Implementation of Multimedia Educational Tools to Increase Participant Willingness to Disclose Medical Marijuana Use to Anesthesia Providers Prior to Surgery

Bre'Yana Gibson

School of Nursing, Cedar Crest College

Author Note

This paper is based on data from the DNP Project completed as partial fulfilment of the Doctor of Nursing Practice degree with the guidance and supervision of the following:

DNP Project Chair: Catherine Zurawski DNP, CRNP, FNP-C
DNP Project Chair: David Holland Ph.D., CRNP
DNP Project Mentor: Dana Hein MSN, CRNA, DNP
DNP Project Mentor: Denise Tola DNP, CRNA, CHSE
DNP Project Mentor: Kevin Harbison, PharmD
CRNA Faculty Advisor: Kimberly Juhas- Davis, DrNP, CRNA

Correspondence concerning this paper should be addressed to Bre'Yana Gibson, BSN, RN, CCRN, Doctoral Candidate in the Nurse Anesthesia Program at Cedar Crest, address. Email: bgibsont@cedarcrest.edu

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Abstract

Marijuana use in the United States is no new phenomenon; for centuries marijuana has been used for both medicinal and recreational purposes. Currently, marijuana is considered an illicit drug but can be used legally with legal medical marijuana prescriptions. While there are many therapeutic benefits to its use (pain management, and complications associated with neuromuscular disease), there are also many complications associated with marijuana use including physiologic changes in cardiac, neurological, and pulmonary functioning. As a result, it is imperative for patients to inform anesthesia providers of marijuana use prior to receiving anesthesia for any surgical procedure to avoid complications. Therefore, the purpose of this project was to utilize multimedia educational tools to inform patients on the anesthetic implications associated with marijuana use. Recent literature shows that patients are best educated when utilizing multimedia tools for educational purposes, such as pamphlets or a video. The DNP students collaborated with Verilife medical marijuana dispensary and distributed multimedia educational tools via email. Data was analyzed using descriptive statistics from post-survey results which demonstrated increased willingness to disclose marijuana use to anesthesia providers before surgery.

Key words: multimedia educational tools; medical marijuana; patient education; surgery; medical marijuana dispensary, anesthesia providers

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Chapter 1: Introduction and Overview of the Problem of Interest

Background

The use of marijuana in the United States is no new phenomenon. Individuals from various cultures have used marijuana and the chemical derivatives of marijuana substances dating back to the 1800's for medicinal purposes and recreational use (Bostwick, 2012). Medically, marijuana is most used as an adjunct method for chronic pain (Horvath et al., 2019). Throughout the years, the legalization of marijuana has fluctuated from state to state, but federally, marijuana is still considered an illicit substance. Therefore, individuals could face incarceration if marijuana was not approved for medical purposes in many states. As a result, individuals who regularly use marijuana are often reluctant to inform their anesthesia providers of their marijuana use prior to receiving anesthesia for surgery.

In recent years, more states are legalizing the use of marijuana for recreational and medicinal purposes resulting in a significant increase in reported marijuana use in different age groups (Jennings et al., 2019). While there is increased acceptance of marijuana use due to legalization in different states, many still do not report marijuana use because they were not specifically asked, fear of judgement, or cancellation of a surgical procedure (Leos-Toro et al., 2018). This lack of communication creates increased risk for potential complications before surgery (may require increased anesthetic requirements for induction), during surgery (including cardiac arrest, and airway compromise), and increased narcotic requirements for pain management after surgery (Horvath et al., 2019).

There are many physiological effects of marijuana that are dose dependent on tetrahydrocannabinol (THC). According to research, the most common affected areas include cardiovascular, respiratory, and central nervous systems (CNS) (Horvath et al., 2019). Some of the most common side effects affecting the CNS include euphoria, dysphoria, panic, psychosis, anxiety, learning and memory impairment, and increased risk of mental illness in those predisposed to depression, and schizophrenia (Echeverria-Villalobos et al., 2019). Cardiovascular effects may include tachycardia/ bradycardia, vasoconstriction and vasodilation,

electrocardiogram changes, increased risk for myocardial infarction and/or stroke (Echeverria-Villalobos et al., 2019). Marijuana use may cause individuals to have hyperactive airways, inflammation, and obstructive lung disease over time (Echeverria-Villalobos et al., 2019). Although not conclusive, chronic effects of marijuana smoking is thought to be associated with the development of emphysema, lung cancer, hyperemesis syndrome (increased aspiration risk), and prolonged bleeding times (Echeverria-Villalobos et al., 2019).

Cannabinoid hyperemesis syndrome is a debilitating complication of chronic marijuana use characterized by recurrent nausea, vomiting, and abdominal pain (Knowlton, 2019). This syndrome can cause some confusion because marijuana is known to have antiemetic properties especially in individuals with cancer, but other individuals may be prone to hyperemesis (Knowlton, 2019). The pathophysiology of this syndrome is not completely understood but researchers believe there is a strong association with crossbreeding and the genetic modification of cannabis crops that are available for consumer; these changes may alter the potency of the marijuana (Knowlton, 2019). The syndrome is classified into three phases including the prodromal phase (early morning nausea, abdominal pain), hyperemetic phase (cyclical nausea and vomiting with continued abdominal pain), and the recovery phase (symptoms resolve). The only definitive treatment is to abstain from marijuana consumption (Knowlton, 2019).

Preoperative Considerations

Anesthesia providers should complete a thorough preoperative anesthetic assessment on all patients. This assessment should include drug use, specifically assessing marijuana use. This assessment is imperative for all patients undergoing anesthesia because patient reports of marijuana use can alter the anesthetic plan both intraoperatively and postoperatively (Horvath et al., 2019). If marijuana use is confirmed, patients should be asked about the type, frequency, and last use prior to receiving anesthesia (assess acute intoxication and potential for withdrawal symptoms) (Horvath et al., 2019). Procedures for patients with acute intoxication should be postponed for up to 72 hours (Alexander & Joshi, 2019). It is also important to assess marijuana use to rule out differential diagnosis because these patients may experience anxiety, paranoia, psychosis, and are more prone to a violent emergence; side effects of acute intoxication can be confused with malignant hyperthermia, serotonin syndrome, overdose, and/or thyrotoxicosis (Alexander & Joshi, 2019).

Intraoperative and Postoperative Considerations

There are currently limited human studies involving intraoperative management of patients who use marijuana but knowing the risks for respiratory and cardiovascular compromise, anesthesia providers should take extreme caution. Some of the major cardiovascular concerns include tachycardia, cardiac output, and initial hypertension (Alexander & Joshi, 2019). With time, peripheral vasodilation can result causing orthostatic hypotension and an increase in oxygen demand and cardiac work (Alexander & Joshi, 2019). Marijuana use has been associated with electrocardiogram changes including premature ventricular contractions, atrial fibrillation, sinus bradycardia, and atrioventricular blockade (Alexander & Joshi, 2019). These effects are seemingly dose dependent. For example, research has shown lower doses of marijuana consumption was associated with increased sympathetic activity (elevated heart rate, blood pressure, and cardiac output) (Alexander & Joshi, 2019). On the contrary, high doses of marijuana consumption was associated with parasympathetic stimulation including bradycardia, vasodilation, and hypotension (Alexander & Joshi, 2019). Finally, there is an elevated risk of myocardial infarction (MI) associated with marijuana use (Huson et al., 2018). It is presumed that the combination of tachycardia and peripheral vasodilation leading to orthostatic hypotension, increased cardiac output and work is associated with increased risk of MI (Huson et al., 2018). The risk of MI is highest within the first hour of consumption and decreases significantly after (Huson et al., 2018).

These patients are at risk for spontaneous pneumothorax and bullous emphysema (associated with inhalational marijuana), oxygen desaturations, and possible lung collapse associated with positive pressure ventilation (Horvath et al., 2019). Also, due to airway hyperreactivity these patients are at increased risk for airway edema and bronchospasm (Horvath et al., 2019). In combination with the anesthetic medications utilized for induction and maintenance of anesthesia, marijuana use can potentiate the effects of some of these medications (propofol, nondepolarizing muscle relaxants) leading to respiratory and cardiovascular depression (Alexander & Joshi 2019). The major postoperative concern is pain control; these patients may require increased narcotics for pain control and cannabis withdrawal syndrome (Alexander & Joshi 2019).

System and Population Impact

Marijuana is the most used illicit drug in the in the United States (Echeverria-Villalobos et al., 2019). Although still illegal federally, 16 states, two territories, and Washington D.C. have legalized marijuana for adult recreational use while 36 states and four territories have approved marijuana for specified medical use with valid prescriptions (Echeverria-Villalobos et al., 2019). Currently there are approximately 22 million Americans who consume some form of marijuana each month and 4.3 million of these individuals have valid medicinal marijuana prescription cards (Bridgeman & Abazia, 2017). Regulations on medical marijuana use are constantly evolving and there are only a few cannabis formulations approved for use (marijuana, dronabinol, nabilone, and cannabidiol) (Food and Drug Administration 2020). Although the legalization of marijuana for medically approved purposes and recreational use is occurring over many states federally, it is still considered a Schedule I drug under the 1970 Controlled Substances Act (referring to high potential for abuse and no accepted therapeutic use) (Alexander & Joshi, 2019). As a result, there still lies a disconnect between communication of use between many providers and patients. Some patients report fear of disclosing marijuana use to medical providers for fear of judgement (this reason is fading with legalization of medical marijuana) and some providers report lack of knowledge of the physiologic effects of marijuana use with regards to treatment of chronic disease and/or anesthetic management during surgery due to lack of conclusive research (Boehnke et al., 2021).

Currently, medicinal marijuana may only be prescribed due to complications associated with qualifying conditions (Appendix C) (Verilife, 2021). Conditions include Alzheimer's disease, amyotrophic lateral sclerosis, multiple sclerosis, severe and chronic pain, severe nausea, HIV/AIDS, glaucoma, epilepsy/ seizures, Crohn's disease, and cancer (Huson et al., 2018). Research supports that medicinal marijuana has properties that promote analgesia, immunosuppression, muscle relaxation, antiemesis, bronchodilation, allergy suppression, and neuroleptic and antineoplastic effects (Huson et al., 2018).

As the legalization of marijuana continues to grow state by state across the U.S., the number of legal medical marijuana users will continue to increase. The physiologic changes associated with acute intoxication and chronic use of marijuana place patients at increased risk for complications before, during, and after any

surgical procedure (Echeverria-Villalobos et al., 2019). As a result, anesthesia providers may need to alter anesthetic plans to keep patients adequately anesthetized and hemodynamically stable throughout the procedure. Patient reports of marijuana use to anesthesia providers are inconsistent and many anesthesia providers are unaware of patient marijuana use. This lack of knowledge increases patient risk of adverse events during surgery (Boehnke, et al., 2021). Therefore, this DNP project can serve as beginning point to open conversations to discuss the importance of incorporating assessment of marijuana use in patients before receiving anesthesia for surgical procedures. This will ultimately aid in preventing unwanted complications and lead to improved patient and provider satisfaction before, during, and after surgery.

Statement of Purpose

The purpose of this Doctor of Nursing Practice (DNP) project was to utilize multimedia educational tools to increase patient knowledge about the anesthetic implications of medical marijuana use prior to receiving anesthesia for any surgical procedure resulting in increased patient willingness to report marijuana use to anesthesia providers. The use of multimedia educational tools (video, educational digital handout, and post-survey) was used to increase participant understanding on how marijuana use affects anesthesia requirements for surgery, and to make the information easily accessible. It was expected that implementation of this project would help improve patient safety by allowing anesthesia providers to administer appropriate anesthetics tailored to patient needs based off accurate documentation of medical and drug history in the patient's medical record prior to surgery.

PICO Question

In patients who use medical marijuana, will multimodal educational tools about the anesthetic implications related to marijuana increase their willingness to disclose marijuana use anesthesia providers prior to receiving anesthesia?

Objectives

1. There would be at least 30 participants that purchased medical marijuana from the Pennsylvania Verilife dispensaries who viewed the presentation on the anesthetic implications of marijuana use and

completed the post-survey within a 2-month period as evidenced by data collection from survey responses collected through google survey managed CSM at Verilife.

2. After viewing the project materials created by the DNP students, participants would be more willing inform anesthesia providers of their marijuana use including the amount, frequency, route, and type of medical marijuana consumed on a regular basis prior to receiving anesthesia for surgery evidenced through the survey responses.

Chapter 2: Review of Evidence / Literature

Review of the Literature

To find relevant research pertaining to the use of multimedia educational tools in patient education a literature search was conducted using EBSCOhost- Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, WorldCat Discovery, and Google Scholar. The search was narrowed using a combination of keywords and Boolean terms ("AND," "OR") in the previously mentioned databases to find a variety of results. The most common keywords used were "multimedia tools," "multimedia learning," "patient education," "patient learning," "understanding," "education," "patient outcomes," "surgery," and "marijuana use." Through different databases, the key words were rearranged, which altered the number of article results. Limitations were added to increase specificity in the results such as publishing year range from 2015-2021, journal articles, full text articles, and English language. The most relevant research resulted in the WorldCat Discovery with 858 relevant articles. There were nine relevant articles through CINAHL, and thousands of articles through Google Scholar that were results in other databases. There were many overlaps in article results throughout the databases.

After reviewing the articles provided through the database searches, multiple articles were reviewed to assess which articles were appropriate to answer the PICO question. All articles were peer reviewed and included an abstract to summarize the data presented in the articles. Six articles were chosen that provided information to support the PICO question including three randomized controlled trials, one quasi-experimental design, and one "random repeated measures experimental design." The purpose of the literature search process was to find relevant evidenced based research that assessed the effectiveness of utilizing multimedia tools (videos, etc.) for patient education and resultant patient outcomes.

Assessment and Strength

All the studies reviewed for this PICO question took place in the clinical setting (inpatient hospital setting and outpatient clinical setting). The target populations focused on adults only. The studies were conducted in various countries (United States (3), Taiwan (2), and Iran) (Appendix A). The strength of all studies was based on John Hopkins Evidence Level and Quality Guide (Appendix B). Of the five included articles, the three RCTs were level I evidence (Greene et al., 2017; Olivo et al., 2020; Fahimi et al., 2020), the

quasi-experimental study (Hsueh et al., 2014) and randomized repeated measures design study (Huang et al., 2017) were level II.

Quality

The quality of the studies included in the "Evidence Synthesis" (Appendix B) were rated either "High" or "Good" quality based on the John Hopkins Evidence Level and Quality Guide (Appendix B). High quality evidence (Greene et al., 2017; Fahimi et al., 2020) has consistent results that are generalizable to the population, adequate sample size for the study design, adequate control, definitive conclusions, and consistent recommendations based on best evidenced based practice supported by a comprehensive literature review (Dang & Dearholt, 2017). Good quality evidence (Hsueh et al., 2014; Lopez-Olivo et al., 2020; Huang et al., 2017) refers to studies with consistent results, sufficient sample size, some control, definitive conclusions, and recommendations based on fairly comprehensive literature reviews (Dang & Dearholt, 2017).

Study Overview

The studies analyzed for purposes of this project focused on the use of multimedia tools for patient education and preparation for surgical procedures compared to traditional educational methods such as printouts. In all studies, the use of an educational film/video was used as the multimedia educational tool distributed to patients prior to a surgical procedure for preoperative education, or to improve knowledge and compliance in the medical management of chronic diseases. The use of baseline and post intervention knowledge questionnaires were utilized to assess if the implementation of the multimedia educational tool resulted in increased patient knowledge and preparation of the disease process, medical management, and preparation for surgery. The specifics of each study were summarized in Appendix A.

Preparation for Surgery

The use of a preoperative patient education video was made accessible to patients prior to receiving surgical interventions (Greene et al., 2017; Hsueh et al., 2014, Fahimi et al., 2020). The implementation of the video was used as an adjunct to preoperative counseling (Greene et al., 2017; Hsueh et al., 2014, Fahimi et al., 2020). Preoperative and day of surgery questionnaires were distributed to patients to assess knowledge and preparedness for surgery (Greene et al., 2017; Hsueh et al., 2014, Fahimi et al., 2020). The use of the

educational video prior to surgery resulted in increased preparedness for surgery and compliance with presurgical instructions (Greene et al., 2017; Hsueh et al., 2014, Fahimi et al., 2020).

Medical Management of Chronic Disease

Knowledge and management of specified chronic diseases were assessed through preintervention surveys on osteoporosis and diabetes (Huang et al., 2017; Lopez-Olivo et al., 2020). Participants selected split into two groups (control versus experimental) (Huang et al., 2017; Lopez-Olivo et al., 2020). The control groups received traditional education methods (printouts and pamphlets on disease management) while the experimental groups received an educational video along with the traditional printouts (Huang et al., 2017; Lopez-Olivo et al., 2020). Participants completed post-intervention surveys to assess knowledge and effectiveness of the educational video directly after the intervention and at different time periods set by the experiment creators (Huang et al., 2017; Lopez-Olivo et al., 2020). The results of the studies supported the use of the educational video in cooperation with traditional methods to enhance patient knowledge and understanding of disease processes and medical management (Huang et al., 2017; Lopez-Olivo et al., 2020).

Limitations

There were many limitations associated with the studies included in the evidence synthesis for this project. Some of the reoccurring themes in the studies included generalizability, anticipated sample size, inability to perform double blind assessment for the RCTs, attrition, and the inability to assess if patients with access to the educational videos were able to have repeated exposure to the information in that format (Lopez-Olivo et al., 2020, Hsueh et al., 2014). A full review of limitations associated with the included studies are in Appendix A. The studies reported inability to generalize results due to participants consisting of one race (Greene et al., 2017), unblinded or single blinded assessments (Greene et al., 2017; Fahimi et al., 2020; Hsueh et al., 2014), confounding information from outside sources (Fahimi et al., 2020), and failure of some participants to complete all post surveys at various time intervals (Lopez-Olivo et al., 2020). All but one study failed to mention the effect of literacy on intervention outcome (Lopez-Olivo et al., 2020).

Evidenced Based Practice Summary

The studies utilized for the evidence synthesis for this project show that the use of multimedia educational methods are effective tools for patient education for chronic disease management and preparation

for surgical procedures. Research also supports the use of multimedia tools for patient education because the use of video is an effective method to translate information in individuals with varying levels of literacy (Lopez-Olivo et al., 2020). The studies included for the evidence synthesis showed that the use of educational videos resulted in improvements in patient understanding and/or preparation for surgical procedures. These studies also showed pre/post surveys are effective methods to evaluate the effectiveness of these educational interventions. Future research should consider the population of interest to make the results more generalizable to the general population. Since the research supports the use of multimedia educational tools, this information can be used to conclude that the use of an educational video and educational digital handout on the importance of informing anesthesia of marijuana use based on the anesthetic implications of marijuana will result in patient increased willingness to report.

Chapter 3: Organizational Framework of Theory

Theoretical Framework

The RE-AIM framework was the theoretical framework appropriate for this project (Appendix E). The RE-AIM framework stands for reach, effectiveness, adoption, implementation, and maintenance and was first described in American Journal of Public Health in 1999; development of the framework is credited to Dr. Russel Glasgow, Dr. Shawn Boles, and Dr. Tom Vogt (Gaglio et al., 2013). Originally, RE-AIM was developed to help make research findings more understandable and generalizable to help balance internal and external validity when attempting to translate research to clinical interventions in humans (Gaglio et al., 2013). This framework was developed in response to trends in research conducted under optimal conditions which were not usually representative of real-life situations but were considered the gold standard for decision making and healthcare guidelines (Gaglio et al., 2013). The application of the RE-AIM framework allowed the implementation of clinical research findings to flow in sequence from reach of a target population and adoption of the desired clinical intervention to implementation and evaluation the effectiveness of a given intervention, and finally maintenance of the intervention in clinical practice (Gaglio et al., 2013). Although the framework was initially designed for consistency in research results and organizing reviews on existing literature on healthcare promotion and disease management, it has evolved over the years to be applied to research involving aging, cancer screening, health policy, environmental change, chronic illness self-management, smoking cessation, practice-based research, and many others (RE-AIM, 2021).

The RE-AIM framework can be applied at the individual and/or institutional level. Reach represents the absolute number, proportion, or representation of individuals who are willing to participate in an intervention, or program (RE-AIM, 2021). Efficacy represents the impact of an intervention including positive and negative effects on the target population and how this may affect the quality of life, economic outcomes, and ability to generalize results to everyone including those outside of the target population (RE-AIM, 2021). Adoption applies to the stakeholders. This represents the absolute number of individuals or intervention agents who commit to delivering and initiating the intervention or program (RE-AIM, 2021). Implementation refers to the fidelity of the intervention agents including consistency of delivery of the intervention as intended, the time

and cost of implementation, and adaptations made to the intervention or strategies (RE-AIM, 2021). Finally, maintenance refers to how the program or intervention becomes institutionalized as a part of routine practices and standard policies (RE-AIM, 2021).

Reach

The population of interest were customers of Verilife Medical Marijuana dispensaries with valid medical marijuana cards registered in Pennsylvania. The target population was accessible through coordination with the Clinical Services Manager who distributed all educational materials through email due to restrictions on in-person programing because of the Covid-19 pandemic. Prior to receiving all project materials, the Verilife customers were informed of the project through email before the implementation period. The official email with all project materials was sent to all customers included in the PA dispensaries list-serve.

Effectiveness

The efficacy of this project was assessed through the post survey results. The purpose of the post-survey was to assess if the information provided in the project materials encouraged participants to be more willing to inform anesthesia providers of their medical marijuana use after viewing the video and digital handout. After participating in this project, participants had increased knowledge on the importance of reporting marijuana use to anesthesia provider prior to receiving anesthesia for any procedure. The potential impact was increased patient safety intraoperatively and adequate pain management.

Adoption

Early in the developmental stages of the project, the DNP students met with and developed professional relationships with the stakeholders involved with this project. After gaining buy in from the DNP Chairs, the DNP students contacted representatives from Verilife to explain the purpose and goals for the project. After meeting with the Clinical Services Manager, Verilife expressed interest in the project. Verilife (PharmaCann) is committed to consumer safety and their representatives welcomed the project idea to help their customers understand the importance of informing anesthesia providers along with other healthcare providers of their

medical marijuana use prior to receiving anesthesia for surgery. The DNP students were in direct contact with the Clinical Services Manager with updates project materials and timeline as the project developed.

Implementation

DNP students utilized multimedia tools via an educational video and digital handout on the anesthetic implications of marijuana use. The video depicted a clinical scenario describing potential complications associated with a patient who regularly uses marijuana denying marijuana use during the preoperative assessment (Appendix D). The digital handout included information on the importance of disclosing marijuana use to healthcare providers prior to receiving anesthesia and potential complications that may present in patients who use marijuana. All educational materials were approved by the DNP Chairs, Clinical Services Manager, and PA Department of Health prior to distribution through email.

Maintenance

Once the educational materials and post survey were finalized, the project materials were sent to Verilife to have access to for future use and reference. The Clinical Services manager expressed interest in expanding the project with future DNP students interested in medical marijuana and building a lasting relationship with Cedar Crest College.

Chapter 4: Project Design

Institutional Review Board (IRB) Approval

Institutional Review Board approval from Cedar Crest College was obtained prior to implementation of this project. All responses obtained from the survey results were from Verilife customers who purchased medical marijuana products from the PA Verilife dispensaries. All participants were given directions on participation in this project prior to implementation. Informed consent forms were included in the email with all project materials sent to the participants (Appendix F). Completion of the post survey served as consent to participate. All personal identifiers of participants were removed from the survey results prior to being made available to DNP students.

Implementation Plan

The implementation of this project was dependent on gaining approval from the key stakeholders. The key stakeholders for this project included Kevin Harbison, PharmD (Clinical Services Manager) and administrative representatives from PharmaCann, the distributive company that owns the Verilife franchise and distributes the medical marijuana to the facilities. After presenting the project plan and gaining approval from the key stakeholders, DNP students created a digital handout, educational video depicting the anesthetic implications of medical marijuana use as it relates to alterations in anesthetic medications needed for induction, and maintenance of anesthesia intraoperatively and potential needs for increased pain management postoperatively.

The project materials included an eight-question multiple choice post survey assessing participant marijuana use and willingness to disclose marijuana use to anesthesia providers. All project materials were sent to all PA Verilife customers with emails included in the company's list-serve. Prior to distribution of the project materials, a pre-implementation email was sent to all PA Verilife customers informing them of the project's purpose and instructions for participation. The implementation period occurred over one month. Participants had until March 1st, 2022, to view project materials and complete the post-survey (Appendix G). All survey responses were filtered into the Verilife's Google Workspace account prior to being made available to DNP students. The CSM removed all participant personal information from the survey responses before

making them accessible to DNP students. The DNP students completed data analysis of the survey responses once the one-month implementation and data collection period ended.

Data Collection Tools

Data was collected utilizing an eight-question post survey developed by DNP students. Participants were instructed to complete the survey after viewing the educational video and digital handout provided in the email with the project materials. The survey was created through Verilife's password protected Google Workspace account managed by the CSM. All survey responses were completely anonymous and IP addresses were removed from survey responses before survey responses were made available to DNP students. The survey questions assessed participant marijuana use and willingness to disclose marijuana use to anesthesia providers before receiving anesthesia for surgery.

Resources Needed

The simulated operating room at Cedar Crest college was used to film the educational video (Appendix D). This provided all the necessary tools needed for the scenario. The simulated OR was free for student use for educational purposes. There were four DNP students participating in the video which was filmed using an iPhone. The video edited on the MacBook laptop computers owned by the DNP students.

Budget Justification

This project did not pose any financial burden to the DNP students. The video was recorded in the simulation lab at Cedar Crest college which was free to DNP students. All project materials were distributed through email. The digital handout and video were created, recorded, and edited with electronic devices owned by the DNP students. If this project were recreated in the future, the cost of materials utilized for the video and recording include:

- MacBook laptop $800-$1200
- iPhone camera $800-$1000
- Simulation Mannequin $20,000-$40,000
- Anesthesia machine: $15,000-$30,000
- Induction materials: $30-$100

Chapter 5: Implementation Procedures and Processes

Implementation of this doctoral project was accomplished by two Cedar Crest doctoral candidates in the nurse anesthesia program. This project utilized multimedia educational tools in the form of a digital handout and a video based on clinical scenarios depicting the importance of informing anesthesia providers of medical marijuana use prior to receiving anesthesia for any surgical procedures. The digital handout was created by DNP students using Microsoft Office 365™ on their personal MacBook laptops. The digital handout included anesthesia considerations for medical marijuana use and potential side effects that may occur before, during, and after surgery. A preoperative checklist created by DNP students was also included in the handout as a reference of information regarding marijuana use that should be shared with anesthesia providers before surgery.

The clinical scenario-based video was filmed in the simulation laboratory for nurse anesthesia students at Cedar Crest College. The DNP students utilized personal iPhones, MacBooks, and a tripod to record the video. Before filming the video, the DNP students worked with the Nursing Simulation Center Manager and arranged scheduling of the high-fidelity simulation center located in the Hamilton Boulevard Building at Cedar Crest College. This is where the clinical based scenario video was filmed and allowed access to the preoperative simulation room, the operating room simulation room, and HAL®, an advanced multipurpose patient simulator. In total, four doctoral students participated in the acting for this video (two doctoral students who developed the project, and two classmates who volunteered to participate in the video). All the multimedia educational tools were approved by the DNP Chairs at Cedar Crest and the CSM at Verilife.

The video was 15-minutes and included an introduction of the DNP students, and a clinical scenario depicting a preoperative, associated intraoperative course, and postoperative assessment of a patient who regularly consumed medical marijuana for back pain. The patient initially denied marijuana use to the anesthesia providers and the clinical scenario showed potential complications including increased dosages for induction medications, and increased pain medication during the intraoperative and post-operative periods. The same patient scenario was replayed with the patient admitting their marijuana use to the anesthesia provider during the preoperative assessment which allowed the anesthesia provider to adequately prepare increased induction medications prior to the patient's entrance into the operating room. The anesthesia provider was also

able to adequately control the patient's pain by increasing dosages during the intraoperative period, so the patient was comfortable in the post-anesthesia care unit.

The targeted population included individuals living in Pennsylvania (18 years of age and older) who held valid medical marijuana cards and purchased their marijuana products from any of the eight PA Verilife dispensaries. Participants also had to be included on the Verilife email list-serve. The exclusion criteria for this project were designated caregivers, minors, and those without access to email, as that was the method of project implementation. Due to restrictions imposed by the Pennsylvania Department of Health and to maintain anonymity amongst the participants, the multimedia educational tools were sent to the participants via Verilife's email list serve. All identifying information (including IP addresses) were removed from the survey responses by the CSM prior to responses being made available to the DNP students. The recruitment email contained a brief description of the project, informed consent to participate in the project, instructions to view the multimedia educational tools, a link to the post survey via Google Survey under the Verilife Google account and contact information of the DNP students. Participants were informed that participation was voluntary and anonymous, and they had the right to withdraw their participation at any time. Participants had one month to view the multimedia educational tools and complete the post survey. Data was collected and analyzed using Google Survey and Microsoft Excel. Upon completion of the post survey, participants were able to maintain access to the multimedia educational tools for future reference. Verilife retained access to the educational materials for future educational purposes.

Chapter 6: Evaluation and Outcomes

Evaluation

After the implementation period was complete, the CSM filtered the data by removing all participant identifying information. The data was sent via email to DNP students. The DNP students utilized descriptive statistics using Microsoft Excel to organize data. The descriptive statistics were used to assess if the use of an educational video and digital handout would be an effective method to increase knowledge on the importance of disclosing marijuana use prior to receiving anesthesia for surgery, and if participants would notify anesthesia providers of their marijuana use if surgery was required. There were 54 participants who completed the post survey, and all responses were used for data analysis.

Outcomes

An email containing all project materials (consent form, video, and digital handout) was sent to all Verilife customers that purchased medical marijuana products from PA Verilife dispensaries with active email addresses through the Verilife email list-serve. Participants had one month to view all project materials and complete the post survey. There were 54 completed surveys filtered through the Verilife Google Workspace account. Data analysis revealed, 96% of the participants replied “yes” to the question “If you require surgery, will you inform your anesthesia provider(s) of your marijuana use?” In addition, data analysis revealed 94% of the participants reported better understanding of the importance of disclosing marijuana use to anesthesia providers before surgery. As a result, it can be concluded that the use of multimedia educational tools for this project was an effective method of providing education and important information to patients regarding the anesthetic implications of marijuana use, and the importance of notifying anesthesia providers before surgery. Other pertinent information displayed in the survey results included there were more male (30) than female (24) participants, majority of the participants were between the ages of 18-30 years of age (46%), the area with the highest number of participants was Lancaster (11 participants), the preferred method of consumption was inhalation (89%), and the most common frequency was 21-31 days per month (40 participants). Graphic presentation of all descriptive statistics is in Appendix H.

If this project is continued for future DNP students, it could be expanded to include all Verilife dispensaries and/or other medical marijuana dispensaries throughout the U.S. As a result, the sample size of the

participants would increase and make the results of the surveys more generalizable to the population. Another improvement to the project would be to create a shorter video (original was approximately 14 minutes). A shorter video may increase project participation because a short video with the same information quality will decrease the time spent watching the video and completing the survey. Finally, future projects should develop a pre and post-test design so statistical analysis such as a paired t-test could be used to assess if the results of the interventions are statistically significant. Future needs assessments can be completed to determine if there is a knowledge deficit on the various methods of consumption versus patient preference and associated risks since majority of the participants reported inhalation as their primary method of consuming marijuana (Appendix H). Also, majority of the participants were between the ages of 18-30, therefore future projects could assess the relationship between age, frequency of use, hesitation related to disclosing marijuana use.

Discussion

In general marijuana is a hot topic in health care with the legalization of its use occurring in multiple states. In Pennsylvania, marijuana use is legal for medicinal purposes only which explains why this project focuses on medical marijuana. Specifically, this project assessed if the use of multimedia educational tools in the forms of a video and digital handout on the anesthetic implications of marijuana use would increase participant willingness to disclose medical marijuana use to anesthesia providers. All project components were sent through email. Participants expressed increased understanding of the importance in informing anesthesia providers of marijuana use before surgery after viewing the video and handout. The results of this project showed using multimedia educational tools are effective methods in delivering valuable information about health-related topics, specifically marijuana use and its effects on anesthesia requirements.

Also, the use of this project design was beneficial due to Covid-19 restrictions for in-person gathering and restrictions on programming in the dispensaries. This project design allowed for participants to view and complete the survey on their time if it was completed within the stated one-month time frame. This project utilized a convenience sample representing PA Verilife customers only. Future projects related to this topic should incorporate a pre/post-test design to assess if participants are willing to inform anesthesia providers of medical marijuana use and why. The use of a shorter video with a pre/posttest design would increase participation, engagement and DNP students would be able to establish statistical significance with data results.

Chapter 7: Implications for Nursing Practice

Implications for Practice

The implications for practice serve to increase patient safety while receiving anesthesia for surgical procedures by increasing patient knowledge on the potential effects of marijuana consumption on anesthesia needs and associated risks and complications. The purpose of this project was to assess if the use of multimedia education tools in the form of a video and digital handout about the anesthetic implications related to marijuana use would increase patient willingness to disclose marijuana use to anesthesia providers prior to receiving anesthesia.

By increasing patient knowledge, patients will hopefully be honest about their marijuana use during the preoperative period, so anesthesia providers are prepared to alter the anesthetic medications based on patient needs. Anesthesia providers should encourage open communication with patients and should incorporate asking patients about potential marijuana use during the preoperative assessment.

Utilizing evidenced based practice on the use of multimedia tools to deliver health information, this project utilized a video, digital handout, and post survey to increase patient knowledge on the importance of informing anesthesia providers of marijuana use and to encourage patients to inform providers before receiving anesthesia for surgery. Utilizing multimedia tools to disseminate this information is progressive today where virtual learning is becoming more popular in conventional learning institutions.

Strengths of the Project

The use multimedia educational tools were beneficial for this project. Due to the Covid-19 pandemic, Verilife prohibited all in-person programming, therefore, DNP students created a project that could be accessed virtually. Participants received all project materials through email where they were able to view and complete the survey at any time during the implementation period. By sending the project materials through email, participants had access to the information to refer to for information in the future and could print out the digital handout to provide information about their medical marijuana use to their providers. All project materials were accessible on electronic devices with internet access.

Limitations of the Project

Once the implementation period was completed, limitations of the project were analyzed. One major limitation was maintaining engagement during the implementation period. Due to the project materials being completely online, there was no way to ensure participants watched the video and completed the post-survey which hindered data results because all participants did not fill out the survey. Another limitation included the use of convenience sampling (PA Verilife customers) and a small sample size of 54 which does not allow generalizations of the results to all medical marijuana users. Finally, the length of the educational video was 14.5 minutes which is an extended period that may have presented a burden to full participation for Verilife customers. This may have limited completion of the survey by all participants.

Linkage to DNP Essentials

According to the American Association of College of Nursing (AACN), the DNP essentials outline the foundational competencies that define the roles of the doctoral prepared nurse (2006). Therefore, the DNP essentials were utilized to help develop and implement this project. Essential one defines the scientific underpinnings of practice which uses evidenced based practice to drive improvements in healthcare practice and delivery (AACN, 2006). Essential one has been displayed through this project with a comprehensive literature review to demonstrate the current evidenced based research on the effectiveness of utilizing multimedia tools (videos, etc.) for patient education and resultant patient outcomes. From the evidence collected from relevant research articles, a PICO question and completion of literature synthesis was conducted by doctoral students and approved by the DNP chairs at Cedar Crest College.

Essential two, described organizational and systems leadership for quality improvement and systems thinking (AACN, 2006). This DNP essential is important for improving patient and healthcare outcomes by working to eliminate healthcare disparities and promote patient safety through improvements in practice. The DNP students completed a needs assessment regarding medical marijuana use and anesthesia providers. It was identified there is a knowledge gap between anesthesia providers knowing about patient marijuana use. Some of the common reasons contributing to this gap included lack of documentation in medical record, patient denial, and marijuana use was not questioned in preoperative assessment. It was also identified many patients were unaware of the anesthetic implications of marijuana use as it relates to anesthetic needs intraoperatively,

and pain management. Stakeholders were identified and included DNP project chairs and mentors, and the CSM from Verilife. The stakeholders were essential to the development and implementation of this project as they offered continuous guidance, resources, budget planning and constructive criticism on elements of the project throughout the various phases of implementation.

The third DNP essential is clinical scholarship and analytical methods for evidenced based practice (AACN, 2006). This essential requires the doctoral prepared nurse to be competent in translation and evaluation of research into practice, participate in collaborative research, and make improvements in the reliability of healthcare practice and outcomes (AACN, 2006). This essential was met in phases throughout the project with the creation of the project proposal, Cedar Crest College IRB approval, implementation, and dissemination of the project. Throughout this process various changes were made to the project by DNP students under the direction of the DNP chairs and mentors associated with this project. The implementation and dissemination of this project took place over a four-week period where the project materials were distributed to PA Verilife customers through email and data was collected based on the eight question post-survey results (Appendix G). The progression of the project was documented throughout the scholarly paper, Typhon meeting logs, and an e-portfolio displaying the courses taken to satisfy each DNP essential.

Essential four, information systems, technology, and patient care technology for the improvement and transformation of health care describes how technology is used to improve patient care, healthcare systems and create leadership opportunities (AACN, 2006). This essential was met with the use of multimedia educational tools as a means of disseminating important information related to the importance of informing anesthesia providers of medical marijuana use prior to receiving anesthesia for any surgical procedure to avoid potential complications. The DNP students created an educational video, digital handout, and post survey that was distributed to the customers of the PA Verilife dispensaries via email through the company's list-serve. The survey results were filtered through Verilife's Google workspace account and all participant identifiers were removed posing no harm or breach in confidentiality to participants. Also, the readability and comprehension of all project materials were created at a sixth-grade literacy level. Finally, all project materials were distributed digitally because of Covid-19 restrictions on in-person programming.

Essentials five (policy and advocacy in healthcare) and six (interprofessional collaboration for improving patient and population health outcomes) occurred simultaneously. During the developmental stages of this project, it was important to build professional relationships with leaders in nurse anesthesia with expertise in marijuana use and anesthesia as well as clinicians with expertise in medical marijuana use and its health effects. Therefore, DNP students contacted the CSM from Verilife and Dr. Denise Tola DNP, CRNA, CHSE to serve as mentors and advocates for this project to provide information regarding evidenced based research and clinical expertise in medical marijuana use and anesthesia. DNP essential six was essential to the success of this project. Interprofessional collaboration between DNP students and key stakeholders allowed for the implementation of the project initially with the Verilife dispensary in Manayunk, Pa and then expanding it to all five Verilife dispensaries in Pennsylvania. This allowed DNP students to gain participation from different groups of people who use medical marijuana throughout the state. As a result, DNP students were able to incorporate demographic data into data analysis.

Essential seven describes clinical prevention and population health for improving the nation's health (AACN, 2006). This essential was met by creating multimedia educational tools demonstrating the importance of informing anesthesia providers of medical marijuana use preoperatively to decrease risk of complications associated with marijuana use and anesthetics. The project materials were implemented and disseminated to all Pennsylvania Verilife medical marijuana dispensaries and a post-survey was used to assess the effectiveness of utilizing multimedia educational materials to inform participants of the anesthetic implications of medical marijuana use. As a result, participants were more likely to inform anesthesia providers of their medical marijuana use prior to receiving anesthesia and can utilize the form on the digital handout to inform healthcare providers of the route, frequency, and type of marijuana used. This will lead to safer anesthetic management during the intraoperative period and effective postoperative pain management. Finally, DNP essential eight, advanced nursing practice, was met through disseminating an intervention based off current evidence-based practice on the effectiveness of multimedia educational tools and patient understanding of health information. The information provided in this project will be accessible to all participants and available to the dispensary for

future educational purposes. The ease of accessibility makes this project favorable for future expansion to other dispensaries for later DNP projects.

Chapter 8: Summary of Project

Conclusion

The use of multimedia tools is gaining increasing acceptance and popularity in the medical profession. Multimedia tools in the form of educational videos are effective methods to use in combination with traditional methods to ensure patient understanding of associated disease processes and/or surgical procedures. The use of visual aids is especially helpful in ensuring patient understanding for individuals with varying literacy levels. Based on the associated literature, it can be concluded that the use of multimedia educational tools are effective methods to enhance patient education and preparation for various surgical procedures. By understanding how marijuana use may affect the anesthetic needs for surgery, the associated changes to major organ structures, and growing acceptance of marijuana use with increasing legalization across the country, patients will have more confidence disclosing this information.

Based on the results of this project from the post-survey responses, participants agreed that the use of the educational video and digital handout created by DNP students were effective methods to increase knowledge of the anesthetic implications of medical marijuana. Most participants also expressed increased understanding of the importance of informing anesthesia providers about medical marijuana use prior to receiving anesthesia for surgery. Most importantly, majority of the 54 participants expressed increased willingness to inform anesthesia providers of their medical marijuana use during the preoperative period.

Dissemination Plans

Dissemination of this project was at Cedar Crest College on April 11th, 2022. The project was presented by DNP students and shared with other doctoral students, Cedar Crest faculty, DNP mentors, and the CSM from Verilife medical marijuana dispensary. The project was displayed through a PowerPoint and poster presentation. Attendance to the Cedar Crest College doctoral presentations was available for in-person and virtual attendance via Microsoft Teams.

Verilife dispensary expressed interest in expanding and continuing this project with other Verilife dispensary branches across the country. Due to Covid-19 restrictions, in-person programming was limited, but hopefully the project can be disseminated in the future. The project can easily be disseminated virtually using

current technology and the project materials (educational video and digital handout) can be distributed to all participants.

Future Implications

This project served as a stepping stone to increase interest, and education on the relationship between the physiologic effects of marijuana use and medications used to induce anesthesia for surgery. This project can be expanded in the future to include Verilife dispensaries in other states that will allow for more generalizable results. If continued, future DNP students can use the groundwork for this project to create valuable educational tools stemming from the results of this project. For example, most of the participants picked inhalational methods as their method of consumption of medical marijuana. Future projects could educate patients on safer methods of consumption such as oils or edibles that eliminate issues associated with hyperreactive airways due to inhalational methods.

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Appendix A. Evidence Synthesis
PICO Question: In patients who use medical marijuana, will a multimodal educational tool about the anesthetic implications related to marijuana increase their willingness to disclose marijuana use to a healthcare provider prior to receiving anesthesia?

Author & Date	Aim & Research Design	Sample Size, Population & Setting	Methods	Measures & Outcomes	Study Findings that Answer the PICO	Limitations	Evidence Rating	
							Level	Quality
Greene, K. A., Wyman, A. M., Scott, L. A., Hart, S., Hoyte, L., & Bassaly, R. (2017).	Aim: Evaluate the impact of a preoperative patient education video on patient preparedness for sacrocolpopexy measured by a preoperative questionnaire. Design: Single blind, randomized clinical trial	Sample size: 100 patients (52 randomized to video group, 48 to the usual care group) Population: Patients presenting for preoperative appointment before pelvic reconstructive surgery Setting: Female Pelvic Medicine and Reconstructive Surgery Clinic at a tertiary referral teaching hospital	-Preoperative patient education video as an adjunct to preoperative counseling on patient preparedness for surgery -Time frame April 1, 2013-July 1, 2015 -Protocol developed in accordance with "Consolidated Standards of Reporting Trials (CONSORT) guidelines -Subjects recruited from single academic institution-> Female Pelvic Medicine and Reconstructive Surgery Clinic -Inclusion criteria -> English speaking	-Standardized preoperative checklist -Length of time physician spent counseling patients -Preoperative preparedness questionnaire (PPQ) -SPSS software (paired t test to compare pre/post continuous variables, Student t test for continuous variables) -Primary outcome: patient preparedness for pelvic reconstructive surgery measured by PPQ question 11 increased. -Secondary outcomes:	-Patients expressed increased preoperative preparedness when given education prior to the procedure using the PPQ. -There was no statistical difference in patient understanding and compliance with preoperative guidelines group with education provided in-person versus online. -Questionnaire was an effective tool to assess patient understanding of procedure	-Did not reach anticipated sample size -Institution performed preoperative counseling with fellows, not generalizable -Population homogenous in race	Level I	Quality A

			females over 18 yrs. Presenting for preop evaluation -Informed consent -Random allocation using random number table generated by statistician, physicians blinded -10 min educational video shown to participants -Preop preparedness questionnaire given to patients after video	patient understanding of purpose, risks, benefits, alternatives, and complications of surgery increased.	and preparedness for surgery.			
Hsueh, F. C., Wang, H. C., Sun, C. A., Tseng, C. C., Han, T. C., Hsiao, S. M., … Yang, T. (2014)	Aim: Investigate effectiveness of an educational film intervention on quality of bowel cleanliness of outpatients receiving colonoscopy exams.	Sample Size: 218 (104-experimental, 114-control) Population: Patients who received colonoscopies Setting: local hospital in S. Taiwan	-Data collection from 1/11-4-11 -After scheduling of colonoscopies by physicians, patients invited to participate in study. -Patients scheduled on odd weeks assigned to experimental	-8 minute "Preparation for Bowel Cleanliness" educational film shown to experimental group -Aronchick scale used to evaluate bowel cleanliness	-Patient education increased preparedness and compliance for procedure.	-Unblinded assessment -Educational pamphlet only provided to experimental group -Educational films watched after doctors	Level II	Quality B

	Design: Quasi Experimental Design		group, patients scheduled on even weeks assigned to control group. -Control group received routine hospital care -Experimental group received routine care and watched "Preparation for Bowel Cleanliness" video in separate room. Experimental group patients were given educational handouts after watching video. -Inclusion criteria: outpatients receiving colonoscopy during research period, 20years+, demonstrated clear conscious and no hearing/visual impairments. -Exclusion criteria: patients	-Informed consent for all participants -Day of procedure questionnaire for demographic information -SPSS used for statistical analysis -Outcomes: Bowel cleanliness was better in the experimental group compared to the control group. -Patients with prior colonoscopy experience had increased bowel cleanliness (more in women than men).		visit → decreased attention		

			receiving painless colonoscopy (w/ sedation), inpatients, patients not using sodium phosphate as bowel cleanser, patients who could not comply.					
Lopez-Olivo, M.A., des Bordes, J.K.A., Lin, H., Rizvi, T., Volk, R.J., & Suarez-Almazor, M.E., (2020).	Aim: Compare the efficacy of adding a multimedia patient education tool involving video modeling to a printed educational booklet on osteoporosis. Design: RCT	Sample: 225 women with osteoporosis or osteopenia. Population: Post-menopausal women (50+ yrs. old, at least 3 years post menopause, English or Spanish speaking) with diagnosis of osteoporosis or osteopenia. -Patients recruited from five outpatient clinics in three Houston, Tx area medical facilities.	-Recruitment: Five outpatient clinics + advertisements in newspaper -Initial screening: review of medical records and screening over the phone -Selected participants completed baseline questionnaire then randomized into two groups based on language preference	-Primary Outcome Measure: Osteoporosis knowledge measured through modified "Osteoporosis Patient Knowledge Questionnaire" (17 questions relevant to the study) -Score ranges from 0 (lowest)-17 (superior knowledge) -Assessed at baseline, immediately post-	-Knowledge and decisional conflict improved from baseline and persisted at 6 months in both groups. -Neither of the educational materials proved to be better than the other at improving knowledge or decreasing decisional conflict. -Self-efficacy and effectiveness at disease self-	-Sample consisted of all willing patients, no comparison with patients who declined participation. -Unable to assess if participants referred to the educational materials later, unable to assess effects of repeated exposure.	Level I	Quality B

		Setting: Five outpatient clinics included in the study	-One group received only the pamphlet while other group watched educational video and received pamphlet, each group viewed educational materials in separate rooms -All participants completed post intervention survey -Follow-up questionnaires mailed to participants at three and six months with phone reminders	intervention, and 3 and 6 months -Secondary outcomes: decisional conflict about treatment choice, self-efficacy, and effectiveness in disease management -Secondary outcomes assessed using the low literacy version of the "Decisional Conflict Scale" Outcomes: -Knowledge improved from baseline to all evaluation time points in both groups -Changes in knowledge score from baseline to each evaluation time point were not different	management did not change with either educational tool. -There were statistically significant interactions between intervention and health literacy as adding the multimedia tool to the booklet increased decisional conflict in women with limited literacy.	-19% of treatment group and 13% of control group didn't return questionnaires at 6 months, responses were imputed.		

				between both groups -Total decisional conflict decreased from baseline to immediately post intervention and all time points after				
Huang, M.-C., Hung, C.-H., Yu, C.-Y., Berry, D. C., Shin, S.-J., & Hsu, Y.-Y. (2017).	Aim: Explore the effectiveness of two types of health education methods on improving knowledge concerning diabetes and insulin injection, insulin injection skills and self-efficacy, satisfaction with health education and HbA1c and creatinine levels among patients with type 2	Sample: 72 patients with type 2 diabetes Population: Taiwanese or Mandarin speaking patients with type 2 diabetes prescribed insulin injections wit naivety to Lantus Solostar and Levemir Flex Pen disposable pen injectors and the Novomix NovoPen four reusable pen injectors. Setting: Inpatient	-Data collection Oct. 2013-Aug. 2014 -Patients chosen based off inclusion criteria and equally split into experimental and control groups (n=36 per group) through random assignment -Experimental group viewed multimedia health education video, experimental group reviewed printed educational materials	-Demographic and disease characteristics-> demographic questionnaire -Knowledge of diabetes and insulin injection scale, an insulin injection skills scale, a self-efficacy in insulin injection scale and a satisfaction with health education scale. -Content validity assessed by panel of 8 experts Outcomes:	-Traditional methods to promote health education are ineffective alone. -Beneficial to utilize multimedia strategies to enhance healthcare education efforts.	-Data was collected from 1 hospital teaching hospital -Unable to make generalizable conclusions (education in study provided by diabetes educator but health education generally performed by inward nurses) -Participants were willing	Level I	Quality B

	diabetes who began insulin therapy using a pen injector. Design: Randomized repeated measures experimental study design.	teaching hospital in S. Taiwan	-Pretest: included a demographic questionnaire, the diabetes and insulin injection knowledge scale and the self-efficacy in insulin injection scale after they were videotaped for demonstrating insulin injection skills -Participants completed posttests on day prior to discharge, then 1st, 5th, and 13th weeks after discharge	-Experimental and control groups differed significantly with respect to diabetes and insulin injection knowledge ($P < 0{\cdot}01$), insulin injection skills ($P < 0{\cdot}01$), self-efficacy ($P < 0{\cdot}01$) and satisfaction with health education ($P < 0{\cdot}01$) at all time points -Hgb A1c and Cr levels were significantly lower in both groups at time period 5 compared to time period 1		to learn insulin injection, findings can't be generalized to patients not willing to learn		
Fahimi, K., Abbasi, A., Zahedi, M., Amanpour, F., & Ebrahimi, H. (2020)..	Aim: Determine the effects of multimedia education on postoperative delirium in patients undergoing a coronary artery bypass	Sample: 110 patients (Control group= 55 patients, Intervention group=55 patients) Population: Patients	-Informed consent obtained -Random assignment w/ quadruple blocking method -Patent demographic obtained before procedure	-Quantitative data: mean, standard deviation -Qualitative data: absolute and relative frequency - χ^2 and Fisher′s exact tests used	-Patients in control group experienced higher incidences of delirium -Multimedia education methods were effective	-Possibility of obtaining information from other resources by patients and the probability of data leakage from the	Level I	Quality A

	graft (CABG). Design: single blind RCT	undergoing CABG procedure for first time w/o development of postoperative cardiogenic shock or myocardial rupture. Setting: Imam Hossein Hospital of Shahroud University of Medical Sciences	-intervention group received multimedia CD containing 3 short educational videos 5-7 days before procedure -Control group received routine care without educational videos -Random assignments based on prespecified random sequence, concealed using sealed envelopes.	for comparison of proportions	decreasing rates of delirium in the postoperative period.	intervention group to the control group in the ward. -Differences in nursing care/communication throughout the stay in ICU. -Patient influencers: social support, impact of other sources of information (internet, friend, family), and anxiety.		

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Appendix B: John Hopkins Evidence Level and Quality Guide

Johns Hopkins Nursing Evidence-Based Practice
Appendix C: Evidence Level and Quality Guide

Evidence Levels	Quality Guides
Level I Experimental study, randomized controlled trial (RCT) Systematic review of RCTs, with or without meta-analysis	**A** **High quality:** Consistent, generalizable results; sufficient sample size for the study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence
Level II Quasi-experimental study Systematic review of a combination of RCTs and quasi-experimental, or quasi-experimental studies only, with or without meta-analysis	**B** **Good quality:** Reasonably consistent results; sufficient sample size for the study design; some control, fairly definitive conclusions; reasonably consistent recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence
Level III Non-experimental study Systematic review of a combination of RCTs, quasi-experimental and non-experimental studies, or non-experimental studies only, with or without meta-analysis Qualitative study or systematic review with or without a meta-synthesis	**C** **Low quality or major flaws:** Little evidence with inconsistent results; insufficient sample size for the study design; conclusions cannot be drawn

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Appendix C: Table 2. Qualifying Conditions

Amyotrophic lateral sclerosis (ALS)
Anxiety disorders
Autism
Cancer, including remission therapy
Crohn’s disease
Damage to the nervous tissue of the central nervous system (brain-spinal cord) with objective neurological indication of intractable spasticity, and other associated neuropathies
Dyskinetic and spastic movement disorders
Epilepsy
Glaucoma
HIV/AIDS
Huntington’s disease
Inflammatory bowel disease
Intractable seizures
Multiple sclerosis
Neurodegenerative diseases
Neuropathies
Opioid use disorder for which conventional therapeutic interventions are contraindicated or ineffective, or for which adjunctive therapy is indicated in combination with primary therapeutic interventions
Parkinson’s disease
Post-traumatic stress disorder (PTSD)
Severe chronic or intractable pain of neuropathic origin or severe chronic or intractable pain
Sickle cell anemia
Terminal illness
Tourette syndrome

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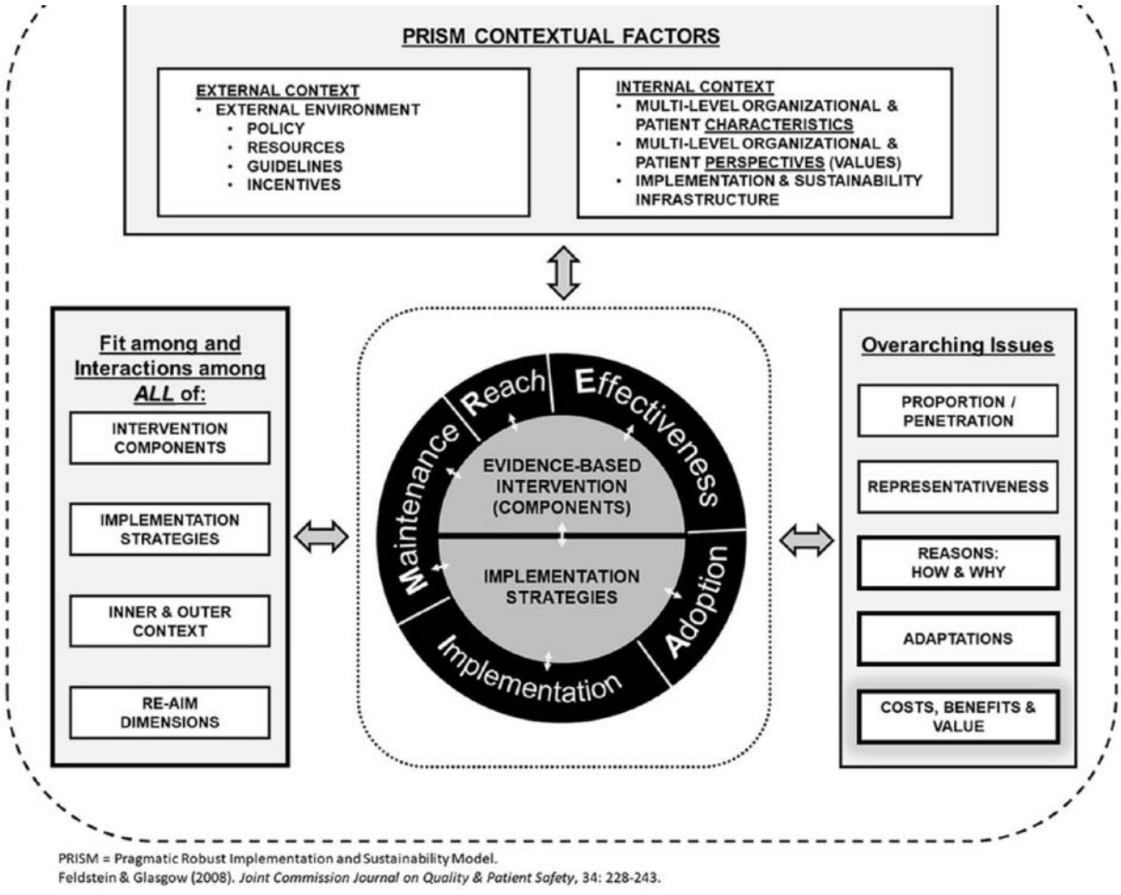
Appendix D: Video Description

The purpose of this video is to provide a visual presentation presented by individuals (DNP students) acting out different scenarios that could potentially occur in the clinical setting (before, during, and after surgery) with patients who regularly use marijuana. The focus of the project will discuss potential changes in anesthetic requirements and pain management methods for these patients.

The clinical based simulation rooms at Cedar Crest College will be utilized to record the video. The video will start in the preoperative setting and demonstrate a standard preoperative interview with an anesthesia provider asking about marijuana use. The patient who regularly consumes marijuana will state they do not use marijuana or any other drugs and will consent to the scheduled procedure. The next part of the video will demonstrate the anesthetic management of the patient in the operating room starting from induction of anesthesia to the end of the procedure where the patient is awakened from general anesthesia. The video will briefly demonstrate dialogue between anesthesia providers noting that the patient required increased anesthetic medications to put the patient to sleep and increased pain medication once the patient was awakened from the anesthesia. The scenario will end with the patient experiencing increased pain and discomfort in the post-operative period.

The second part of the video will quickly demonstrate the same scenario starting from the pre-operative period to postoperative period. The difference will demonstrate the patient informing the anesthesia provider of their marijuana use during the pre-operative interview. This information will allow the anesthesia provider to make an informed decision on the appropriate anesthetic and pain management requirements needed for this patient. The outcome will demonstrate the patient receiving increased anesthetic medications for induction demonstrated in the first scenario, but the anesthesia provider will also know to incorporate different medications that alleviate pain early on during the surgery to avoid increased discomfort in the postoperative period. The anesthesia provider can also inform the nurses and physicians that will care for the patient after the procedure about the patient's marijuana use and the potential for increased pain medication needs as a result. This will lead to decreased complications associated with wound healing, stabilization of vital signs (blood pressure, heart rate, respiratory rate), and overall patient satisfaction. The video will conclude with the DNP students briefly summarizing the purpose of the video and what it represented, the importance of informing providers of marijuana uses prior to surgery, the how marijuana can alter anesthetic and pain management needs, and what patients may experience in the post-operative period.

Appendix E: RE-AIM Framework



Reference

RE-AIM (2019). RE-AIM at 20: RE-AIM planning and evaluation framework: Adapting to new science and practice with a twenty-year review. https://www.frontiersin.org/articles/10.3389/fpubh.2019.00064/full

Appendix F: Informed Consent

- The consent form will be attached to an email along with the multimedia educational program and survey.

Directions for participation: Prior to completing the survey, participants will be instructed to view the video describing how marijuana use can affect anesthesia requirements during surgery. The multimedia educational tools will be sent to Verilife customers via email. The digital handout will be a written summary of the information portrayed in the video so participants can easily access the information. After viewing the video, participants will be instructed to complete a short survey about their willingness to inform their anesthesia providers about their marijuana use. Completion and submission of the online survey is an indication of consent to participate in this DNP project.

Informed Consent

As a current customer of the Medical Marijuana dispensary, Verilife, you are invited to participate in the DNP Project titled "*Implementation of Multimedia Educational Tools to Increase Patient Willingness to Disclose Medical Marijuana Use to Anesthesia Providers Prior to Receiving Anesthesia."* You will view a video that discusses how medical marijuana use can affect anesthesia needs during surgery or a procedure and the importance of informing your anesthesia provider prior to receiving anesthesia. All participants are required to be 18 years of age or older to participate in this DNP project.

Due to the COVID-19 Pandemic, all research projects must follow the health and safety guidelines developed by Cedar Crest College. These guidelines are aligned with those of the CDC and state and local health authorities. When possible, it is recommended that research be carried out with the use of online survey tools (Survey Monkey or Microsoft Forms). If in-person research is conducted these health and safety guidelines must be followed to protect all human participants and all researchers.

Health Services | COVID_19 Information (cedarcrest.edu)

This DNP project will be conducted by Bre'Yana Gibson BSN, RN, CCRN and Alexandra Nowicki BSN, RN, CCRN, senior nurse anesthesia students at Cedar Crest College in Allentown, Pennsylvania.

Background Information

As of April 2021, 36 states have approved marijuana for medical use and 17 states have approved it for recreational use. Due to the inconsistencies in legality and the stigmas related to marijuana, many patients do not disclose their use to a healthcare provider for many reasons, such as, a fear of being judged, a lack of support, or risk to their employment. However, patient's lack of honesty and communication to their anesthesia provider can increase their risk for avoidable anesthetic complications, like cardiac arrest, airway compromise, interactions with other drugs, and inadequate pain control. Before undergoing a procedure or surgery, a marijuana user should tell their anesthesia provider about their consumption so appropriate anesthetic considerations and alterations can be made throughout the preoperative, intraoperative, and postoperative period.

The purpose of this DNP project is to assess your willingness to disclose your medical marijuana use with an anesthesia provider after viewing the multimedia educational tools. You will be asked to view a video that discusses the potential complications of marijuana use and anesthesia. A digital handout will also be provided that includes a summary of the information presented in the video. The information collected from the survey results will be analyzed to determine if the use of multimedia educational tools will increase your willingness to disclose medical marijuana use to an anesthesia provider prior to receiving anesthesia.

Procedure

Along with the multimedia educational tools and the informed consent form, a survey link will be provided to you via email. After viewing the multimedia educational tools, you will be asked to participate in the short survey to assess your willingness to report medical marijuana use to your anesthesia provider. By completing the survey, you have given your consent to participate in this DNP project. Participation in this

entire DNP project (viewing the multimedia educational tools and completing the survey) should not take longer than 15-20 minutes. Your participation will remain completely anonymous.

Risks and Benefits

It is anticipated that you will be at no physical, psychological, or emotional risk at any time during participation in this DNP project. Nor is it anticipated that participation in this DNP project will place you at any risk of criminal or civil liability or damage your financial standing or employability. In addition, participation will not affect your accessibility to medical marijuana. Throughout your participation in this DNP project, you will remain free from any judgement or stigma associated with your marijuana use. The education you will receive via the multimedia educational tools will hopefully encourage you to disclose your marijuana use prior to receiving anesthesia, therefore, reducing your risk of anesthetic complications. Thus, a direct benefit associated with participation in this DNP project is your improved safety while you are receiving anesthesia.

Confidentiality

Responses to the survey are completely anonymous, and all physical and non-electronic media data (e.g., video or audio tape) collected in this DNP project will be stored in a secure database managed by Verilife. All responses will be stored in password protected computers where the passwords are known only to the Clinical Services Manager and members of the Verilife team. Data will be stored for a period of three years, and shall be shredded, erased, or otherwise destroyed on or after December 2024.

Right to Withdraw

If you decide to participate, you are free to withdraw at any time. Your decision whether or not to participate will not affect your current or future relations with Cedar Crest College or with Verilife Medical Marijuana dispensaries.

Statement of Approval

This research was approved by Cedar Crest College's Institutional Review Board.

Proposal # 380 Date: (12/01/2021)

Contacts and Questions

The supervising advisors conducting this study are Catherine Zurawski DNP, CRNP, FNP-C (Catherine.Zurawski@cedarcrest.edu) and David Holland Ph.D., CRNP (David.Holland@cedarcrest.edu); if you have questions, you may contact the DNP advisors. Any questions you may have regarding the use of human subjects may be directed to the Institutional Review Board Chair, Thomas H. Pritchett, Chair (thpritch@cedarcrest.edu).

Appendix G: DNP Survey Questionnaire on Medical Marijuana Use

Completion and submission of this online survey is an indication of your consent to participate in this study.

1. Gender
    a. Male
    b. Female
    c. Other
2. Age (years)
    a. 18-30
    b. 30-40
    c. 40-50
    d. 50+
3. Location
    a. Philadelphia
    b. Chester
    c. Shamokin
    d. Williamsport
4. Method for Cannabis Consumption
    a. Inhalational (smoking)
    b. Oral (marijuana infused food)
    c. Sublingual
    d. Topical (lotion, creams, ointments)

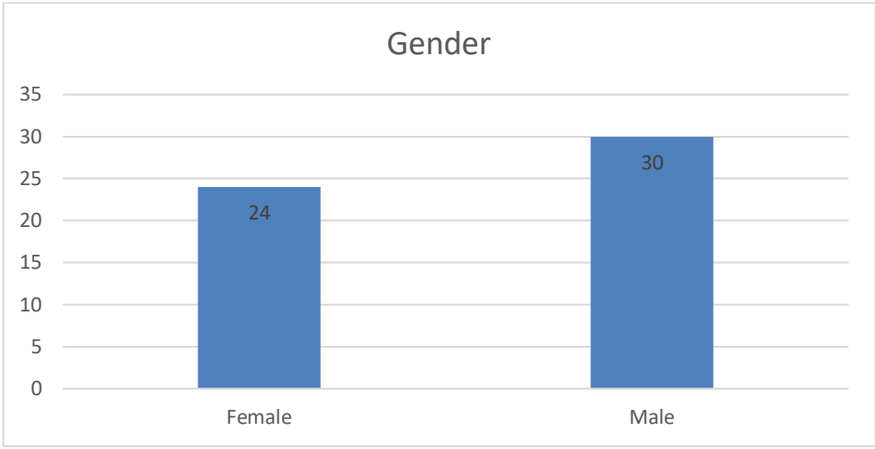
5. In the past 30 days how many days did you use marijuana?
    a. 0-5
    b. 5-10
    c. 10-20
    d. 20-30

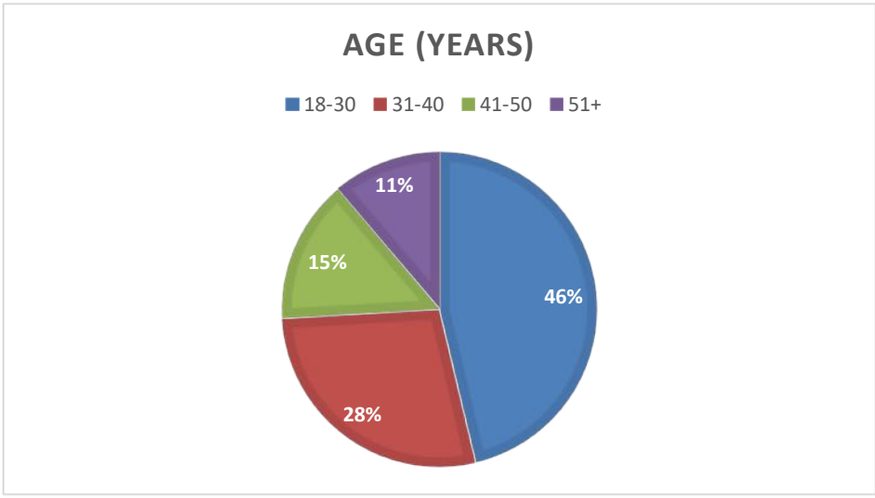
6. If you require surgery, would you have any hesitation in disclosing your marijuana use to the anesthesia provider for any of the following reasons?
    a. Do not want marijuana use on medical record
    b. Employment purposes
    c. Fear of judgement
    d. Other

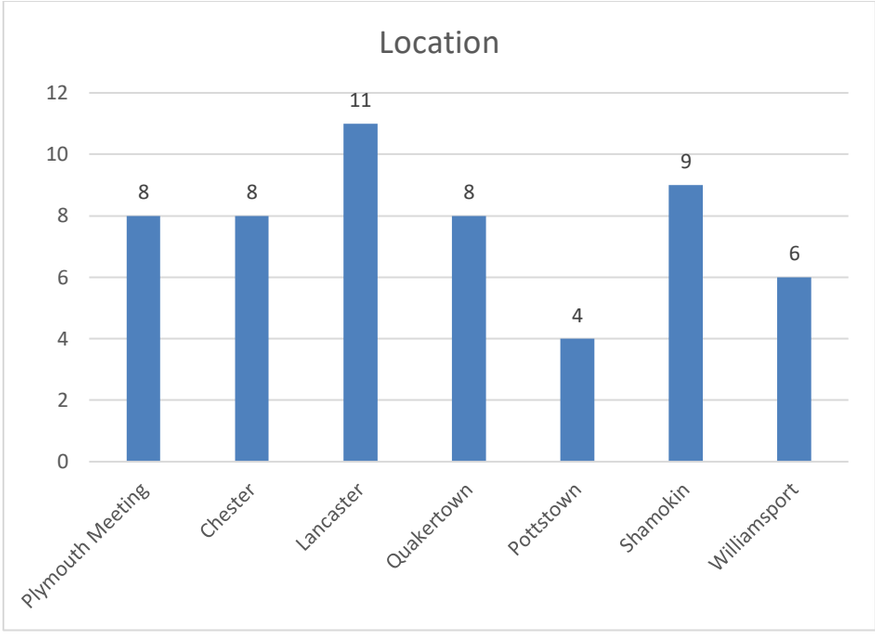
7. After watching this presentation, do you have a better understanding of the importance of disclosing this information with your anesthesia provider(s)?
    a. Yes
    b. No

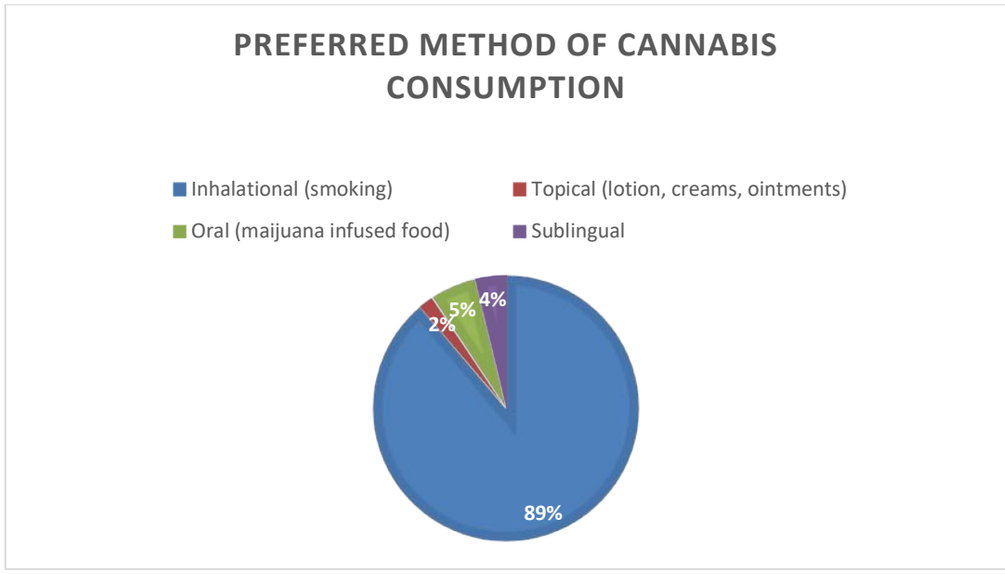
8. If you require surgery, will you inform your anesthesia provider(s) of your marijuana use?
    a. Yes
    b. No

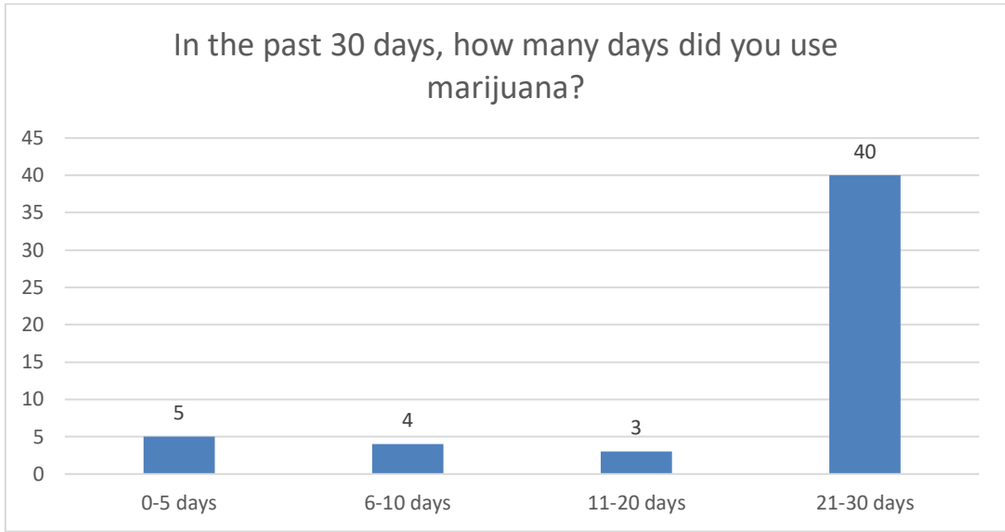
Appendix H: Data Analysis (Descriptive Statistics)

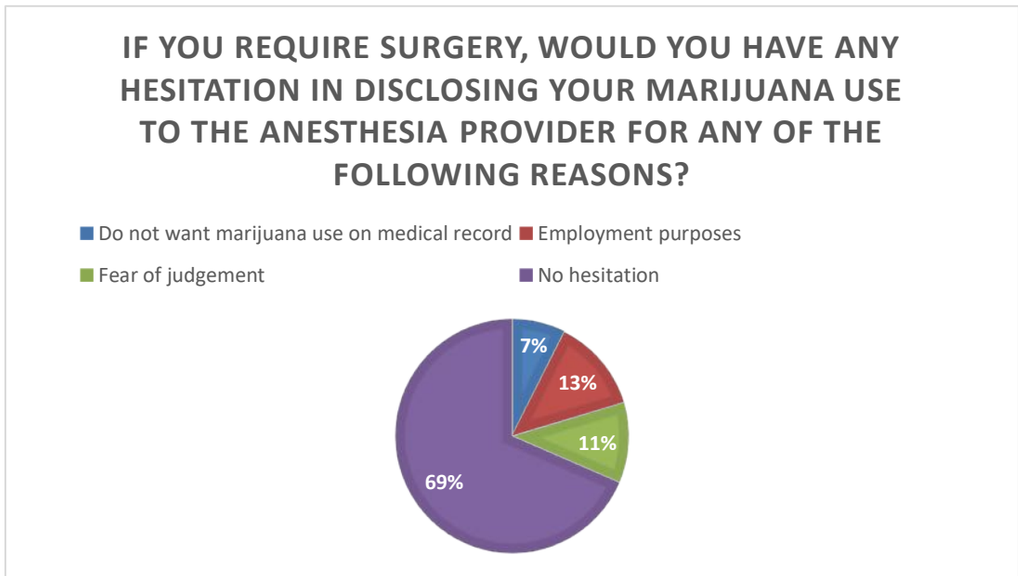


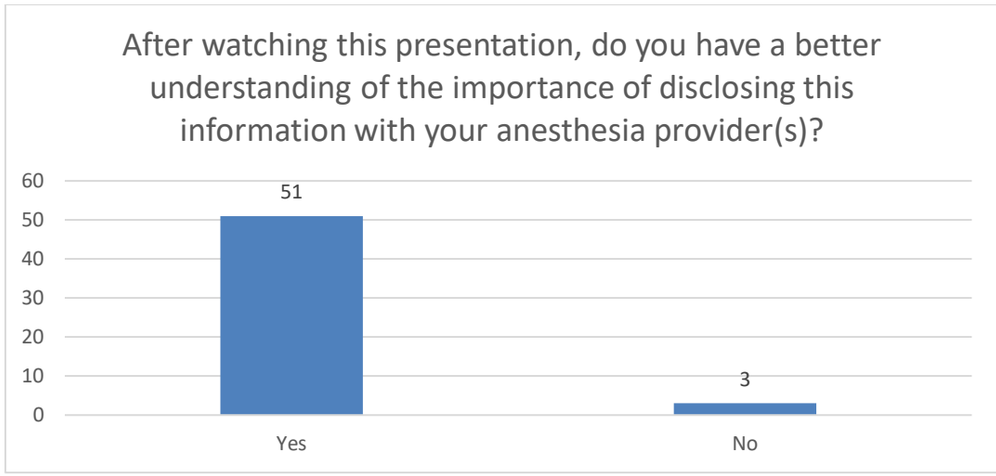


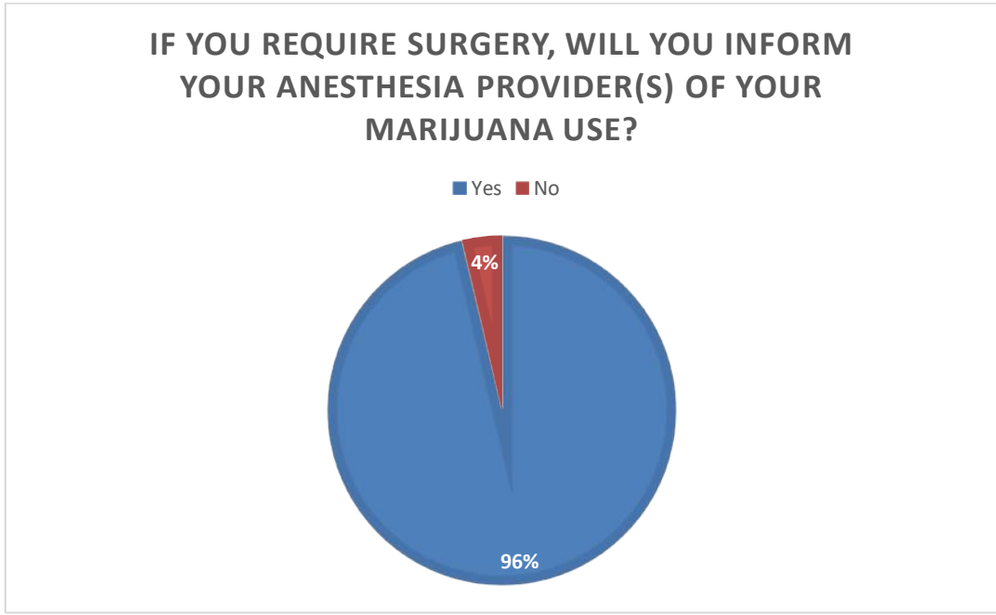



PREFERRED METHOD OF CANNABIS CONSUMPTION
Inhalational (smoking)
Topical (lotion, creams, ointments)
Oral (maijuana infused food)
Sublingual
4%
5%
2%
89%


In the past 30 days, how many days did you use marijuana?
45
40
35
30
25
20
15
10
5
0
5
4
3
40
0-5 days
6-10 days
11-20 days
21-30 days


IF YOU REQUIRE SURGERY, WOULD YOU HAVE ANY HESITATION IN DISCLOSING YOUR MARIJUANA USE TO THE ANESTHESIA PROVIDER FOR ANY OF THE FOLLOWING REASONS?
Do not want marijuana use on medical record
Employment purposes
Fear of judgement
No hesitation
7%
13%
11%
69%


After watching this presentation, do you have a better understanding of the importance of disclosing this information with your anesthesia provider(s)?
60
50
40
30
20
10
0
51
3
Yes
No


IF YOU REQUIRE SURGERY, WILL YOU INFORM YOUR ANESTHESIA PROVIDER(S) OF YOUR MARIJUANA USE?
Yes
No
4%
96%