their participants' preferred formats of educational information (many of which mirror those offered by the participants of this specific study), they do not speak to any specific educational efforts or initiatives regarding medical marijuana provided by any levels of Canadian government or medical institutions/organizations. Similarly, in their study of over five hundred Coloradan family physicians, Kondrad and Reid⁴ found a strong desire among participants for more educational opportunities about medical marijuana, but the authors offer no specific examples of state- or federally-sponsored educational programs for physicians or the public. In fact, at that time (2013), their study of physician attitudes regarding medical marijuana was the first (and only) conducted in a state where medical marijuana had been legalized, and Kondrad and Reid even explicitly call for CME resources to be developed for physicians to learn more about the treatment and the law. Yet, it would appear that this call (and others that followed) has gone unheeded despite state after state enacting and approving medical marijuana policies increasing the number of physicians legally able to authorize patients to attain marijuana as a treatment option. In short, it seems as though the laws are in place but few providers actually know about them. These gaps could have significant impact on best practices concerning medical marijuana, authorization rates (i.e., under- and over-authorization), patients' knowledge of their treatment options and rights, patient satisfaction, doctor-patient communication, and the longevity and livelihood of the policy itself. States that have enacted medical marijuana policies provide specific information about the law on the state government website. However, one could argue

that these sites are not the most user-friendly or likely-to-be-accessed resource. Therefore, given this apparent absence of engaging educational resources for patients and providers, future research should explore the location and availability of any and all educational materials and resources, and examine if and how patients and providers access and utilize these resources.

The physicians featured in this study also desired more empirical evidence (such as that provided by clinical studies) to help shape their understanding of the effectiveness and best practices of medical marijuana as a treatment option. However, the future of marijuana research is somewhat hindered by the current FDA classification of marijuana as a Schedule I substance. Because of this significant barrier to research, it is imperative that state governments and medical organizations (e.g., AMA) offer providers and patients educational programs to increase awareness of and adherence to policy guidelines. Regarding Delaware specifically, clear and shared understandings of all aspects of the Delaware medical marijuana program will be essential for the healthcare workforce, as well as patients and the general public. Educational initiatives should include discussions on state and federal policies, the science of botanical cannabis, and even “best practices” (for doctors and patients) associated with discussing marijuana as a treatment option. Furthermore, more attention should be given to evaluative efforts, which may include: a.) assessing various aspects of the state medical marijuana program and policies, b.) the development and implementation of educational programs, and c.) evaluating doctor-patient interactions concerning medical marijuana as a treatment option. As states continue to move forward in this new (yet old) frontier of patient care, more collaboration between academia, medicine, and government is needed to provide essential translational education and research to healthcare providers, patients, and the general public.

This study has several potential limitations, most notably is the small sample size. Not only does this low number of responses suggest selection bias and a lack of representatives of even Delawarean physicians, but also negatively impacts the generalizability of the findings and the scope of our analysis. However, given that we found lack of knowledge (of medical marijuana and the DE MMA) to be prevalent among the participants, perhaps the lack of response among MSD members could be reflective of an overarching cloud of uncertainty among physicians. Furthermore, because many of our key findings mirror those featured in similar studies with much larger sample sizes, we are confident that our findings do suggest prominent attitudes and knowledge “gaps” among practicing physicians regarding medical marijuana as a treatment and medical marijuana policy.

Notes

† For the sake of clarity, within this paper, the terms medical marijuana, marijuana, and botanical cannabis will be used synonymously (and are to be considered distinct from pharmaceutical cannabinoids – synthetic cannabinoid-based medications)

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Conflict of Interest

I declare that I have no proprietary, financial, professional or other personal interest of any nature or kind in any product, service and/or company that could be construed as influencing the position presented in, or the review of, the manuscript entitled: "Assessing Physicians' Perspectives and Knowledge of Medical Marijuana and the Delaware Medical Marijuana Act."