

MEDICAL CANNABIS: HEALTHCARE PROFESSIONALS'
ATTITUDES, PERCEPTIONS, AND BEHAVIORS

by

Kelly A. Earle

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ABSTRACT

Background: The medical marijuana industry and the sociopolitical atmosphere in which it exists have evolved tremendously over the past decade. However, little is known about the healthcare professionals' attitudes, perceptions, and behavior toward patient use of medical marijuana. In order to understand the legitimacy of medical cannabis in the future of palliative care, it is important to understand the beliefs and perceptions of healthcare professionals. **Objectives:** The purpose of this scholarly project was to (1) assess the attitudes, perceptions, and behavior of healthcare professionals surrounding medical cannabis through an online survey, (2) provide a live learning opportunity about medical cannabis to staff at an 89-bed rural hospital, and (3) determine if the educational opportunity allowed for staff to feel more comfortable discussing medical marijuana with patients. **Methods:** A Survey pretest was sent out via email to the staff at Bozeman Health Deaconess Hospital. The largest number of participants were RNs or LPNs (67%, n=103) followed by MDs or DOs (15%, n=23) and NPs (10%, n=16). A live educational opportunity was provided for staff members. Those staff were asked to participate in a post-survey after the educational opportunity. **Results:** Most of the participants cared for patients who use medical marijuana (n=108, 70%). Furthermore, 13 (64%) MDs/DOs and 13 (67%) NPs/PAs either agree or strongly agree that medical cannabis is a legitimate therapy. Fifty people participated in the live educational opportunity, of which 20 participated in the post-survey. Post-survey demonstrated: 12 (60%) said they felt more comfortable discussing cannabis with patients, five (25%) said they were not more comfortable, and three (15%) said they did not know if they felt more comfortable after the educational opportunity. **Discussion:** With the growing number of users across the United States, it will be essential that those who work in patient-care areas are able to bring clarity to patients who may be curious about the use of medical cannabis for palliative measures. However, more research is needed, specifically surrounding the longitudinal effects of chronic use of cannabis.

Keywords: medical marijuana, cannabis, palliative care, healthcare professionals, opinions, attitudes, beliefs

CHAPTER ONE

INTRODUCTION

Marijuana is the dried flowers and leaves of the cannabis plant. The main active compounds are delta-9-Tetrahydrocannabinol (THC), which is psychoactive or mind altering, and other cannabinoid compounds including cannabidiol (CBD), cannabinol, cannabichromene, cannabidivarin, cannabigerol, and tetrahydrocannabinivirin. These are considered non-psychoactive but may produce their own central nervous system effects to alter the overall effect of THC (Wilkinson et al., 2015; CDC, 2018). The flower of the plant can be pressed into an oil and mixed into butters and foods. Thus it can be inhaled, vaporized, ingested, or used topically. A report by Grand View Research (2018) estimated that the legal marijuana industry would be worth \$146 billion by the year 2025, and it is anticipated that the medicinal use is expected to account for over 75% of that growth.

Terms

For the purpose of this paper we will be evaluating the evidence and existing literature surrounding medical marijuana. Because of the nebulous terms and lack of clinical research surrounding the topic of marijuana, we will define some of the terms that will be used throughout the paper here. It should be noted that the terms cannabis and marijuana will be used interchangeably throughout the discussion.

Medical Marijuana or Medical Cannabis: refers to all aspects of the marijuana plant that are used strictly for medicinal purposes.

Adult-Use Marijuana/Cannabis or Recreational Marijuana/Cannabis: refers to the use of marijuana for recreation and not palliative or medicinal properties.

Endocannabinoids: naturally occurring receptor ligands, such as Anandamide (AEA), that work on Cannabinoid-1-Receptor (CB1) and Cannabinoid-2-Receptor (CB2), which are found throughout the body.

Phytocannabinoids: plant based cannabinoids such as THC, CBD.

Cannabinoids: receptor ligands that work on Cannabinoid-1-Receptor (CB1) and Cannabinoid-2-Receptor (CB2). Encompasses both endocannabinoids and phytocannabinoids.

THC: (cannabinoid) delta-9-Tetrahydrocannabinol, a psychoactive or mind-altering compound found in the marijuana plant.

CBD: cannabidiol (cannabinoid), a non-psychoactive, non-mind-altering extract of marijuana that is used in marijuana products, primarily for pain control.

Background

Policy and Use

Evidence suggests that the cannabis plant may have been used as early as 2900 BC for medicinal applications (Deitch, 2003). In the nineteenth and twentieth centuries, cannabis was widely used for its medicinal purposes in the United States (US). However, federal restriction of the use and sale of cannabis first occurred in 1937 with the passage

of the Marihuana Tax Act (Bridgeman & Abazia, 2017). The penalties for sales and possession increased throughout the 1950s via the enactment of the Boggs and Narcotic Control Act. Ultimately, prohibition was achieved through The Controlled Substances Act of 1970 (Bridgeman & Abazia, 2017). This law placed all regulated substances into one of five schedules. Placement is based upon medical use, abuse potential, and safety or dependence liability. Schedule I substances are considered to have the greatest risk within these criteria, whereas Schedule V are considered the safest. Marijuana (and marijuana extract) is a Schedule I drug along with drugs such as phenylcyclohexyl pyrrolidine (PCP) and ecstasy or MDMA. Cocaine, Morphine, and opium are Schedule II (DEA, 2019). However, these laws are quickly changing. According to Hartig and Geiger (2018), 62% of Americans believe marijuana should be legalized. Moreover, majorities in age groups—millennials (74%), Gen Xers (63%), and Baby Boomers (54%)—believe that marijuana should be legalized. As these populations age, it is reasonable to assume that the liberalization of marijuana will continue.

In 1996, California was the first state to legalize marijuana for medicinal purposes. Proposition 215, the Medical Marijuana Initiative (1996), criminally exempted patients and caregivers who possessed or cultivated marijuana for medical treatment recommended by a physician. Since then, 10 states have legalized adult-use marijuana, and 33 states have some sort of medical marijuana program (National Cannabis Industry Association, 2019). Currently, U.S. Senate Bill 3174, cited as the “Marijuana Freedom and Opportunity Act,” moves to decriminalize marijuana and remove marijuana from the schedule of controlled substances under the Controlled Substances Act (2018). This bill

also removes the prohibition on all import and export of marijuana. The bill has been sent to be reviewed by the U.S. Senate Committee on the Judiciary as of February 13, 2019 (SB 3174, 2018). As recently as 2019, one drug product containing CBD and as little as 0.1% THC was approved by the Food and Drug Administration (FDA) as a Schedule V drug (DEA, 2019).

With the evolving policy, the use of marijuana has increased. One National Survey on Drug Use and Health, with 147,200 participants, showed prevalence of medical marijuana use increased from the years of 2013 to 2015 from 1.2% to 1.6% (Han et al., 2018). Furthermore, this study showed that patients who use marijuana medicinally are every-day or nearly every-day users (Han et al., 2018). Many of these patients are using medical marijuana for chronic pain.

Pain Control and Opioids

The National Institute of Health (NIH) estimates that more than 130 people die every day after overdosing on opioids (2019). In the late 1990s providers began to prescribe opioids in greater rates after being reassured by pharmaceutical companies that patients would not be addicted. This led to a great misuse of opioids, and overdose rates began to increase. In 2012, it was estimated that the total U.S. healthcare cost associated with pain was between \$261 and \$300 billion per year (Gaskin & Richard, 2012). In 2017, approximately 1.7 million people suffered from substance-use disorders related to prescription opioids and that more than 47,000 Americans died from opioid overdose “including prescription opioids, heroin, and illicitly manufactured fentanyl” (NIH, 2019). It is also estimated that 21% to 29% of patients who are prescribed opioids will misuse

their prescription and that 8% to 12% of individuals will develop an opioid-use disorder. Furthermore, 80% of people who use heroin first misused prescription opioids (NIH, 2019). In a 15-year follow-up study of over 20,000 adults, researchers found that patients who used marijuana but not other substances such as cocaine, heroin, inhalants, and hallucinogens, were not at an increased risk of mortality over those who had never used marijuana (Muhuri & Gfoerer, 2011). The National Academy of Sciences states, “due to the limitations of current surveillance tools and medical-record-coding systems, there is a limited amount of comprehensive and precise data on the association between cannabis use and overdose injury or death” (p. 20).

Problem and Rationale for the Project

The growing number of opioid-related issues necessitate that providers and healthcare professionals be able to educate patients about other possible interventions for chronic pain, including the use of medical marijuana. In an analysis of Medicaid enrollees, researchers found that “State implementation of medical marijuana laws was associated with 5.88% lower rate of opioid prescribing” (Wen & Hockenberry, 2018).

The state of Montana legalized use of Medical Marijuana in 2004. Since then, there have been numerous challenges and revisions to the original law (Montana Department of Health and Human Services, 2019). Regardless of challenges at the legislative level, registration for the medical marijuana program has increased in the state of Montana. According to the Montana Department of Health and Human Services (MDHHS), as of January 2020, over 36,000 patients are medical marijuana card holders.

This is an increase from October, 2018, when just over 29,000 patients were Montana medical marijuana card holders (MDHHS, 2019). Of the 36,000 patients who use medical marijuana in the state of Montana, over 28,000 patients are prescribed medical marijuana for severe chronic pain (MDHHS, 2019). However, little is known about the knowledge base and perceptions of medical marijuana among Montana healthcare professionals. With this growing increase in patient interest in medical marijuana, providers and healthcare personnel are being asked by patients to share information surrounding medical marijuana (Ebbert et al., 2018). Yet, one survey of primary-care providers in Minnesota, a state with a medical marijuana program, found that one-half of providers surveyed were not ready or did not want to answer questions about medical cannabis (Philpot et al., 2019). A similar study conducted in the state of Washington, a state with an established adult-use program, found that healthcare professionals reported low knowledge and minimal comfort surrounding the topic of medical marijuana (Carlini et al., 2017).

Purpose of the Project

The purpose of this project is threefold. First is to determine the perceptions of medical marijuana and medical marijuana users among healthcare professionals: Licensed Practical Nurses (LPNs), Registered Nurses (RNs), Nurse Practitioners (NPs), Medical Doctors (MDs), Doctors of Osteopathy (DOs), and Physician Assistants (PAs). Second is to deliver an educational opportunity among healthcare employees pertaining to the current, relevant literature and evidence surrounding medical marijuana and

cannabis research. Lastly is to determine if exposure to current research (as result of the educational opportunity delivered) is sufficient in increasing comfort in discussing medical cannabis use with patients.

Significance of the Problem to Nursing Practice

According to the National Cannabis Industry Association, 43 out of 50 of the states in the US have some form of legalized marijuana program (2019). However, as marijuana is still illegal at the federal level, strong evidence of the effects of medical cannabis is still emerging. Epidemiological and small research studies show promise within the use of medical marijuana for ailments such as chronic pain, adjunctive seizure medication, and Crohn's disease. Nonetheless, clinicians are left with an important question with opioid overdoses on the rise: "Will medical marijuana play a role in the future of palliative care?" As patients navigate through their healthcare plan surrounding chronic pain, it will be necessary for healthcare professionals to be able to educate patients about the use and corresponding effects of medical marijuana.

In 2016, the American Nurses Association (ANA) issued a statement in order to reiterate "support for the review and reclassification of marijuana's status from a federal Schedule I controlled substance to facilitate urgently needed clinical research to inform patients and providers on the efficacy of marijuana and related cannabinoids" (ANA, 2016). Although epidemiological studies and small research trials have been conducted to assess the benefits surrounding medical cannabis, more is needed, such as randomized control trials (RCTs), in order to guide practice. By assessing healthcare provider

perceptions of medical marijuana, we may be able to formulate an idea of what the future holds for medical marijuana in Montana. If favorability is associated with an intervention, will we see an overall shift of how chronic pain is treated? What will future evidence tell us of the longitudinal effects of medical marijuana on patient outcomes? By assessing healthcare professionals' perceptions of medicinal cannabis, we may be able to determine the reality of marijuana as a treatment plan for Montana patients within the realm of palliative care.

CHAPTER TWO

LITERATURE REVIEW

Presently, there is still a federal prohibition against the sale, use, and possession of marijuana. However, as individual states like Montana expand legalization, the sociopolitical landscape will continue to change (DEA, 2019). Accordingly, it is essential that healthcare professionals have a greater understanding of the possible risks and benefits medical marijuana may present in specific diseases or symptom management, as well as state and federal regulations surrounding marijuana prescription, use, and distribution or sale. However, it is important to note that evidence of effectiveness is limited. Due to the nature of medical marijuana being a Schedule I drug, there is a gross lack of randomized control trials (RCTs) within the field of medical marijuana research (Karst, 2018).

A comprehensive literature review was performed through online Montana State University (MSU) database searches until saturation of information occurred. Journal articles obtained from literary research databases CINAHL, COCHRANE LIBRARY, PSYCINFO, PUBMED, and MEDLINE were organized around themes in line with this paper and the state law of medical marijuana. The four themes were: risks of marijuana use, marijuana for pain control and opioid use, marijuana and anxiety and depression, and marijuana and providers' perceptions. The key words used for the literature search included medical marijuana, cannabis, cannabidiol (CBD); pain; pain control; quality of life, provider attitudes, risks; public health; mental health; and opioid use.

Evidence of Literature

What is Marijuana?

In its simplest form, marijuana is a plant that grows naturally, although recently it has become strategically cultivated in states with legalization laws. “Unlike pharmaceutical medications, marijuana is not a single-agent compound but a complex combination of more than 100 different chemicals” (Wilkinson et al., 2015, pg. 2). As previously stated, the primary psychoactive compound is THC; however, cannabinoid compounds, such as CBD, can cause “entourage effects” to potentiate the overall effect of the THC (Wilkinson, 2015). Perhaps even more challenging for healthcare providers is that the concentration of each compound varies significantly between different plant strains of marijuana. This makes positive or negative effects of marijuana difficult to isolate, especially within patient-perspective surveys or when trying to extrapolate trends from uncontrolled epidemiological studies. Furthermore, providers should be hesitant when making recommendations based on older data as more recent studies have found that the level of THC has increased dramatically from 1980s (Wilkinson et al., 2015).

Marijuana is primarily consumed via inhalation of smoke from the burning of the dried plant. Yet, to avoid potentially harmful byproducts of the smoke, patients and consumers have started to use more vaporized and edible products. However, there is no existing evidence that supports the idea that vaporizing marijuana is any safer than smoking the dried plant (Wilkinson et al., 2015). The onset of smoked products is nearly immediate while ingested products have a delayed onset of around 30–120 minutes. Ingested marijuana provides a lower and more irregular peak plasma level as well as a

prolonged action of the drug when compared to smoked marijuana. Thus, those who may be less familiar or novice users may become overwhelmed by the overall effects of cannabis when orally consumed (Wilkinson et al., 2015).

Although still illegal at the federal level, the FDA has approved the use of some medications that have isolated, purified, and tested individual components of marijuana. As recently as 2019, one drug product containing CBD and as little as 0.1% THC was approved by the Food and Drug Administration (FDA) as a Schedule V drug (DEA, 2019). Dronabinol (Marinol) is the oral form of THC and has been approved for use in the treatment of ailments such as cachexia due to HIV/AIDS and chemotherapy-induced nausea and vomiting. Other medications such as Nabilone (Casamet), a THC analog, have also reached FDA approval, while Nabiximols (Sativex), THC and CBD as an oral mucosal spray, has been approved for use in Canada and many European countries (Wilkinson et al., 2015). Because of the sociopolitical atmosphere surrounding cannabis, data was extrapolated from a variety of different sources, and animal studies were not excluded in order to provide a deeper understanding of the pathophysiological data on cannabis. Furthermore, the endocannabinoid system needs to be discussed in order to give clarity surrounding the mechanism of action of medical marijuana.

The Endocannabinoid System

The endocannabinoid system is a naturally occurring system in the human body heavily comprised of receptors and ligands known as “endocannabinoids” (Oltrabella et al., 2017). Endocannabinoids or endogenous cannabinoids, such as Anandamide (AEA) and 2-Arachidonoyl glycerol (2-AG), work on CB1 and CB2 receptors to help restore

homeostasis and modulate pain and inflammation (Fine & Rosenfeld, 2013). CB1 receptors occur heavily in the brain and central nervous system (CNS) and are the “most abundant receptors in the mammalian brain but are also present at much lower concentrations in a variety of peripheral tissues and cells” (Pacher, Batkai, & Kunos, 2006). CB2 receptors are primarily in the periphery (hematopoietic system, endocrine pancreas, bone, and nonparenchymal cells of the cirrhotic liver) and were recently found in the brain (Pacher et al., 2006). “Preclinical and clinical data support the potentially effective anti-inflammatory properties of endocannabinoid agonists that target CB2 receptors” (Bruni et al., 2018), making it easy to assume that receptor agonists would play some part in the future of pain control. Phytocannabinoids, such as those found in medical marijuana and cannabis (i.e., THC, CBD), have different functions within the endocannabinoid system. For instance, THC functions as a CB1, CB2 agonist whereas CBD does not have activity at CB1 or CB2 receptors, but instead is thought to inhibit AEA uptake and metabolism (Pacher et al., 2006). Furthermore, “cannabinoids are known to exert potent microglial-modulating effects” (Yirmiya & Rimmerman, 2020). Therefore, it is easy to deduce the utility of medical cannabis in a variety of different functions. However, human studies and longitudinal studies need to be evaluated further.

Risks of Marijuana

Marijuana is the most commonly used illicit drug in the US and, in 2014, more than 22 million Americans over the age of 12 reported current cannabis use (Lapoint et al., 2018). As the liberalization of marijuana evolves, it will remain important for healthcare providers to understand related risks. However, because of the restrictions

surrounding medical marijuana, there is limited high quality evidence to provide a greater understanding of the complete effects of medical marijuana on the patient. In vivo and in vitro studies provide evidence that marijuana works as an inhibitor on several hepatic enzymes (CYP2D6, CYP2C19, CYP2C9, CYP3A4) and preliminary evidence has also shown that marijuana may interact with human serum drug concentrations for medications such as warfarin and antiretroviral therapies (Karst, 2018). Thus, for any patients who report medical marijuana use, it will be important for the provider to closely evaluate serum drug concentrations in order to ensure that patients are maintaining therapeutic levels.

Both acute and chronic issues have been observed in conjunction with marijuana use in the literature. Some of the most common acute adverse effects of marijuana use include “asthenia, balance problems, disorientation, gastrointestinal effects, euphoria, somnolence, dry mouth, fatigue, hallucinations, paranoia, and agitation” (Karst, p.4, 2018). Though many of these issues resolve within a few hours, some marijuana-associated issues are more serious. Prolonged use of marijuana has been associated with a severe form of cyclic vomiting syndrome (CVS) called cannabinoid hyperemesis syndrome (CHS) (Sadiq, 2013). CHS symptoms involve significant nausea, vomiting, and abdominal pain relieved with compulsive hot baths or showers. In states with marijuana legalization, emergency room visits related to CHS have doubled since legalization (Lapoint et al., 2018). Episodes of CHS usually last 24–48 hours but can last up to seven days, making patients at risk for hypovolemia and thus requiring intravenous rehydration. Cessation of marijuana products resulted in 96% of resolution of symptoms

among patients who suffered from CHS; however, re-exposure to marijuana may cause symptoms to return (Lapoint et al., 2018).

Neurological effects of marijuana use have also been observed. General population studies have shown that long-term cannabis use is associated with small to moderate negative effects on cognitive function (Nugent et al., 2017). However, Walsh et al., (2017) found that “when not acutely intoxicated, the magnitude of these neurocognitive decrements range from about one-fourth to one-half of a standard-deviation (e.g., about 4 to 8 IQ points) with recovery approximately one month following cessation,” thus suggesting that there are limited long-term effects on cognition once marijuana cessation is achieved. However, neurocognitive effects are not the only issue that providers must address when treating patients who use medical marijuana. Marijuana users are also at risk for tolerance, dependence, and withdrawal (Karst, 2018). In a survey of patients who use medical marijuana in conjunction with their long-term opioid therapy (LTOT), defined as over three months of opioid use, those who used medical marijuana had a higher risk for prescription-opioid misuse than those who did not use medical marijuana. However, the same study demonstrated that there was no significant increase in hazardous alcohol use or nicotine use (Nugent, Yarbourourgh, Smith, Dobscha, Deyo, Green, & Morasco, 2018). DiBenedetto et al. (2018) found similar results in their retrospective chart review analysis of patients who were evaluated for a medication-management program. Those who used medical marijuana were more likely to indicate higher risk for opioid misuse (DiBenedetto et al., 2018). These similar results in relation

to opioid therapy use suggest that patients who use medical marijuana and opioids may have increased risk of misusing their opioid prescription.

Medical Marijuana, Pain, and Opioid Use

Some researchers estimate that anywhere from 11 to 40% of U.S. adults are living with chronic pain (Dahlhamer et al., 2018). The roles of cannabinoids and CB1, CB2 receptor agonists have shown promise in preclinical and clinical studies in the treatment of pain and inflammation (Bruni et al., 2018). Cannabinoids are known to modulate inflammatory markers throughout the body. For example, CBD has been shown to protect against intestinal inflammation (Bruni et al., 2018). Thus, it is reasonable to assume that, with greater research, phytocannabinoids, such as THC and CBD, could play a role in the future of pain control. However, it is currently first-line practice to treat pain with anti-inflammatory agents (both steroidal and nonsteroidal). When this treatment option is unsuccessful, treatment with procedural measures or the less expensive option of opioids is then considered.

Despite the increased risk of patients misusing opioids when using medical marijuana in conjunction with their LTOT treatment plan, medical marijuana users report little abuse of their medical marijuana prescription. One survey found that 81% of patients used marijuana recreationally before initiation of medical use. However, less than 3% reported transition from medical use to recreational use (Lucas & Walsh, 2017). This is in direct contradiction to the normal trend of opioid prescriptions, where medical use leads to dependence and recreational use (as cited in Lucas & Walsh, 2017). Among all the documented uses for medical marijuana, chronic pain is the most prevalent (Karst,

2018). In a clinical review, Hill (2015) determined that high quality evidence supported use of marijuana for chronic pain. However, in almost direct opposition, Nugent et al. (2017) found that, although there was a low level of evidence to support use of marijuana in neuropathic pain, there was insufficient evidence for other types of chronic pain. This is mainly due to the federal restrictions surrounding the use of marijuana and the lack of high quality evidence that these restrictions impose on the research. However, epidemiological surveys have evaluated trends in the data surrounding state legalization laws. Researchers conducted an analysis on opioid use, chronic opioid use, and high-risk opioid use for the years 2006–2014 among patients who were commercially insured (N=4,840,562). Patients who lived in states with medical marijuana legalization were found to have lower odds of opioid use, chronic use, or high-risk use (Shah, Hayes, Lakkard, & Martin, 2019). Similarly, in an analysis of Medicaid enrollees nationally, states with adult-use programs and medical marijuana programs were associated with 6.38% and 5.88% lower rate of opioid prescribing respectively (Wen & Hockenberry, 2018). This is significant as Medicaid enrollees typically have a higher risk of using and abusing opioids (Wen & Hockenberry, 2018). Furthermore, over the last few years, there has been an increase in literature that examines the substitution of opioids with medical marijuana. In a survey of authorized medical marijuana users, 71% of participants stated that they used medical marijuana instead of other substances, the most common substitution being for opioids (Lucas & Walsh, 2017). This is significant as the US navigates the current opioid epidemic. Marijuana has the potential to provide pain relief with relatively lower risk of addiction and virtually no risk of overdose when compared

to opioids (Hill, 2015). However, researchers have found that quality-of-life studies are mostly inconclusive. One systematic review found that patients who used marijuana for pain control, multiple sclerosis (MS), and inflammatory bowel disease reported improvements in health-related quality of life whereas patients who used medical marijuana for HIV or AIDS reported reduced health-related quality of life (Goldenberg et al., 2017). The differences of self-reported data could relate to the specific disease state and overall mental health surrounding the individual patient and disease process.

Medical Marijuana Depression and Anxiety

Depression and anxiety are complex ailments that involve a variety of different etiologies and mechanisms of action (Yirmiya & Rimmerman, 2020). However, “ample research demonstrates that the endocannabinoid system, as well as phytocannabinoids, can modulate stress responsiveness and associated psychopathology particularly in depression and anxiety” (Yirmiya & Rimmerman, 2020). Studies have also shown that THC and other CB1 receptors may influence antidepressant effects (Yirmiya & Rimmerman, 2020). Furthermore, scientists have discovered that the use of phytocannabinoids may also elicit the same effect.

Among general populations, limited existing evidence suggests that cannabis is associated with an increased risk for mental health effects (Nugent et al., 2017). Although the primary reason for medical marijuana use is chronic pain, some patients with easier access to medical marijuana report use of medical marijuana for mental health issues.

Despite the low level of evidence demonstrating efficacy of medical marijuana on such issues, one survey reported that many patients seek treatment for mental health

disorders such as eating disorders, PTSD, and psychiatric disorders (Lucas & Walsh, 2017). In fact, participants reported symptom management with mental health ailments such as stress (60%), insomnia (57%), and depression (46%) (Lucas & Walsh, 2017).

In patients who used opioids, there were no significant differences on pain-related variables, depression, or anxiety between patients who used medical marijuana in conjunction with LTOT and those who did not use medical marijuana with a LTOT treatment plan (Nugent et al., 2017). Furthermore, one study (Feingold et al., 2017) compared depression and anxiety, using the Patient Health Questionnaire (PHQ9) and the Generalized Anxiety Disorder scale (GAD-7), among patients who used opioids, those who used opioids and medical marijuana, and those who used only medical marijuana for pain control. Researchers found that among patients who received care for chronic pain, those who used opioids reported higher levels of depression and anxiety when compared to those who only used medical marijuana (Feingold et al., 2017). However, as previously stated, more research is undoubtedly needed in order to isolate the specific effects of medical marijuana. Providers and patients must weigh all risks and benefits with their health history in order to determine if medical marijuana is an appropriate intervention to treat chronic pain.

Medical Marijuana and Providers' Attitudes and Perceptions

Across the healthcare continuum, the specialty that perhaps has the greatest users of medical marijuana is oncology. One study (Braun, et al., 2019) evaluated oncologist's attitudes, knowledge, and practices surrounding the efficacy of medical marijuana. Researchers found that, among the 237 respondents, 82.8% reported that medical

marijuana has some end-of-life benefit. However, in the early stages of cancer, 33% of oncologists reported that there was at least one benefit, while 48.7% reported that it was rarely or never beneficial. Of the oncology providers who reported that there was benefit at end-of-life, most believed that medical marijuana was at least as effective as traditional Western medicine practices for end-of-life symptoms such as anxiety, nausea and vomiting, and poor appetite or cachexia (Braun et al., 2019).

For many patients, primary-care providers serve as frontline access to answers about healthcare questions. A Minnesota-based survey evaluated the knowledge, attitudes, and beliefs of primary-care providers in the utilization of medical marijuana. Similarly, 79% of these primary-care providers who completed the survey believed that medical marijuana was a legitimate medical therapy for pain. Furthermore, over 77% of primary-care providers surveyed reported that they would have interest in learning more about medical cannabis while only 50% reported that they felt ready to answer questions about medical cannabis (Philpot, Ebbert, & Hurt, 2019).

In a survey among healthcare providers in Washington state, researchers found that the knowledge base surrounding the state medical marijuana program and FDA approved cannabinoid medications was low (Carlini et al., 2017). Respondents who were not comfortable with recommending medical marijuana cited that they would need educational programs for healthcare providers, more clinical data, and more research, and a change in marijuana's federal legal status. Similarly, around 74% of providers surveyed believed that medical marijuana has the ability to help people who suffer from chronic conditions (Carlini et al., 2017). The state of Washington was the first to legalize

marijuana recreationally along with Colorado in 2012 (Hunt & Pacula, 2017). However, providers practicing in Washington state report little knowledge surrounding medical marijuana. It is reasonable to believe that because Montana's medical marijuana program excludes recreational use, providers may feel even less comfortable with issues surrounding the use of medical marijuana. As of 2019, there are no studies that assess the knowledge base, comfort level, and perceptions of medical marijuana among Montana healthcare professionals.

Theoretical Underpinning

A theoretical framework is the cornerstone of the DNP scholarly project. "Theory is used to guide nursing practice and provides an orderly way to view phenomena" (Moran, Burson, & Conrad, 2014, p. 95). The theoretical framework has the unique ability to represent real situations in clinical practice (Bonnell & Smith, 2014). Accordingly, the Social Cognitive Theory (SCT) will be used as a foundation for the structure of this project.

SCT was developed in 1986 (LaMorte, 2018) and is founded and evolved from Albert Bandura's Social Learning Theory (SLT) from the 1960s (LaMorte, 2018). SCT is unique in its examination of social influence and external and internal social reinforcements. SCT postulates that learning occurs through social and reciprocal interactions of the person, environment, and behavior. This theory focuses on the manner in which individuals acquire and maintain behavior while also reflecting upon the social climate in which the behavior is performed. It also considers individuals' past

experiences as an impact for future behavior. Ultimately, the goal of SCT is to establish how behaviors are achieved and maintained through personal and environmental reinforcements.

SCT is an appropriate theory and well suited to guide this project, which aims to evaluate the relationship between healthcare professionals' opinions and actions surrounding medical marijuana. The laws surrounding the legalization of marijuana are changing from state to state and Americans are demonstrating their favorable ideologies towards legalization of marijuana for medicinal and recreational use (Carliner, Brown, Sarvet, & Hasin, 2017). The SCT underpinning of this project was beneficial in order to understand the relationship between the sociopolitical atmosphere of medical marijuana and the practice or behavior of healthcare professionals. It is aimed at understanding previous experiences with marijuana (people) and attitudes and perceptions of medical marijuana as an intervention for palliative care (behavior) among healthcare professionals, in a sociopolitical atmosphere that is in flux (environment).

SCT Theoretical Concepts

The central tenet of SCT is that there is a reciprocal relationship among environment, people, and behavior. In order to demonstrate the relationship between these three factors, 11 concepts are utilized in SCT. For the DNP project proposed here, five of the 11 concepts are most aligned with the aims of the project. These five (environment, situation, behavioral capability, self-efficacy, and reciprocal determinism) will serve as the framework through which the project is conducted (Glanz et al., 2002).

Environment

According to Glanz et al. (2002), environmental aspects that are external to the individual have the ability to provide social support for action and ideology. As previously demonstrated, the literature surrounding medical marijuana for pain control is limited and, on occasion, contradictory. Yet, national surveys demonstrate that the ideology surrounding marijuana use is shifting towards favorability in the US (Carliner et al., 2017). This is a significant juxtaposition for healthcare professionals as they attempt to provide patients with autonomy while still observing Western medicine or allopathic norms.

Situation

The SCT conceptualizes situation as perceptions of the environment (Glanz et al., 2002). In any given situation along the healthcare continuum, healthcare professionals can be faced with situations where they do not feel adequately prepared. Patient inquiry about medical cannabis can place healthcare professionals in just such a position. Because healthcare professionals are first taught “do no harm,” the topic of medical marijuana can be plagued with ethical, legal, and physical ramifications for them and their patients. In order to understand their behavior towards medical marijuana, it is essential to understand their previous experiences (or situations) with medical marijuana, which can greatly influence their perception of the current situation. Given the sociopolitical environment surrounding medical marijuana, providers may express great variability in perceptions of the environment.

Behavioral Capability and Self-efficacy

SCT behavioral capability and self-efficacy refer to the ability for a person to participate in a certain action and the confidence they have to do that action. Though some providers may have the capability and confidence to recommend medical marijuana to their patients, others may feel underqualified or under educated to make such recommendations. In order to understand the variability in these possibilities, it will remain important to isolate variables such as age, sex, and specialty to determine their influence on overall self-efficacy and behavioral capability.

Reciprocal Determinism

Glanz et al. (2002) define reciprocal determinism as “the dynamic interaction of the person, the behavior, and the environment in which the behavior is performed,” meaning that individuals will act within their own self-mediated norms in order to create their own outcome. Previous experience is individual and may be an essential component that can be used to predict outcomes or, in this case, action. The ideology behind reciprocal determinism will be utilized to understand the likelihood of marijuana being prescribed for palliative care.

There are several studies that demonstrate the reciprocal relationship among environment, person, and behavior (Harell & Bennet, 1974; Lambert et al., 1997; Maue et al., 2004; Millstein, 1996). One study, which used SCT to evaluate physician behavior predictability, found a relation between social normative beliefs in influencing physician behavior (Millstein, 1996). Maue et al. (2004) utilized the SCT model theory of planned behavior to assess the relationship among physicians’ behavior, intentions, and

compliance in clinical practice guidelines. In a systematic review of social cognitive theories on healthcare professionals' behaviors and intentions, Godin et al. (2008) found that, while beliefs about consequences, social influences, past behavior, and knowledge were all important assessment factors in predicting behavior, belief of capabilities was the most significant variable in predicting behavior. Furthermore, improved frequency weighted means were observed in prediction of behavior when data was self-reported rather than objectively assessed (Godin et al., 2008). The aforementioned studies provide context in the use of the SCT and solidify that it serves as an appropriate framework to guide this project.

CHAPTER THREE

METHODS

Using SCT as the guiding framework, this project employed a pre/post quasi-experimental design to evaluate healthcare professionals' perceptions, attitudes, and experiences regarding medical marijuana. A survey previously distributed from researchers at the Mayo Clinic (Philpot et al., 2019) (Appendix A) was used to measure attitudes, perceptions of benefits, and previous patient-related experiences with medical marijuana of providers and staff at a Bozeman-area hospital. Slight modifications were made to the original to better suit the aims of this project and can be seen in the pre-test (Appendix B). The pre-test survey is a 15-item survey (Appendix B) made up of three demographic questions to assess profession, specialty, and years in profession; five "yes or no" questions to evaluate experience with patients who use medical cannabis, comfort in discussing medical cannabis with patients, if individuals have experience certifying patients to use medical cannabis (providers only), interest in learning, and support of de-scheduling medical marijuana; and seven Likert-scale questions to assess perceptions and attitudes of usefulness and comfort with discussing medical cannabis with patients. The pre-test survey was delivered using a web-based platform and was followed about three weeks later by a live lecture given by this author (Appendix C) based on literature related to ailments deemed appropriate for the registration of the Montana Medical Marijuana program, the endocannabinoid system, and the current state of the Montana Medical Marijuana program. Those in attendance for the live lecture were asked to participate in a

post-test evaluation (Appendix D) to further assess attitudes and perceptions using the same demographic questions and the same Likert-scale questions. Questions were added to the post-test (Appendix D) to evaluate if healthcare professionals felt more prepared to discuss medical cannabis use with patients and to evaluate if participants also took the pre-test that was sent out before the live lecture.

Setting

The proposed scholarly project was carried out at Bozeman Health Deaconess Hospital (BHDH), a rural hospital and longitudinal care organization. It is also the only multidisciplinary healthcare organization in Gallatin County, Montana. BHDH serves Gallatin County, Park County, and Maddison County. Within these counties, over 7,000 patients are registered participants in the medical marijuana program (MDHHS, 2019).

Sample

The population sample for this project was recruited from BHDH employees. Healthcare providers (doctors of medicine [MDs], doctors of osteopathic medicine [DOs], nurse practitioners [NPs], physician assistants [PAs], registered nurses [RNs], licensed practical nurses [LPNs], social workers, and pharmacists) were recruited via BHDH email and asked to participate in a web-based survey through the Qualtrics platform. There are 298 providers listed in the BHDH directory (BHDH, 2019). These providers encompass many different specialties (e.g., primary care, oncology, pediatrics, OBGYN, neurology, internal medicine, surgical services, etc.). Healthcare professionals such as

RNs and LPNs make up about 60% of the workforce at BHDH. This email was sent out on October 1, 2019, with a link to the pre-test (Appendix B). The live educational opportunity was offered October 24, 2019 (Appendix C), and the post-test evaluation (Appendix D) was sent to those who attended the live lecture.

Instruments

Researchers at the Mayo Clinic previously used a survey tool to assess providers' perceptions and attitudes toward medical marijuana (Philpot et al., 2019). This survey tool was pilot tested and questions were refined (Philpot et al., 2019). Permission was granted to the DNP student (author of this scholarly project) from researchers (Philpot & Ebbert) to use this tool as an outline. The original survey (Appendix A) was slightly modified to cater to Montana healthcare professionals rather than Minnesota primary-care providers and to align with the goals of this project, specifically to demonstrate the relationship of previous experience with relationship to medical marijuana as a provider.

Ethical Issues

This project was granted IRB exemption in May of 2019 by the Institutional Review Board of Montana State University (Appendix E). Commencement of the project occurred only after IRB approval was received.

CHAPTER FOUR

DATA ANALYSIS

Tables 1–4 illustrate the participant demographics and their experiences surrounding the Montana Medical Marijuana Program (MMMP) and patients who use Medical Marijuana. Participants’ previous experiences were evaluated in terms of being registered to certify patients for medical cannabis (Table 2), certification experience of patients (Table 3), and, finally, caring for patients who have been certified (Table 4). There was expected variability in responses to these questions. Of note, the largest number of participants were RNs or LPNs (67%, n=103), followed by MDs or DOs (15%, n=23), NPs (10%, n=16), and other staff members (6% n=9), and, finally, pharmacists (2% n=3).

Table 1: Q1—I am a:

#	Field	Count
1	Provider (MD/DO)	23
2	Provider (NP/PA)	16
3	RN or LPN	103
4	Pharmacist	3
5	Other	9

Only two (8%) MDs or DOs that responded were able to certify patients for the medical marijuana program. It is important to note that only MDs or DOs have the legal authority to certify patients in Montana. However, Table 3 shows that six (27%)

responded that they had certified patients in the past for the MMMP. This may indicate some confusion in the survey questioning. However, this does allow for some speculation in the variability. It is possible that some of the providers have previously certified patients for the MMMP but no longer have the availability to certify patients for the program. Table 4 speaks to experience with MMMP patients and indicates that most of those who participated in the survey care for patients who have been certified for the MMMP. Specifically, a total of 108 participants (70%) care for patients who have been certified for the MMMP. Also worth noting is that 21(91%) of the MDs/DOs care for patients who use medical marijuana.

Table 2: Q2—Are you registered to certify patients for medical cannabis in the Montana Medical Marijuana Program?

#	Question	Provider (MD/DO)	Provider (NP/PA)	RN or LPN	Pharmacist	Other					
1	Yes	8.70%	2	0.00%	0	0.00%	0	0.00%	0		
2	No	82.61%	19	93.75%	15	100.00%	103	100.00%	3	100.00%	9
3	Prefer not to answer	8.70%	2	6.25%	1	0.00%	0	0.00%	0	0.00%	0
	Total	Total	23	Total	16	Total	103	Total	3	Total	9

Table 3: Q3—Have you ever certified patients for the Montana Medical Marijuana Program? (Providers Only)

#	Question	Provider (MD/DO)	
1	Yes	26.09%	6
2	No	73.91%	17
3	Prefer not to answer	0.00%	0
	Total	Total	23

Table 4: Q4—Do you care for patients who have been certified?

#	Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
1	Yes	91.30%	21	87.50%	14	66.99%	69	33.33%	1	33.33%	3
3	Prefer not to answer	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0
2	No	4.35%	1	0.00%	0	4.85%	5	0.00%	0	44.44%	4
4	Don't know	4.35%	1	12.50%	2	28.16%	29	66.67%	2	22.22%	2
	Total	Total	23	Total	16	Total	103	Total	3	Total	9

Favorability was measured by a variety of questions illustrated in Tables 5A–5E.

Interestingly, 13 (64%) MDs/DOs and 13 (67%) NPs/PAs either agreed or strongly agreed that Medical cannabis is a legitimate therapy (Table 5A), and 87 (84%) RNs/LPNs believed medical cannabis is a legitimate medical therapy. While 70 (68%) RNs/LPNs believed doctors should be offering medical cannabis for various medical conditions,

only four (18%) MD/DOs and eight (53%) NPs/PAs agreed that providers should offer medical cannabis (Table 5B).

Table 5: Q5—Please indicate your agreement or disagreement with the following statements.

Table 5A: Medical Cannabis is a legitimate medical therapy.

Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
Strongly Agree	13.64%	3	20.00%	3	34.95%	36	33.33%	1	66.67%	6
Agree	50.00%	11	66.67%	10	47.57%	49	66.67%	2	11.11%	1
Neither agree nor disagree	18.18%	4	13.33%	2	13.59%	14	0.00%	0	11.11%	1
Disagree	9.09%	2	0.00%	0	2.91%	3	0.00%	0	0.00%	0
Strongly disagree	9.09%	2	0.00%	0	0.97%	1	0.00%	0	11.11%	1
Total	Total	22	Total	15	Total	103	Total	3	Total	9

Table 5B: Medical providers should be offering medical cannabis for managing medical conditions.

Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
Strongly Agree	9.09%	2	6.67%	1	23.30%	24	33.33%	1	55.56%	5
Agree	9.09%	2	46.67%	7	44.66%	46	33.33%	1	22.22%	2
Neither agree nor disagree	50.00%	11	46.67%	7	24.27%	25	33.33%	1	0.00%	0
Disagree	18.18%	4	0.00%	0	6.80%	7	0.00%	0	11.11%	1
Strongly disagree	13.64%	3	0.00%	0	0.97%	1	0.00%	0	11.11%	1
Total	Total	22	Total	15	Total	103	Total	3	Total	9

Table 5C: Medical cannabis has significant interactions with medical therapies.

Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
Strongly Agree	9.09%	2	20.00%	3	4.85%	5	0.00%	0	0.00%	0
Agree	45.45%	10	33.33%	5	19.42%	20	66.67%	2	33.33%	3
Neither agree nor disagree	31.82%	7	40.00%	6	48.54%	50	33.33%	1	55.56%	5
Disagree	9.09%	2	6.67%	1	22.33%	23	0.00%	0	11.11%	1
Strongly disagree	4.55%	1	0.00%	0	4.85%	5	0.00%	0	0.00%	0
Total	Total	22	Total	15	Total	103	Total	3	Total	9

Table 5D: Medical cannabis can effectively treat symptoms associated with medical conditions.

Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
Strongly Agree	13.64%	3	6.67%	1	30.10%	31	33.33%	1	55.56%	5
Agree	59.09%	13	86.67%	13	51.46%	53	66.67%	2	22.22%	2
Neither agree nor disagree	18.18%	4	6.67%	1	16.50%	17	0.00%	0	11.11%	1
Disagree	4.55%	1	0.00%	0	0.97%	1	0.00%	0	0.00%	0
Strongly disagree	4.55%	1	0.00%	0	0.97%	1	0.00%	0	11.11%	1
Total	Total	22	Total	15	Total	103	Total	3	Total	9

Table 5E: The process to certify patients in medical cannabis program prevents me from enrolling patients.

Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
Strongly Agree	0.00%	0	26.67%	4	1.03%	1	0.00%	0	0.00%	0
Agree	9.09%	2	6.67%	1	5.15%	5	0.00%	0	0.00%	0
Neither agree nor disagree	54.55%	12	46.67%	7	87.63%	85	100.00%	3	88.89%	8
Disagree	18.18%	4	13.33%	2	4.12%	4	0.00%	0	0.00%	0
Strongly disagree	18.18%	4	6.67%	1	2.06%	2	0.00%	0	11.11%	1
Total	Total	22	Total	15	Total	97	Total	3	Total	9

Question six was used to measure awareness of illegal use of medicinal cannabis among patients (Table 6A). The majority of participants either agreed or strongly agreed that patients use medical cannabis illegally to treat symptoms or medical conditions. In fact, 19 (86%) MDs/DOs, 14 (93%) NPs/PAs, and 93 (90%) RNs/LPNs agreed or strongly agreed that they were aware patients used medical cannabis illegally to treat symptoms or medical conditions. However, far fewer participants across all disciplines thought medical cannabis through the state of Montana was safer than marijuana purchased illegally (Table 6B). Finally 14 (63%) MDs/DOs, 12 (80%) NPs/PAs, and 74 (73%) RNS/LPNs believed medical marijuana is safe for pain control when compared to opioids (Table 6C).

Table 6: Q6—Please indicate your agreement or disagreement with the following statements.

Table 6A: I am aware patients use medical cannabis illegally to treat symptoms or medical conditions.

#	Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
1	Strongly agree	54.55%	12	33.33%	5	39.81%	41	33.33%	1	33.33%	3
2	Agree	40.91%	9	60.00%	9	50.49%	52	33.33%	1	55.56%	5
3	Neither agree nor disagree	4.55%	1	0.00%	0	6.80%	7	33.33%	1	11.11%	1
4	Disagree	0.00%	0	6.67%	1	2.91%	3	0.00%	0	0.00%	0
5	Strongly disagree	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0
	Total	Total	22	Total	15	Total	103	Total	3	Total	9

Table 6B: Medical cannabis through the state of Montana is safer than cannabis that the patients use illegally.

#	Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
1	Strongly agree	0.00%	0	13.33%	2	25.49%	26	0.00%	0	11.11%	1
2	Agree	36.36%	8	26.67%	4	28.43%	29	66.67%	2	44.44%	4
3	Neither agree nor disagree	36.36%	8	60.00%	9	40.20%	41	33.33%	1	33.33%	3
4	Disagree	22.73%	5	0.00%	0	4.90%	5	0.00%	0	0.00%	0
5	Strongly disagree	4.55%	1	0.00%	0	0.98%	1	0.00%	0	11.11%	1
	Total	Total	22	Total	15	Total	102	Total	3	Total	9

Table 6C: Medical Cannabis is relatively safe for pain control when compared to opioids.

#	Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
1	Strongly agree	18.18%	4	26.67%	4	33.33%	34	33.33%	1	55.56%	5
2	Agree	45.45%	10	53.33%	8	39.22%	40	33.33%	1	33.33%	3
3	Neither agree nor disagree	22.73%	5	13.33%	2	23.53%	24	33.33%	1	0.00%	0
4	Disagree	9.09%	2	6.67%	1	3.92%	4	0.00%	0	0.00%	0
5	Strongly disagree	4.55%	1	0.00%	0	0.00%	0	0.00%	0	11.11%	1
	Total	Total	22	Total	15	Total	102	Total	3	Total	9

Question seven was used to evaluate the healthcare professionals' opinions and perceptions of the benefits of cannabis for the symptoms of pain (Table 7A), seizures (Table 7B), nausea/vomiting (Table 7C), muscle spasms (Table 7D), anxiety (Table 7E), and depression (Table 7F). The majority of MDs/DOs, NPs/PAs, and RNs/LPNs believed that cannabis was helpful for pain (Table 7A). Interestingly, there is great disparity among all healthcare professionals in the treatment of depression and anxiety. On the whole, healthcare professionals were more apt to believe that cannabis was more helpful for anxiety (Table 7E) than depression (Table 7F), although marijuana was considered a less favorable treatment for depression and anxiety than it was in the treatment of ailments such as seizures (Table 7B) and nausea/vomiting (Table 7C).

Table 7: Q7—How helpful do you think cannabis/marijuana is for the following symptoms?

Table 7A: Pain

#	Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
1	Very Helpful	17.39%	4	31.25%	5	44.66 %	46	66.67%	2	77.78 %	7
2	Somewha t Helpful	69.57%	1 6	62.50%	1 0	43.69 %	45	0.00%	0	11.11 %	1
3	Neither helpful or not helpful	4.35%	1	6.25%	1	0.97%	1	33.33%	1	0.00%	0
4	Somewha t not helpful	0.00%	0	0.00%	0	0.97%	1	0.00%	0	0.00%	0
5	Not helpful at all	8.70%	2	0.00%	0	0.00%	0	0.00%	0	11.11 %	1
6	I don't know	0.00%	0	0.00%	0	9.71%	10	0.00%	0	0.00%	0
	Total	Total	2 3	Total	1 6	Total	10 3	Total	3	Total	9

Table 7B: Seizures

#	Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
1	Very Helpful	8.70%	2	6.67%	1	32.04%	33	33.33%	1	55.56%	5
2	Somewhat Helpful	52.17%	12	46.67%	7	28.16%	29	66.67%	2	0.00%	0
3	Neither helpful or not helpful	8.70%	2	6.67%	1	4.85%	5	0.00%	0	22.22%	2
4	Somewhat not helpful	0.00%	0	6.67%	1	0.97%	1	0.00%	0	0.00%	0
5	Not helpful at all	4.35%	1	0.00%	0	1.94%	2	0.00%	0	11.11%	1
6	I don't know	26.09%	6	33.33%	5	32.04%	33	0.00%	0	11.11%	1
	Total	Total	23	Total	15	Total	103	Total	3	Total	9

Table 7C: Nausea and/or vomiting

#	Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
1	Very Helpful	8.70%	2	31.25%	5	38.83%	40	66.67%	2	44.44%	4
2	Somewhat Helpful	73.91%	17	62.50%	10	38.83%	40	33.33%	1	22.22%	2
3	Neither helpful or not helpful	0.00%	0	6.25%	1	5.83%	6	0.00%	0	11.11%	1
4	Somewhat not helpful	8.70%	2	0.00%	0	4.85%	5	0.00%	0	0.00%	0
5	Not helpful at all	4.35%	1	0.00%	0	1.94%	2	0.00%	0	11.11%	1
6	I don't know	4.35%	1	0.00%	0	9.71%	10	0.00%	0	11.11%	1
	Total	Total	23	Total	16	Total	103	Total	3	Total	9

Table 7D: Muscle spasms

#	Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
1	Very Helpful	4.35%	1	0.00%	0	22.55%	23	33.33%	1	55.56%	5
2	Somewhat Helpful	34.78%	8	53.33%	8	30.39%	31	33.33%	1	22.22%	2
3	Neither helpful or not helpful	21.74%	5	6.67%	1	9.80%	10	33.33%	1	11.11%	1
4	Somewhat not helpful	0.00%	0	0.00%	0	0.98%	1	0.00%	0	0.00%	0
5	Not helpful at all	17.39%	4	6.67%	1	0.00%	0	0.00%	0	11.11%	1
6	I don't know	21.74%	5	33.33%	5	36.27%	37	0.00%	0	0.00%	0
	Total	Total	23	Total	15	Total	102	Total	3	Total	9

Table 7E: Anxiety

#	Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
1	Very Helpful	4.35%	1	6.67%	1	30.10 %	31	33.33%	1	33.33 %	3
2	Somewha t Helpful	52.17%	1 2	26.67%	4	39.81 %	41	33.33%	1	33.33 %	3
3	Neither helpful or not helpful	8.70%	2	6.67%	1	9.71%	10	33.33%	1	11.11 %	1
4	Somewha t not helpful	17.39%	4	20.00%	3	5.83%	6	0.00%	0	0.00%	0
5	Not helpful at all	17.39%	4	20.00%	3	2.91%	3	0.00%	0	11.11 %	1
6	I don't know	0.00%	0	20.00%	3	11.65 %	12	0.00%	0	11.11 %	1
	Total	Total	2 3	Total	1 5	Total	10 3	Total	3	Total	9

Table 7F: Depression

#	Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
1	Very Helpful	0.00%	0	0.00%	0	16.50%	17	33.33%	1	22.22%	2
2	Somewhat Helpful	30.43%	7	6.67%	1	21.36%	22	0.00%	0	11.11%	1
3	Neither helpful or not helpful	21.74%	5	13.33%	2	18.45%	19	66.67%	2	22.22%	2
4	Somewhat not helpful	17.39%	4	20.00%	3	9.71%	10	0.00%	0	11.11%	1
5	Not helpful at all	26.09%	6	33.33%	5	7.77%	8	0.00%	0	22.22%	2
6	I don't know	4.35%	1	26.67%	4	26.21%	27	0.00%	0	11.11%	1
	Total	Total	23	Total	15	Total	103	Total	3	Total	9

Question eight was used for the evaluation of healthcare professionals' perceptions of cannabinoids in the treatment of a variety of different conditions. The conditions were selected from the list on the MMMP website. Healthcare professionals across all disciplines believed that cannabinoids were helpful for the treatment of cancer-associated symptoms of pain and wasting syndrome (Table 8A). We see more discrepancy and hesitancy when asking about other ailments. For example, over one-third of all MDs/DOs (35%), NP/PAs (50%), and RNs/LPNs (46%) marked that they did not know if cannabis was helpful or not helpful for the treatment of glaucoma. A similar trend of marking "don't know" can be seen across all disciplines when asked about HIV/AIDS (Table 8C). When asked about Tourette syndrome (Table 8D), ALS (Table

Table 8B: Glaucoma

#	Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
1	Very helpful	17.39%	4	14.29%	2	18.63%	19	33.33%	1	22.22%	2
2	Somewha t helpful	30.43%	7	7.14%	1	19.61%	20	0.00%	0	33.33%	3
3	Neither helpful nor not helpful	8.70%	2	21.43%	3	13.73%	14	33.33%	1	11.11%	1
4	Somewha t not helpful	0.00%	0	7.14%	1	0.98%	1	0.00%	0	0.00%	0
5	Not helpful at all	8.70%	2	0.00%	0	0.98%	1	0.00%	0	11.11%	1
6	Don't know	34.78%	8	50.00%	7	46.08%	47	33.33%	1	22.22%	2
	Total	Total	23	Total	14	Total	102	Total	3	Total	9

Table 8C: HIV/AIDS

#	Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
1	Very helpful	4.35%	1	13.33%	2	17.65%	18	0.00%	0	0.00%	0
2	Somewha t helpful	26.09%	6	20.00%	3	14.71%	15	33.33%	1	33.33%	3
3	Neither helpful nor not helpful	17.39%	4	26.67%	4	13.73%	14	33.33%	1	22.22%	2
4	Somewha t not helpful	0.00%	0	6.67%	1	2.94%	3	0.00%	0	0.00%	0
5	Not helpful at all	8.70%	2	0.00%	0	4.90%	5	0.00%	0	11.11%	1
6	Don't know	43.48%	10	33.33%	5	46.08%	47	33.33%	1	33.33%	3
	Total	Total	23	Total	15	Total	102	Total	3	Total	9

Table 8 D: Tourette syndrome

#	Question	Provider (MD/DO)	Provide r (NP/PA)	RN or LPN	Pharmacis t	Other					
1	Very helpful	0.00%	0	0.00%	0	16.67% 17	33.33%	1	33.33% 3		
2	Somewha t helpful	17.39%	4	26.67%	4	18.63% 19	0.00%	0	0.00%	0	
3	Neither helpful nor not helpful	21.74%	5	13.33%	2	8.82% 9	33.33%	1	22.22% 2		
4	Somewha t not helpful	0.00%	0	0.00%	0	0.98% 1	0.00%	0	0.00%	0	
5	Not helpful at all	4.35%	1	0.00%	0	0.98% 1	0.00%	0	11.11% 1		
6	Don't know	56.52%	1 3	60.00%	9	53.92% 55	33.33%	1	33.33% 3		
	Total	Total	2 3	Total	1 5	Total	10 2	Total	3	Total	9

Table 8E: Amyotrophic Lateral Sclerosis (ALS)

#	Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
1	Very helpful	4.35%	1	6.67%	1	16.67%	17	66.67%	2	22.22%	2
2	Somewhat helpful	17.39%	4	13.33%	2	18.63%	19	0.00%	0	33.33%	3
3	Neither helpful nor not helpful	17.39%	4	20.00%	3	10.78%	11	33.33%	1	11.11%	1
4	Somewhat not helpful	0.00%	0	0.00%	0	1.96%	2	0.00%	0	0.00%	0
5	Not helpful at all	8.70%	2	0.00%	0	0.98%	1	0.00%	0	11.11%	1
6	Don't know	52.17%	12	60.00%	9	50.98%	52	0.00%	0	22.22%	2
	Total	Total	23	Total	15	Total	102	Total	3	Total	9

Table 8F: Seizures, including those characteristic of epilepsy

#	Question	Provider (MD/DO)	Provide r (NP/PA)	RN or LPN	Pharmacis t	Other					
1	Very helpful	4.35%	1	12.50%	2	32.35% 33	33.33%	1	44.44% 4		
2	Somewha t helpful	56.52%	1 3	37.50%	6	26.47% 27	66.67%	2	11.11% 1		
3	Neither helpful nor not helpful	0.00%	0	12.50%	2	0.98% 1	0.00%	0	22.22% 2		
4	Somewha t not helpful	4.35%	1	6.25%	1	1.96% 2	0.00%	0	0.00% 0		
5	Not helpful at all	8.70%	2	0.00%	0	0.98% 1	0.00%	0	11.11% 1		
6	Don't know	26.09%	6	31.25%	5	37.25% 38	0.00%	0	11.11% 1		
	Total	Total	2 3	Total	1 6	Total	10 2	Total	3	Total	9

Table 8G: Severe and persistent muscle spasms, including those characteristic of multiple sclerosis

#	Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
1	Very helpful	0.00%	0	6.67%	1	26.73%	27	33.33%	1	66.67%	6
2	Somewhat helpful	56.52%	13	46.67%	7	25.74%	26	66.67%	2	11.11%	1
3	Neither helpful nor not helpful	13.04%	3	6.67%	1	5.94%	6	0.00%	0	11.11%	1
4	Somewhat not helpful	8.70%	2	0.00%	0	0.99%	1	0.00%	0	0.00%	0
5	Not helpful at all	4.35%	1	0.00%	0	0.99%	1	0.00%	0	11.11%	1
6	Don't know	17.39%	4	40.00%	6	39.60%	40	0.00%	0	0.00%	0
	Total	Total	23	Total	15	Total	101	Total	3	Total	9

Table 8H: Inflammatory bowel disease, including Crohn's disease

#	Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
1	Very helpful	0.00%	0	0.00%	0	15.84%	16	33.33%	1	22.22%	2
2	Somewhat helpful	13.04%	3	20.00%	3	10.89%	11	0.00%	0	22.22%	2
3	Neither helpful nor not helpful	13.04%	3	20.00%	3	15.84%	16	33.33%	1	22.22%	2
4	Somewhat not helpful	8.70%	2	6.67%	1	2.97%	3	0.00%	0	0.00%	0
5	Not helpful at all	13.04%	3	0.00%	0	2.97%	3	0.00%	0	11.11%	1
6	Don't know	52.17%	12	53.33%	8	51.49%	52	33.33%	1	22.22%	2
	Total	Total	23	Total	15	Total	101	Total	3	Total	9

Table 8-I Terminal illness, with a probable life expectancy of less than one year

#	Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
1	Very helpful	39.13%	9	25.00%	4	61.39%	62	66.67%	2	66.67%	6
2	Somewhat helpful	39.13%	9	31.25%	5	17.82%	18	0.00%	0	11.11%	1
3	Neither helpful nor not helpful	4.35%	1	12.50%	2	3.96%	4	33.33%	1	11.11%	1
4	Somewhat not helpful	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0
5	Not helpful at all	8.70%	2	0.00%	0	0.99%	1	0.00%	0	11.11%	1
6	Don't know	8.70%	2	31.25%	5	15.84%	16	0.00%	0	0.00%	0
	Total	Total	23	Total	16	Total	101	Total	3	Total	9

Question nine was used to evaluate perceptions of risk for morbidity with use of cannabinoids. In this question, we see that the majority of healthcare professionals agree that cannabis increases the risk for psychotic symptoms (Table 9A), depression (Table 9B), and cognitive decline (Table 9 F) in varying degrees (either “a lot,” “somewhat,” or a “little bit”). Fifteen (65%) MDs/DOs said that cannabinoids increase the risk for memory problems at least “somewhat” or “a lot,” while six (42%) NPs/PAs said they did not know if cannabinoid use increased risk for memory problems (Table 9C).

Table 9: Q9 - To what extent do you think cannabinoids increase the risk for:

Table 9A: Psychotic symptoms

#	Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
1	A lot	21.74%	5	20.00%	3	12.87 %	13	0.00%	0	11.11 %	1
2	Somewha t	39.13%	9	6.67%	1	26.73 %	27	66.67%	2	11.11 %	1
3	A little	21.74%	5	20.00%	3	18.81 %	19	0.00%	0	22.22 %	2
4	Not at all	8.70%	2	13.33%	2	15.84 %	16	33.33%	1	11.11 %	1
5	Don't know	8.70%	2	40.00%	6	25.74 %	26	0.00%	0	44.44 %	4
	Total	Total	2 3	Total	1 5	Total	10 1	Total	3	Total	9

Table 9 B: Depression

#	Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
1	A lot	17.39%	4	6.67%	1	11.88 %	12	0.00%	0	22.22 %	2
2	Somewha t	34.78%	8	33.33%	5	21.78 %	22	66.67%	2	11.11 %	1
3	A little	26.09%	6	20.00%	3	21.78 %	22	0.00%	0	22.22 %	2
4	Not at all	4.35%	1	0.00%	0	18.81 %	19	33.33%	1	0.00%	0
5	Don't know	17.39%	4	40.00%	6	25.74 %	26	0.00%	0	44.44 %	4
	Total	Total	2 3	Total	1 5	Total	10 1	Total	3	Total	9

Table 9C: Memory problems

#	Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
1	A lot	30.43%	7	7.14%	1	14.85 %	15	0.00%	0	11.11 %	1
2	Somewha t	34.78%	8	28.57%	4	30.69 %	31	100.00%	3	0.00%	0
3	A little	26.09%	6	14.29%	2	28.71 %	29	0.00%	0	33.33 %	3
4	Not at all	0.00%	0	7.14%	1	6.93%	7	0.00%	0	11.11 %	1
5	Don't know	8.70%	2	42.86%	6	18.81 %	19	0.00%	0	44.44 %	4
	Total	Total	2 3	Total	1 4	Total	10 1	Total	3	Total	9

Table 9D: Respiratory symptoms

#	Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
1	A lot	8.70%	2	6.67%	1	7.92%	8	33.33%	1	11.11 %	1
2	Somewha t	47.83%	1 1	20.00%	3	38.61 %	39	33.33%	1	33.33 %	3
3	A little	26.09%	6	13.33%	2	15.84 %	16	33.33%	1	22.22 %	2
4	Not at all	17.39%	4	13.33%	2	12.87 %	13	0.00%	0	0.00%	0
5	Don't know	0.00%	0	46.67%	7	24.75 %	25	0.00%	0	33.33 %	3
	Total	Total	2 3	Total	1 5	Total	10 1	Total	3	Total	9

Table 9E: Accidents

#	Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
1	A lot	17.39%	4	6.67%	1	15.84%	16	33.33%	1	22.22%	2
2	Somewhat	34.78%	8	20.00%	3	23.76%	24	33.33%	1	0.00%	0
3	A little	47.83%	11	20.00%	3	30.69%	31	33.33%	1	33.33%	3
4	Not at all	0.00%	0	6.67%	1	9.90%	10	0.00%	0	0.00%	0
5	Don't know	0.00%	0	46.67%	7	19.80%	20	0.00%	0	44.44%	4
	Total	Total	23	Total	15	Total	101	Total	3	Total	9

Table 9F: Cognitive decline

#	Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
1	A lot	26.09%	6	6.67%	1	14.85%	15	0.00%	0	11.11%	1
2	Somewhat	30.43%	7	26.67%	4	17.82%	18	33.33%	1	0.00%	0
3	A little	21.74%	5	20.00%	3	14.85%	15	66.67%	2	0.00%	0
4	Not at all	4.35%	1	13.33%	2	14.85%	15	0.00%	0	22.22%	2
5	Don't know	17.39%	4	33.33%	5	37.62%	38	0.00%	0	66.67%	6
	Total	Total	23	Total	15	Total	101	Total	3	Total	9

Table 9G: Cyclic vomiting

#	Question	Provider (MD/DO)	Provide r (NP/PA)	RN or LPN	Pharmacis t	Other					
1	A lot	43.48%	10	6.67%	1	19.80%	20	0.00%	0	11.11%	1
2	Somewha t	17.39%	4	20.00%	3	19.80%	20	0.00%	0	11.11%	1
3	A little	21.74%	5	13.33%	2	13.86%	14	0.00%	0	0.00%	0
4	Not at all	8.70%	2	26.67%	4	21.78%	22	66.67%	2	33.33%	3
5	Don't know	8.70%	2	33.33%	5	24.75%	25	33.33%	1	44.44%	4
	Total	Total	23	Total	15	Total	101	Total	3	Total	9

Question 10 was used to measure participants' perceptions of cannabinoids on quality-of-life measures. The majority of MDs/DOs (78%), NPs/PAs (69%), and RNs/LPNs (72%) believed that cannabinoids improve physical functioning at least a little bit (Table 10A). However, a large portion of participants believed that cannabinoids caused no improvement in energy level (Table 10B). There was greater variability in healthcare professionals' responses to mood (Table 10C), enjoyment of life (Table 10D), social engagement (Table 10E), ability to work (Table 10F), and sense of hope (Table 10G).

Table 10: Q10—To what extent can cannabinoids improve the following for patients?

Table 10A: Physical functioning

Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
A great improvement	0.00%	0	6.25%	1	13.86 %	14	33.33%	1	44.44 %	4
Improvement	39.13%	9	37.50%	6	36.63 %	37	33.33%	1	0.00%	0
Small improvement	39.13%	9	25.00%	4	21.78 %	22	33.33%	1	22.22 %	2
None at all	13.04%	3	0.00%	0	6.93%	7	0.00%	0	11.11 %	1
Don't know	8.70%	2	31.25%	5	20.79 %	21	0.00%	0	22.22 %	2
Total	Total	2 3	Total	1 6	Total	10 1	Total	3	Total	9

Table 10B: Energy level

Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
A great improvement	0.00%	0	0.00%	0	10.00 %	10	0.00%	0	33.33 %	3
Improvement	8.70%	2	26.67%	4	10.00 %	10	33.33%	1	11.11 %	1
Small improvement	34.78%	8	6.67%	1	29.00 %	29	66.67%	2	22.22 %	2
None at all	43.48%	1 0	33.33%	5	25.00 %	25	0.00%	0	11.11 %	1
Don't know	13.04%	3	33.33%	5	26.00 %	26	0.00%	0	22.22 %	2
Total	Total	2 3	Total	1 5	Total	10 0	Total	3	Total	9

Table 10C: Mood

Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
A great improvement	4.35%	1	0.00%	0	18.81 %	19	50.00%	1	37.50 %	3
Improvement	26.09%	6	33.33%	5	38.61 %	39	0.00%	0	25.00 %	2
Small improvement	43.48%	10	33.33%	5	20.79 %	21	50.00%	1	0.00%	0
None at all	17.39%	4	0.00%	0	3.96%	4	0.00%	0	12.50 %	1
Don't know	8.70%	2	33.33%	5	17.82 %	18	0.00%	0	25.00 %	2
Total	Total	23	Total	15	Total	101	Total	2	Total	8

Table 10D: Enjoyment of life

Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
A great improvement	4.35%	1	6.25%	1	18.81 %	19	33.33%	1	55.56 %	5
Improvement	39.13%	9	43.75%	7	43.56 %	44	33.33%	1	22.22 %	2
Small improvement	39.13%	9	18.75%	3	13.86 %	14	33.33%	1	0.00%	0
None at all	8.70%	2	0.00%	0	4.95%	5	0.00%	0	11.11 %	1
Don't know	8.70%	2	31.25%	5	18.81 %	19	0.00%	0	11.11 %	1
Total	Total	23	Total	16	Total	101	Total	3	Total	9

Table 10E: Social engagement (visiting with friends and family)

Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
A great improvement	4.35%	1	6.67%	1	17.00%	17	33.33%	1	55.56%	5
Improvement	13.04%	3	40.00%	6	29.00%	29	0.00%	0	22.22%	2
Small improvement	47.83%	11	13.33%	2	19.00%	19	66.67%	2	0.00%	0
None at all	21.74%	5	0.00%	0	11.00%	11	0.00%	0	11.11%	1
Don't know	13.04%	3	40.00%	6	24.00%	24	0.00%	0	11.11%	1
Total	Total	23	Total	15	Total	100	Total	3	Total	9

Table 10F: Ability to work

Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
A great improvement	4.35%	1	0.00%	0	11.11%	11	0.00%	0	44.44%	4
Improvement	17.39%	4	31.25%	5	14.14%	14	33.33%	1	22.22%	2
Small improvement	26.09%	6	12.50%	2	19.19%	19	33.33%	1	11.11%	1
None at all	34.78%	8	6.25%	1	26.26%	26	33.33%	1	11.11%	1
Don't know	17.39%	4	50.00%	8	29.29%	29	0.00%	0	11.11%	1
Total	Total	23	Total	16	Total	99	Total	3	Total	9

Table 10G: Sense of hope

Question	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
A great improvement	4.35%	1	0.00%	0	13.00 %	13	33.33%	1	55.56 %	5
Improvement	17.39%	4	35.71%	5	35.00 %	35	33.33%	1	33.33 %	3
Small improvement	34.78%	8	7.14%	1	21.00 %	21	33.33%	1	0.00%	0
None at all	21.74%	5	7.14%	1	6.00%	6	0.00%	0	11.11 %	1
Don't know	21.74%	5	50.00%	7	25.00 %	25	0.00%	0	0.00%	0
Total	Total	23	Total	14	Total	100	Total	3	Total	9

In Table 11, participants were asked how prepared they feel answering patient questions about medical marijuana. The majority of NPs/PAs (75%) and RNs/LPNs (71%) felt they were not prepared to answer questions about medical cannabis. In table 12, we asked if participants were interested in learning more about medical marijuana. The majority of participants (MD/DOs [61%], NPs/PAs [100%], and RNs/LPNs [84%]) reported that they were interested in learning more about medical cannabis.

Table 11: Q11—How prepared are you to answer patient questions about medical marijuana or medical cannabis?

#	Question	Provider (MD/DO)	Provider (NP/PA)	RN or LPN	Pharmacist	Other
1	very prepared	13.04% 3	0.00% 0	5.94% 6	0.00% 0	11.11% 1
2	somewhat prepared	56.52% 13	25.00% 4	19.80% 20	33.33% 1	0.00% 0
3	Not prepared	30.43% 7	75.00% 12	50.50% 51	33.33% 1	44.44% 4
4	None at all	0.00% 0	0.00% 0	20.79% 21	33.33% 1	0.00% 0
5	I do not want to answer questions about medical marijuana or cannabis	0.00% 0	0.00% 0	2.97% 3	0.00% 0	44.44% 4
	Total	Total 23	Total 15	Total 101	Total 3	Total 9

Table 12: Q12—Would you be interested in learning more about medical marijuana or medical cannabis?

Question	Provider (MD/DO)	Provider (NP/PA)	RN or LPN	Pharmacist	Other
Yes	60.87% 14	100.00% 15	84.16% 85	100.00% 3	77.78% 7
No	39.13% 9	0.00% 0	15.84% 16	0.00% 0	22.22% 2
N=	Total 23	Total 15	Total 101	Total 3	Total 9

In question 13, participants were asked if they support the de-scheduling of Medical Marijuana in order for the development of more research around the risks and benefits. The majority of participants (70% of MDs/DOs, 80% of NPs/Pas, and 78% of

RNs/LPNs) marked that they do support the de-scheduling of marijuana (Table 13). In table 14, we see the specialties of the participants, with most indicating family medicine or internal medicine, while in table 15, we see the years of experience that participants have in their professions. There was great variability in the years of experience among the participants.

Table 13: Q13—Do you support the de-scheduling of Medical Marijuana in order for the development of more research around the risks and benefits?

Question	Provider (MD/DO)		Provider (NP/PA)		RN or LPN		Pharmacist		Other	
Yes	69.57%	16	80.00%	12	78.00%	78	100.00%	3	100.00%	9
No	21.74%	5	13.33%	2	8.00%	8	0.00%	0	0.00%	0
Prefer not to answer	8.70%	2	6.67%	1	14.00%	14	0.00%	0	0.00%	0
Total	Total	23	Total	15	Total	100	Total	3	Total	9

Table 14: Q14—What is your specialty?

	Provider (MD/DO)		Provide r (NP/PA)		RN or LPN		Pharmacis t		Other	
Emergency/Urgent care	4.3%	1	12.5%	2	6.8%	7				
Internal medicine/Inpatient medicine	43.5%	10	6.25%	1	16.5%	17	33.33%	1		
Pediatrics	8.6%	2		0	4.9%	5				
Oncology		0		0	6.8%	7	66.66%	2	22.2%	2
Family Med	17.4%	4	18.75%	3	2.9%	3				
Surgical	4.3%	1		0	7.8%	8				
Other	8.6%	2	31.25%	5	35%	36			33.3%	3
Did not answer	13.0%	3	31.25%	5	19.4%	20			44.4%	4
Total		23		16		103		3		9

Table 15: Q15—How many years have you been in practice?

	Provider (MD/DO)		Provider (NP/PA)		RN or LPN	
0-5 years	17.4%	4	6.25%	1	31.1%	32
6-10 years	17.4%	4	37.5%	6	20.3%	21
11-15 years	17.4%	4	6.25%	1	11.7%	12
16-20 years	21.7%	5		0	5.9%	6
20+ years	21.7%	5	25%	4	19.4%	20
Did not answer	4.3%	1	25%	4	11.6%	12
Total		23		16		103

Educational Opportunity

An educational opportunity (Lunch and Learn) was provided to all the employees of Bozeman Health. This opportunity was offered at noon on October 25, 2019. Fifty healthcare professionals attended this educational opportunity, including one pharmacist and two social workers. No providers (MD, DOs, NPs, or PAs) attended the Lunch and Learn. The educational opportunity, outlined the information in the data analysis portion of this paper, was 50 minutes in length with 10 minutes allowed for questions for a total 60-minute presentation. Attendees were asked to sign in with their email to receive the post-test in accordance with this project. Most questions were the same as the pre-test questions with additional items added to evaluate if participants completed the pre-test survey and if they felt more prepared to discuss medical marijuana with patients.

Post-test Results

The post-test was emailed to all 50 attendees and, of those, 20 healthcare professionals (19 registered nurses and one social worker) responded to the post-test. Out of 12 (60%) of those who participated in the pre-test survey, eight (40%) did not participate in the post-test survey. Eighteen (90%) believed that cannabis is a legitimate medical therapy. Twelve (60%) believed providers should be offering medical cannabis for managing medical conditions. Seventeen (85%) believed medical cannabis can effectively treat symptoms associated with medical conditions. Nineteen (95%) believed that medical cannabis is helpful for pain and 18 (80%) believed it is helpful for seizures. All 20 (100%) believed medical cannabis was helpful with cancer-associated symptoms

of severe/chronic pain, nausea, severe vomiting, or cachexia or severe wasting. Seventeen (85%) supported the de-scheduling of medical marijuana for the development of more research around related risks and benefits. Of those who participated in the post-test, 12 (60%) said they felt more comfortable discussing medical marijuana with patients after the educational opportunity, five (25%) said they did not feel more comfortable, and three (15%) said they did not know if they felt more comfortable after the educational opportunity.

CHAPTER FIVE

DISCUSSION

There were three principle aims in this project. First, to determine the perceptions of medical marijuana and medical marijuana users among healthcare professionals (licensed practical nurses [LPNs], registered nurses [RNs], nurse practitioners [NPs], medical doctors [MDs], doctors of osteopathic medicine [DOs], and physician assistants [PAs]). The primary survey was assessed to determine the overall perceptions among healthcare professionals. The majority of those who participated in the survey viewed medical marijuana as a legitimate therapy. This is consistent with the findings from the original survey in Philpot et al. (2019). However, very few medical professionals felt they were prepared to discuss medical marijuana with patients. In fact, the majority of NPs/PAs and RNs said they did not feel comfortable discussing medical marijuana with patients. With the growing number of users in the Gallatin valley, it will be essential that those who work in patient-care areas are able to bring clarity to patients who may be curious about the use of medical cannabis. However, in order to fully prepare patients, more research is needed, specifically surrounding the longitudinal effects of the chronic use of cannabis. Interestingly, the general, positive favorability among healthcare professionals may allow for the anticipated change in the utilization of medical cannabis for patients with palliative-care needs.

The second aim of this project was to deliver an educational opportunity among healthcare employees pertaining to the current, relevant literature and evidence

surrounding medical marijuana and cannabis research. A total of 50 BHDH employees attended the educational opportunity provided. The attendance for this Lunch and Learn surrounding medical cannabis had the highest attendance of 2019 in the BHDH organization. As previously stated, this may contribute to the fact that many individuals feel unprepared to discuss medical cannabis use.

The final aim of this scholarly project was to determine if exposure to current research (as a result of the educational opportunity delivered) would be sufficient in increasing comfort in discussing medical cannabis use with patients. Within this small sample size of individuals, it would appear the educational opportunity allowed for 60% of the participants to feel more comfortable when discussing medical marijuana. However, more research and ongoing education of healthcare professionals is needed in order to fully assess the medicinal properties of cannabis.

Limitations

The validity and reliability of this questionnaire, which was used in the pretest and post-test, were previously pilot-tested by the original researchers (Philpot et al., 2019). However, this design differed in that it accounted for the responses from multidisciplinary personnel at a small rural hospital versus a metropolitan large organization. Furthermore, this survey was previously used in the primary-care setting while this project sent the survey to all specialties within the BHDH organization. Many of the questions were in Likert-scale format. The middle spot of the Likert-scale is often problematic as it sometimes adds confusion to the question, some respondents will think of it as neutral as others may not feel they have enough information (Cooper & Johnson,

2016). In an effort to remedy this well-known issue, the option “don’t know” was added to the Likert-like questions. It also must be noted that the topic surrounding this survey could possibly serve as a limitation to the project itself. As demonstrated, the topic of medical cannabis is polarizing and some individuals who were asked to respond to this emailed survey may have felt the researcher did not provide adequate reassurance in regard to anonymity from administration at the BHDH organization. This may have discouraged participants and could have influenced answers to questions overall.

Implications for Practice

With the overwhelming shift in the sociopolitical atmosphere, healthcare workers have an obligation to their patients to know and understand the risks and utility of medicinal cannabis usage. The future of medicinal cannabis is complex, and more research is desperately needed in order to help guide healthcare professionals and patients about the true utility of medicinal cannabis use. Furthermore, additional studies are needed in order to fully understand the full measures of risks and benefits of medicinal cannabis. However, there is existing research that may help guide the healthcare professional at this current time. Research surrounding the endocannabinoid system can be applied to patient care and general pharmacological principles, which may allow for furtherance of education delivered to healthcare professionals. This project demonstrated that the majority of healthcare professionals are interested in obtaining more education on medical marijuana. Therefore, it will be incumbent upon leadership in healthcare to provide information and guidance for those interested.

DNP Core Essentials

Scientific Underpinnings for Practice

The scholarly project used the Social Cognitive Theory (SCT) as the foundation and guiding principle. SCT is unique in its examination of social influence and external and internal social reinforcements. SCT postulates that learning occurs through social and reciprocal interactions of the person, environment, and behavior (LaMorte, 2018). The use of SCT was appropriate in the evaluation of healthcare professionals' perceptions of the utility of medical marijuana and provided the necessary framework.

Organizational and Systems Leadership for Quality Improvement

The DNP student assumed the leadership role for this project. As one of the DNP core essentials, leadership is instrumental in the care of patients and the improvement of delivery in patient care. By identifying the issue of increased use of medical marijuana among patients and the lack of knowledge and preparedness healthcare professionals feel discussing medical marijuana, the DNP student was able to implement a plan to deliver information and prepare peers and future colleagues. Guidance and support was provided to the DNP student by the committee and chair when required.

Clinical Scholarship and Analytical Models for Evidence-Based Practice

The DNP student was able to assess epidemiological, sociopolitical, occupational, and organizational forces in the development, implementation, and evaluation of this project in order to facilitate a need in public health and the population. By providing a

live educational opportunity for staff who care for patients who use medical marijuana, the DNP student was able to empower staff to deliver the proper information to the patients who demonstrate interest in medical marijuana.

Information Systems/Technology for the Improvement and Transformation of Health Care

Multiple information systems and technology were used in order to implement this project. First, the utilization of internet libraries began in the early phases of this project and continued to the final drafting phase of this project. The surveys were performed by the internet-based survey platform, Qualtrics. Qualtrics was also utilized in the organization of this data. Finally, Microsoft PowerPoint (PPT)® was used in the delivery of the live educational opportunity.

Healthcare Policy for Advocacy in Health Care

The design of this project focused on the epidemiological and sociopolitical atmosphere surrounding the utilization of medical marijuana. Through the assessment of the perceptions of healthcare professionals and the evaluation of the policy and legality of the medical marijuana evolution, the DNP student was able to create an ethically responsible educational design that catered to the knowledge deficit of a workforce whom need to remain abreast of the evolving data surrounding a medical measure that is heavily utilized and simultaneously marginalized.

Interprofessional Collaboration for Improving Patient and Population Health Outcomes

This project focused on the leadership of the DNP student to enact effective communication across the interprofessional paradigm in the organization at BHDH. By assessing the perceptions and attitudes, the student was able to assess gaps in the knowledge base and attempted to remedy those gaps through a learning opportunity. This was all done to facilitate and improve the delivery of health care for patients with palliative-care needs.

Clinical Prevention and Population Health for Improving the Nation's Health

The DNP student was able to analyze complex healthcare systems and assess the strengths and weaknesses in the delivery of palliative care across the nation. Through the evaluation of epidemiological data, the student could identify trends in the sociopolitical atmosphere. These trends were then related to the inconsistent delivery of palliative measures across the nation, and then served as a foundation in the assessment of the knowledge base among an interdisciplinary healthcare team.

Advanced Nursing Practice

Finally, the DNP student was able to advocate for healthcare policy by developing and implementing a project that would cater to the education of a workforce. This education was formatted with the idea that healthcare professionals must remain abreast of alternative palliative measures in the setting of opioid abuse and misuse. The project was focused on the aims of social justice and equality in autonomy among patients who

desire alternative methods of therapy in chronic conditions that require palliative measures.

CHAPTER SIX

CONCLUSION

This DNP scholarly project served as a tool for the graduate student to implement the DNP core essentials of translating evidence-based literature into practice. While the idea of medical cannabis in palliative care is over 5000 years old, the concepts of delivery and attainment are in a state of flux. Thus, it is of tremendous import that the DNP-prepared-APRN is able to evaluate and implement evidence-based practice in guiding patients in an ethically responsible manner. In the future, the process of building this project will assist the DNP-prepared-APRN in the assessment, research, and educational design of evidence for overall improvement in the healthcare delivery system and patient care.

Nursing is one of the most trusted occupations in the United States. Therefore, it is necessary that the nurse be able to navigate the complex sociopolitical atmosphere of medical marijuana in an ethically sound and responsible manner. When doing this through the DNP lens, the Social Cognitive Theory (SCT) provides the best approach. The central tenet of SCT is that there is a reciprocal relationship among environment, people, and behavior (Glanz et al., 2002). The SCT underpinning of this project was beneficial in order to understand the relationship between the sociopolitical atmosphere of medical marijuana and the practice or behavior of healthcare professionals. It aimed at understanding previous experiences with marijuana (people) and attitudes and

perceptions of medical marijuana as an intervention for palliative care (behavior) among healthcare professionals in a sociopolitical atmosphere that is evolving (environment).

The project demonstrated that a majority of healthcare professionals agree that medical cannabis is a legitimate therapy, despite not feeling prepared to answer questions about medical marijuana. Also observed was that a majority of healthcare professionals would be interested in learning more about medical marijuana and that, in some instances, nurses feel more prepared to answer questions after having some education on the subject. This is important to understand as healthcare professionals navigate the evolving policy around medicinal cannabis use.

Of greatest import is the continual evaluation and research development in the longitudinal studies of medical cannabis. For a treatment that has been around for over 4000 years, we are sorely behind on research and evidence of treatment. Furthermore, we lack treatment and dosing guidelines in the treatment of patients for palliative care. Only through the development of more research will healthcare professionals ever feel truly equipped to answer questions about medical cannabis.

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APPENDICES

APPENDIX A

ORIGINAL SURVEY

4800 EBBERT

Q1

Provider Cannabis Survey

We appreciate your interest in completing the following survey. We are interested in the thoughts and beliefs that providers have about cannabis in medical practice.

Please review the following definitions which will help you in completing the survey.

Cannabinoids are substances coming from the plants *Cannabis sativa* or *Cannabis indica* (also known as “marijuana”) and are used for medical purposes or recreationally.

Medical cannabis refers to cannabinoids being made available through licensed medical centers only to individuals who have a doctor’s recommendation to possess and use cannabinoids to treat a medical condition.

Are you registered to certify patients for medical cannabis in the Minnesota Cannabis Program?

- Yes (1)
- No (2)

Q2

Have you ever certified a patient for the Minnesota Cannabis Program?

- Yes (1)
 - No (2)
-

Display This Question: If Q2 = No

Q3

Do you have any patients who have been certified?

Yes (1)

No (2)

Display This Question: If Q2 = Yes

Q4

Approximately how many patients have you certified?

_____ patients certified (1)

Q5

Please indicate your agreement or disagreement with the following statements.

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
Medical cannabis is a legitimate medical therapy. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical providers should be offering medical cannabis for managing medical conditions. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical cannabis has significant interactions with medical therapies. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical cannabis can effectively treat symptoms associated with medical conditions. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The process to certify patients in the medical cannabis program prevents me from enrolling patients. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am aware that patients use cannabis illegally to treat symptoms or medical conditions. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical cannabis through the state of Minnesota is safer than cannabis that patients use illegally. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical cannabis through the state of Minnesota is more effective than cannabis that patients use illegally. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q6

How helpful do you think cannabinoids are for the following symptoms:

	Very helpful (1)	Somewhat helpful (2)	Neither helpful nor not helpful (3)	Somewhat not helpful (4)	Not at all helpful (5)	Don't know (6)
Pain (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seizures (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nausea and/or vomiting (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Muscle spasms (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anxiety (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depression (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sleeplessness (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weight loss (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tics (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Post-Traumatic Stress Disorder (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obstructive Sleep apnea (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Autism (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q8

To what extent do you think cannabinoids increase the risk for:

	A lot (1)	Somewhat (2)	A little (3)	Not at all (4)	Don't know (5)
Psychotic symptoms (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depression (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Memory problems (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Respiratory symptoms (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accidents (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Low birth weight (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9

To what extent can cannabinoids improve the following for patients:

	A great deal (1)	Quite a bit (2)	Somewhat (3)	Very little (4)	Not at all (5)	Don't know (6)
Physical functioning (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Energy level (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mood (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enjoyment of life (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social engagement (visiting with friends and family) (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to work (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sense of hope (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q10

How prepared are you to answer patient questions about medical cannabis?

- A great deal (1)
 - Quite a bit (2)
 - Somewhat (3)
 - Very little (4)
 - Not at all (5)
 - I don't want to answer questions about cannabis (6)
-

Q11

Would you be interested in learning more about medical cannabis?

- Yes (1)
 - No (2)
-

Q12

Are you a:

- Physician (MD/DO/MBBS) (1)
 - NP/PA (2)
 - Other, please specify: (3)
-

Q13

What is your specialty?

- Internal Medicine (1)
 - Family Medicine (2)
 - Other, please specify: (3)
-

Q14

What is your age?

_____ years old (1)

Q15

What is your gender?

- Male (1)
 - Female (2)
-

Q16

THANK YOU FOR COMPLETING THE SURVEY!

Please click **SUBMIT** to record your answers.

APPENDIX B

PRE-TEST

Health Care Professionals opinions, experience, and attitude toward Medical Marijuana

Start of Block: Default Question Block

Q1 I am a:

- Provider (MD/DO) (1)
 - Provider (NP/PA) (2)
 - RN or LPN (3)
 - Pharmacist (4)
 - Other (5) _____
-

Q2 Are you registered to certify patients for medical cannabis in the Montana Medical Marijuana Program?

- Yes (1)
 - No (2)
 - Prefer not to answer (3)
-

Q3 Have you ever certified patient for the Montana Medical Marijuana Program?
(Providers Only)

- Yes (1)
 - No (2)
 - Prefer not to answer (3)
-

Q4 Do you care for patients who have been Certified?

- Yes (1)
 - No (2)
 - Prefer not to answer (3)
 - I know (4)
-

Q5 Please indicate your agreement or disagreement with the following statements.

	Strongly Agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)
Medical Cannabis is a legitimate medical therapy (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical providers should be offering medical cannabis for managing medical conditions (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical cannabis has significant interactions with medical therapies (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical cannabis can effectively treat symptoms associated with medical conditions (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The process to certify patients in medical cannabis program prevents me from enrolling patients (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q6 Please indicate your agreement or disagreement with the following statements.

	Strongly agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)
I am aware patients use medical cannabis illegally to treat symptoms or medical conditions (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical cannabis through the state of Montana is safer than cannabis that the patients use illegally (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical Cannabis is relatively safe for pain control when compared to opioids (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q8 How helpful do you think cannabis/marijuana is for the following symptoms:

	Very Helpful (1)	Somewhat Helpful (2)	Neither helpful or not helpful (3)	Somewhat not helpful (4)	Not helpful at all (5)	I I know (6)
Pain (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seizures (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nausea and/or vomiting (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Muscle spasms (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anxiety (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depression (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sleeplessness (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weight loss (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tics (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Inflammatory
bowel
disease,
including
Crohn's
disease (8)

Terminal
illness, with a
probable life
expectancy of
less than one
year (9)

Intractable
pain (10)

Post-
Traumatic
Stress
Disorder (11)

Q10 To what extent do you think cannabinoids increase the risk for:

	A lot (1)	Somewhat (2)	A little (3)	Not at all (4)	I know (5)
Psychotic symptoms (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depression (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Memory problems (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Respiratory symptoms (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accidents (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Low Birth weight (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cognitive decline (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nausea (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cyclic Vomiting (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q11 To what extent can cannabinoids improve the following for patients

	A great improvement (1)	Improvement (2)	Small improvement (3)	None at all (4)	I know (5)
Physical functioning (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Energy level (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mood (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enjoyment of life (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social engagement (visiting with friends and family) (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to work (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sense of hope (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q12 How prepared are you to answer patient questions about medical marijuana or medical cannabis?

- very prepared (1)
 - somewhat prepared (2)
 - Not prepared (3)
 - None at all (4)
 - I do not want to answer questions about medical marijuana or cannabis (5)
-

Q13 Would you be interested in learning more about medical marijuana or medical cannabis?

- Yes (1)
 - No (2)
-

Q14 Do you support the de-scheduling of Medical Marijuana in order for the development of more research around the risks and benefits?

- Yes (1)
 - No (2)
 - Prefer not to answer (3)
-

Q16 What is your specialty?

Q17 How many years have you been in practice?

End of Block: Default Question Block

APPENDIX C

EDUCATIONAL POWERPOINT



Montana Medical Marijuana
Program and emerging research
on medicinal cannabis

Kelly Earle RN, BSN
DNPS

AGENDA

- What is cannabis?
- Endocannabinoid System
- National laws surrounding medical cannabis
- Montana Medical Marijuana program
- Literature Review

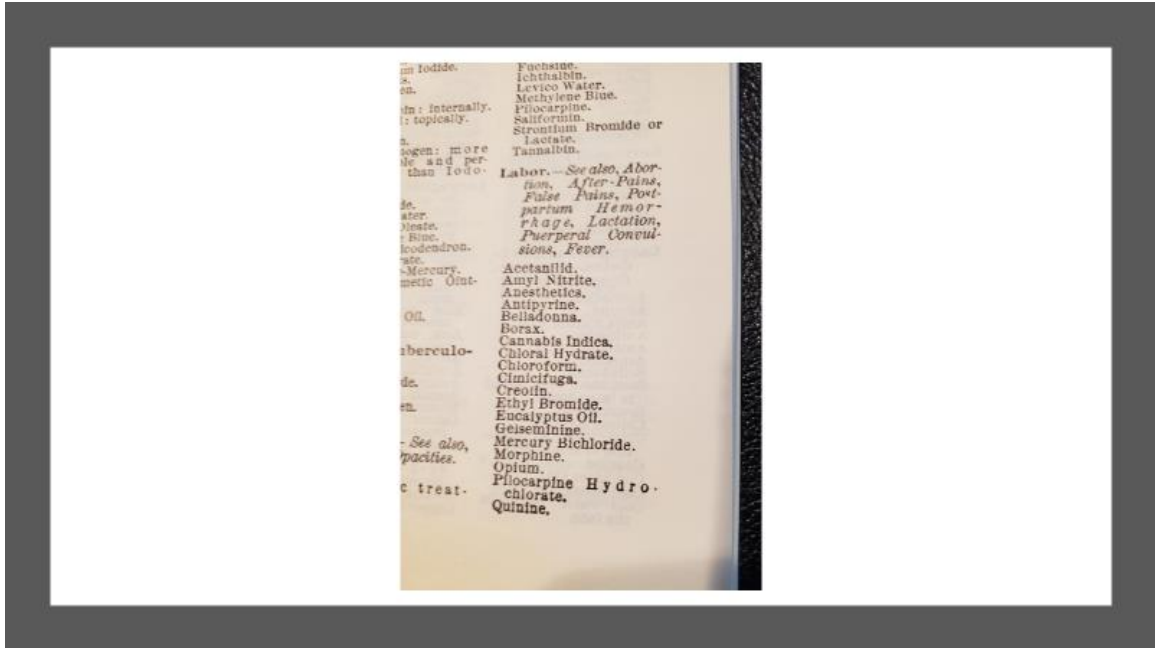
What is Medical Marijuana

- Dried flowers and leaves on the cannabis plant
- Main Psychoactive Component Delta-9-tetrahydrocannabinol (THC)
- Over 100 other Cannabinoids [cannabidiol (CBD), cannabinol, cannabichromene, cannabidivarin, and tetrahydrocannabivirin)
- Grand View Research estimated legal marijuana would be worth \$146 billion by the year 2025



Background

- Evidence suggests that marijuana may have been used as early as 2900 BC for medicinal applications
- Widely used in the 19th and 20th centuries in US
 - Merck Manual 1899
- Federal Restriction Laws
 - 1937- Marihuana Tax Act
 - 1950s Boggs Narcotic Control Act
 - Substance Control Act 1970



Substance Control Act 1970

- This law placed all regulated substances into one of five schedules. Placement is based upon medical use, abuse potential, and safety or dependence liability. Schedule I substances are considered to have the greatest risk within this criteria, whereas schedule V are considered the safest. Marijuana (and marijuana extract) is a schedule I drug along with drugs such as phenylcyclohexyl pyrrolidine (PCP) and ecstasy or MDMA. Cocaine, Morphine and opium are schedule II (DEA, 2019).

Evolving policy

- California – Proposition 215, The Medical Marijuana Initiative (1996)
- Since this time 10 states have legalized Recreational/Adult use programs
 - Washington, Colorado, Oregon, California, Nevada, Alaska, Maine, Vermont, Massachusetts, Michigan
 - Recreational Marijuana sale legal in Illinois January 1, 2020

Montana Medical Marijuana Program (MMP)

- Initiated in 2004
 - Most recent 2016, Montana Medical Marijuana Initiative I-182
 - Repealed 3 patients/per provider law
 - Passed with 57.87% of the vote

MMP currently

- August 2019
 - 35,158 enrollees
 - 252 Providers + 74 pending provider enrollments/renewal/updates
 - Gallatin County 5877 enrollees -71 providers
 - Maddison County 390 enrollees -1 provider
 - Park County 1189 enrollees – 3 providers

- BHDH serves 7,456 between these three counties

Tota	Percentage	Age
61	0.17	Cardholders between 1 and 17 years of age
1,189	3.38	Cardholders between 18 and 20 years of age
6,677	18.99	Cardholders between 21 and 30 years of age
7,476	21.26	Cardholders between 31 and 40 years of age
5,614	15.97	Cardholders between 41 and 50 years of age
6,063	17.25	Cardholders between 51 and 60 years of age
6,190	17.61	Cardholders between 61 and 70 years of age
1,633	4.64	Cardholders between 71 and 80 years of age
232	0.66	Cardholders between 81 and 90 years of age
23	0.07	Cardholders over 90 years of age

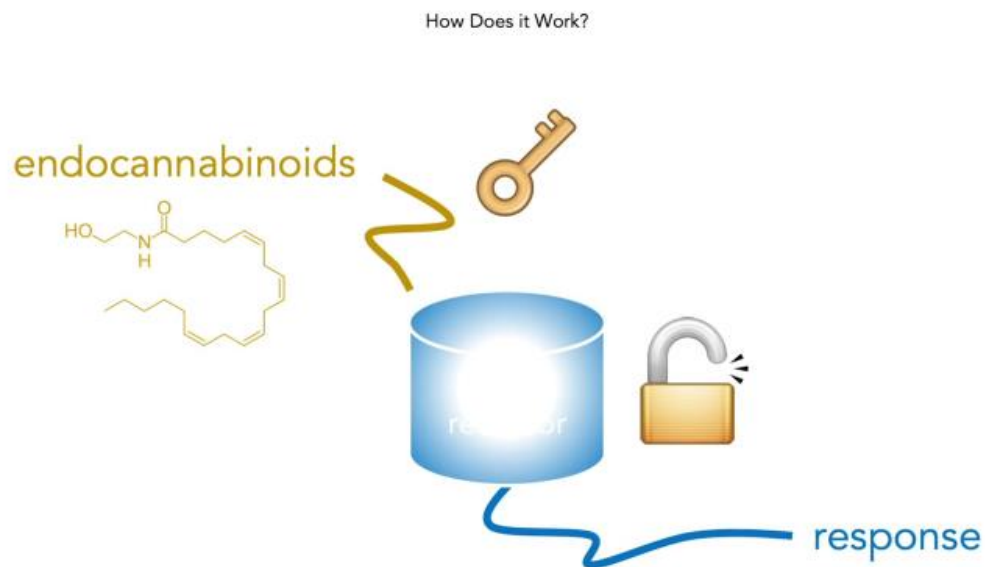
*May contain duplicate counts if a patient reports more than one condition

Condition	Number
Admittance into hospice care	29
Cachexia or Wasting Syndrome	644
Cancer, Glaucoma or HIV (AIDS)	2,345
Central nervous system disorder resulting in chronic, painful spasticity or muscle spasms	2,640
Crohn's disease	419
Epilepsy or an intractable seizure disorder	992
Intractable nausea or vomiting	2,416
Multiple Sclerosis	388
Painful peripheral neuropathy	1,041
Post-Traumatic Stress Disorder	5,603
Severe chronic pain	27,665

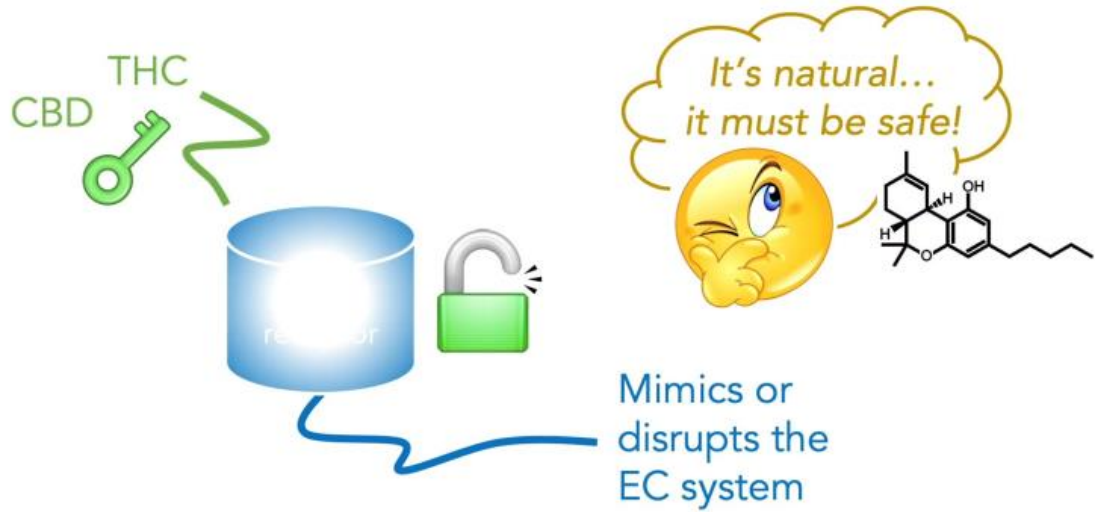
Endocannabinoid system

- 1990s Scientist discovered endocannabinoids
- Endocannabinoids work on CB1 and CB2 receptors
- Present in all vertebrates – mammals, birds, reptiles, amphibians, fish all produce endocannabinoids
- Research initially suggested endocannabinoid receptors were only present in the brain and nerves, but scientists later found that the receptors are present throughout the body, including our skin, immune cells, bone, fat tissue, liver, pancreas, skeletal muscle, heart, blood vessels, kidney, and gastrointestinal tract
- Elevate 42% with Singing and dancing

- Endocannabinoid System
 - Stress
 - Appetite
 - Pain receptors
- Endocannabinoid deficiency (CECD)
 - Migraines, fibromyalgia, irritable bowel syndrome



What About Cannabis?



Chronic Pain

- In an analysis of Medicaid enrollees, researchers found “State implementation of medical marijuana laws was associated with 5.88% lower rate of opioid prescribing” (Wen & Hockenberry, 2018).

Cancer

- Many palliative measures
- Early 2000s research suggested cannabinoids (Anandamine, 2GA, CBD) decrease tumor growth
- Epidemiological studies are inconclusive

Seizures

- Epidiolex (Cannabidiol) [CBD] – FDA APPROVAL 2018, Lennox-gastaut syndrome Dravet syndrome Ages 2 years and older

Crohn's Disease

- Endocannabinoid system in the GI tract
- Animal studies Inflammation and Anandamine
- 3 Small studies (n= 93)
 - Cannabis cigarettes vs placebo
 - Cannabis oil vs placebo
 - Cannabis oil vs placebo and quality of life

Reference

- Pacher, P., Bátkai, S., & Kunos, G. (2006). The endocannabinoid system as an emerging target of pharmacotherapy. *Pharmacological reviews*, 58(3), 389–462. doi:10.1124/pr.58.3.2
- Ross, R. (2019) Demystifying the endocannabinoid system. Ted x. <https://www.youtube.com/watch?v=8GsmTFytBYI>
- Russo, E. (2004) Clinical endocannabinoid deficiency (CECD); can this concept explain therapeutic benefits of cannabis in migraine, fibromyalgia, irritable bowel syndrome and other treatment-resistant conditions? *Neuro Endocrinology Letters*, 25 (1-2), 31-39

- THCa THC activated is the original version that doesn't affect you psychoactively. Really good for chrones disease. Treats locally with cannabinoids of chrones
- Endocannabinoid deficiency system – CB1 (Brain?), CB2(Bowel?)

APPENDIX D

POST-TEST SURVEY

Post Test. Medical Marijuana

Start of Block: Default Question Block

Q1 I am a

- Registered nurse (1)
 - LPN (2)
 - Social worker (3)
 - Other (4) _____
-

Q13 Did you take the Pre-test sent out earlier in October?

- Yes (1)
 - No (2)
-

Q3 Do you care for patients who have been Certified to the Montana Medical Marijuana Program?

- Yes (1)
 - No (2)
 - Prefer not to answer (3)
 - Dont know (4)
-

Q5 Please indicate your agreement or disagreement with the following statements.

	Strongly Agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)
Medical Cannabis is a legitimate medical therapy (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical providers should be offering medical cannabis for managing medical conditions (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical cannabis has significant interactions with medical therapies (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical cannabis can effectively treat symptoms associated with medical conditions (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The process to certify patients in medical cannabis program prevents me from enrolling patients (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q7 Please indicate your agreement or disagreement with the following statements.

	Strongly agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)
I am aware patients use medical cannabis illegally to treat symptoms or medical conditions (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical cannabis through the state of Montana is safer than cannabis that the patients use illegally (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical Cannabis is relatively safe for pain control when compared to opioids (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 How helpful do you think cannabis/marijuana is for the following symptoms:

	Very Helpful (1)	Somewhat Helpful (2)	Neither helpful or not helpful (3)	Somewhat not helpful (4)	Not helpful at all (5)	I dont know (6)
Pain (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seizures (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nausea and/or vomiting (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Muscle spasms (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anxiety (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depression (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sleeplessness (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weight loss (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tics (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Inflammatory
bowel
disease,
including
Crohn's
disease (8)

Terminal
illness, with a
probable life
expectancy of
less than one
year (9)

Intractable
pain (10)

Post-
Traumatic
Stress
Disorder (11)

Q13 To what extent do you think cannabinoids increase the risk for:

	A lot (1)	Somewhat (2)	A little (3)	Not at all (4)	Dont know (5)
Psychotic symptoms (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depression (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Memory problems (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Respiratory symptoms (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accidents (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Low Birth weight (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cognitive decline (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nausea (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cyclic Vomiting (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q15 To what extent can cannabinoids improve the following for patients

	A great improvement (1)	Improvement (2)	Small improvement (3)	None at all (4)	Dont know (5)
Physical functioning (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Energy level (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mood (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enjoyment of life (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social engagement (visiting with friends and family) (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to work (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sense of hope (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q17 How prepared are you to answer patient questions about medical marijuana or medical cannabis?

- very prepared (1)
 - somewhat prepared (2)
 - Not prepared (3)
 - None at all (4)
 - I do not want to answer questions about medical marijuana or cannabis (5)
-

Q19 Do you support the de-scheduling of Medical Marijuana in order for the development of more research around the risks and benefits?

- Yes (1)
 - No (2)
 - Prefer not to answer (3)
-

Q20 Do you feel more comfortable discussing Medical marijuana as an intervention with patients now that you have had some education?

- Yes (1)
 - No (2)
 - I don't know (3)
-

Q21 Any comments you would like to add would be helpful

End of Block: Default Question Block

APPENDIX E

IRB APPROVAL



INSTITUTIONAL REVIEW BOARD

For the Protection of Human Subjects

FWA 00000165

2155 Analysis Drive
c/o Microbiology & Immunology
Montana State University
Bozeman, MT 59718
Telephone: 406-994-4706
FAX: 406-994-4303
Email: cherylj@montana.edu

Chair: Mark Quinn
406-994-4707
mquinn@montana.edu
Administrator:
Cheryl Johnson
406-994-4706
cherylj@montana.edu

MEMORANDUM

TO: Kelly Earle

FROM: Mark T. Quinn *Mark J. Quinn*
Chair, Institutional Review Board for the Protection of Human Subjects

DATE: May 10, 2019

RE: *Healthcare Professionals' Attitudes, Perceptions and Behavior Toward Medical Marijuana [KE051019-EX]*

The above research, described in your submission of **May 09, 2019**, is exempt from the requirement of review by the Institutional Review Board in accordance with the Code of Federal regulations, Part 46, section 101. The specific paragraph which applies to your research is:

- (b) (1) Research conducted in established or commonly accepted educational settings, involving normal educational practices such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.
- (b) (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation; and (iii) the information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by section 16.111(a)(7).
- (b) (3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (b)(2) of this section, if: (i) the human subjects are elected or appointed public officials or candidates for public office; or (ii) federal statute(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.
- (b) (4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available, or if the information is recorded by the investigator in such a manner that the subjects cannot be identified, directly or through identifiers linked to the subjects.
- (b) (5) Research and demonstration projects, which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs.
- (b) (6) Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed, or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the FDA, or approved by the EPA, or Food Safety and Inspection Service of the USDA.

Although review by the Institutional Review Board is not required for the above research, the Committee will be glad to review it. If you wish a review and committee approval, please submit 3 copies of the usual application form and it will be processed by expedited review.