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# Dental Hygienists' Knowledge of Medical Marijuana: A Survey

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# DENTAL HYGIENISTS' KNOWLEDGE OF MEDICAL MARIJUANA: A SURVEY

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THESIS

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## DEDICATION

This body of work is dedicated to my loving and amazing family. My beautiful children, my husband, my parents and siblings have been the key to my success. They have always showed me patience, support and have never let me quite on my dreams.

To my professors and instructors thank you for all your mentoring, because of your love for teaching and hygiene I have a passion for patient care, could not have been the hygienist I am today without you.

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## ABSTRACT

Cannabis consumption is at an all-time high in the United States. Due to its fast growth in the medical industry and the lack of FDA approval, research is very limited. Dental hygienists' will likely encounter a patient under the influence of this substance in the dental office. To provide the best quality of care, the dental hygienist must be aware of the oral implications, side effects and necessary modifications to treatment. Therefore, dental hygiene providers must be knowledgeable on medical marijuana to have discussions with patients when needed. Due to scarce research on the topic it makes it difficult to determine if a relationship between the dental hygienist knowledge and the comfortability in treating a patient on medical marijuana exists.

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# CHAPTER I

## INTRODUCTION

Recent reports indicate there are 2.2 million registered medical marijuana users in the United States. (1) Twenty-eight states, including the District of Columbia, Guam and Puerto Rico allow for comprehensive public use of medical marijuana. The industry of medical marijuana or medical cannabis is new, but its use in medicine can be dated back to 2900 BC in China where it was first used as an anesthetic. Today, the most common reason patients seek medical marijuana, is for the management of chronic pain. (2) Although the number of people who seek this treatment modality for relief of chronic pain is rising annually, the FDA has not approved medical marijuana as a safe and effective drug for any indication. The agency however, approved two drugs containing a synthetic version of a substance that is present in the marijuana plant and one other drug containing a synthetic substance that acts similarly to compounds from marijuana but is not present in marijuana. The FDA is aware that there is considerable interest in its use to attempt to treat many of medical conditions, for example, glaucoma, AIDS wasting syndrome, neuropathic pain, cancer, multiple sclerosis, chemotherapy-induced nausea, and certain seizure disorders. (3)

Medical marijuana use is on the rise, regardless of limited studies involving long-term use of the marijuana. Studies have correlated side effects that can occur to the cardiovascular and respiratory system almost immediately when consumed. Dental providers should be knowledgeable on the topic due to oral implications that medical marijuana can cause, such as xerostomia. Studies showing dental providers knowledge

on medical marijuana are scarce therefore, making it difficult to determine dental hygienists' knowledge and comfort when treating patients who use marijuana.

**Purpose**

The purpose of this study is to evaluate dental hygienists' knowledge of laws, indications, uses, interactions, and side effects of medical marijuana. The association between the knowledge and the comfortability in treating a patient on medical marijuana is also assessed.

**Statement of the Problem**

The use of medical marijuana is widespread and evidence shows its use has a negative impact on oral health. (4) Therefore, dental hygiene providers must be knowledgeable on medical marijuana to have discussions with patients when needed. Scarce research on the topic makes it difficult to determine if a relationship between the knowledge and the comfortability in treating a patient on medical marijuana exists.

**Significance of the Problem**

According to the 2013 National Survey on Drug Use and Health, marijuana is the most commonly used illicit drug, with 19.8 million past-month users. (5) Dental hygienists' will likely encounter patients under the influence of this substance in the dental office. To provide the best quality of care, the dental hygienist must be aware of the oral implications, side effects and necessary modifications to treatment. Patients expect evidence-based practice from their healthcare professionals, which includes

providing accurate drug/medication information. Dental hygienists must educate themselves on medical marijuana and the fast-growing industry. The more knowledgeable dental hygienists are regarding medical marijuana, the easier it can be to address patient needs or modify treatment if necessary.

# CHAPTER II

# LITERATURE REVIEW

## Introduction

Cannabis consumption is at an all-time high in the United States. (6) Due to its fast growth in the medical industry and the lack of FDA approval, research is very limited. Studies involving medical providers and their knowledge towards marijuana are very limited. One study in Victoria assessed 302 nurses' knowledge, attitudes, beliefs and practices regarding substance use. Many participants indicated that they believed it was mostly young people who are using this drug and that marijuana is a gateway drug to other illicit drugs. Nurses in this study were concerned with the adolescent health risks of marijuana use, and many considered marijuana to have the same health risks as cigarettes and other combustible tobacco products. (7)

## Medical Marijuana

Cannabis preparations are derived from the hemp plant, Cannabis sativa, which contains 460 known compounds called cannabinoids, 60 of which are unique to the plant and contain a primary active chemical, d-9-tetrahydrocannabinol (THC) shown to have psychoactive properties. Marijuana, hashish, and hash oil are three types of cannabis. Marijuana (0.5% to 5% THC) is the most common and least concentrated form, followed by hashish (2% to 20% THC), and hash oil (15% to 50% THC), which is the most concentrated and potent form. Marijuana is more commonly known for smoking purposes and hashish is used for mixing in food. (4)

Marijuana is referred to by a variety of names, including pot, cannabis, weed, hemp, hash. Patients that are using Marijuana for medical purposes are less likely to disclose its use on a medical history form. This may be caused by the way global medical and dental history forms lump substance abuse into one category. A prime example "Are you a substance abuse user" is among the many questions used on a medical history form, which could hinder a patient's discloser. (8)

The main active ingredient in cannabis is delta-9 tetrahydrocannabinol, commonly known as THC. This is the part of the plant that gives the "high". There is a wide range of THC potency between cannabis products. THC is found in resin produced by the leaves and buds primarily of the female cannabis plant. The plant also contains more than 500 other chemicals, including over 100 compounds that are chemically related to THC, called cannabinoids. There are currently two U.S. Food and Drug Administration (FDA) approved cannabinoids available in the United States: Dronabinol and Nabilone. (9)

According to the State Medical Marijuana Laws, there are 29 states with legal use of medical marijuana. Although the approved conditions of medicinal marijuana vary from state to state, there are many Americans using medicinal marijuana as an alternative to traditional pain relievers (10)

**FDA Approved**

Medical marijuana is not legal under federal law but there have been two chemically pure drugs based on marijuana compounds that have approval in the US for medical use. Dronabinol (Marinol ®) is a gelatin capsule containing delta-9-tetrahydrocannabinol (THC) that has approval by the US Food and Drug Administration

(FDA) to treat nausea and vomiting caused by cancer chemotherapy as well as weight loss and poor appetite in patients with AIDS. Nabilone (Cesamet ®) is a synthetic cannabinoid that acts much like THC. Nabilone can be taken by mouth to treat nausea and vomiting caused by cancer chemotherapy when other drugs have not worked.

**Medical Marijuana Use**

Pain is the main reason people ask for a prescription, says Barth Wilsey, MD, a pain medicine specialist at the University of California Davis Medical Center. It could be from headaches, a disease like cancer, or a long-term condition, like glaucoma or nerve pain. (11) Several studies in the general population and specific disease populations have found that anxiety, stress, pain, depression, nausea, appetite stimulation, sleep improvement, alleviation of muscle spasms, spasticity, facilitation of pleasure and partying are commonly given as reasons for using cannabis. (12)

Just like any other medication, medical marijuana also has a purpose or a goal. This differentiates depending on the reasons a patient might be taking marijuana. For nausea relief, the objective is to help ease the nausea and vomiting that chemo-bound cancer or AIDS patients' experience. Smoking or vaporizing cannabis allows the THC to enter the bloodstream much faster and as a result, it inhibits nausea and settles the stomach within moments. (9) To relieve nerve pain, the objective is to help quell the burning in the feet and hands caused by diabetes, AIDS, spinal cord injuries, and other conditions. Cannabis is highly effective at relieving neuropathic pain. (9) The two major cannabinoids found in cannabis, tetrahydrocannabinol (THC) and cannabidiol (CBD), activate the two main cannabinoid receptors (CB1 and CB2) of the endocannabinoid

system within the body. These receptors regulate the release of neurotransmitter and central nervous system immune cells to manage pain levels. Patients use medical marijuana for multiple sclerosis to control the debilitating muscle spasms and stiffness, which interfere with sleep and even walking. (13) Patients with epilepsy use medicinal marijuana to reduce the number of seizures in children and adults with Dravet Syndrome and Lennox-Gastaut Syndrome, types of epilepsy that are difficult to control with current medications. (14) In addition to pain control, patients receiving cancer treatment use medicinal marijuana in hopes of slowing or halting the growth of cancer cells. (15) For post-traumatic stress disorders, medicinal marijuana can ease nightmares and other symptoms. Patients suffering from Parkinson's disease use medicinal marijuana to reduce the tremors in this nervous system disorder as well as stiffness in the arms and legs.

The most common reasons patients are requesting medicinal marijuana is general chronic pain and anxiety. Medicinal marijuana is said to ease the pain from cancer and other conditions like severe headaches, arthritis, and some kinds of back injuries that are not nerve-related. (16) For anxiety, it can reduce stress in social situations. (2)

**Risks and Limits**

Medical marijuana is not monitored like FDA-approved medicines therefore, purity, potency, and side effects can be unknown to the user. Only those who have obtained a medical marijuana card from a doctor can use it legally. Doctors will not prescribe it to anyone under 18 and advise those with heart disease, pregnant women and people with a history of psychosis against its use.

**Mechanism of Use**

Some people smoke marijuana in hand-rolled cigarettes called joints; many use pipes, water pipes, sometimes called bongs. Marijuana is also be used to brew tea, and particularly when it is sold or consumed for medicinal purposes, is frequently mixed into foods (edibles) such as brownies, cookies, or candies. It may be smoked, vaporized (heated until active ingredients are released, but no smoke is formed), eaten (usually in the form of cookies or candy), or taken as a liquid extract.

**Side Effects**

Reported side effects of marijuana, although not likely to last long include dizziness, drowsiness, short-term memory loss, euphoria. Serious side effects include severe anxiety and psychosis. Short-term effects of marijuana can include the following: feeling of well-being, talkativeness, drowsiness, decreased nausea, increased appetite, loss of coordination, bloodshot eyes, dryness of the eyes, mouth, and throat. Since medicinal marijuana has not been legal for many years, there is limited research on the long-term effects of cannabis. Using the available evidence, the major probable adverse effects are those to the cardiovascular system and respiratory system.

**Cardiovascular System**

"The THC found in cannabis has shown to consistently increase the heart rate, during the initial period of cannabis use, through the inhibition of vagal stimulation via interactions with neurotransmitters such as acetylcholine. In contrast, bradycardia may be

induced in some regular cannabis users further emphasizing the complex effect of THC on the body". (17) The acute effect of THC on the cardiovascular system include dose-related tachycardia of up to 50% with widespread vasodilation. An elevated heart rate increases cardiac workload and myocardial oxygen demand. This can result in cardiac ischemia in susceptible individuals. The concentration of carboxyhemoglobin from absorbed carbon monoxide is high because of the smoking pattern of deep inhalation and long inspiratory time. This also decreases the oxygen levels to the heart. (18) (19)

**Respiratory System**

Cannabis use, like tobacco smoking, has a significant impact on the respiratory system. There have been studies that describe the similarities in carcinogenic chemicals between cannabis and tobacco. (20) The effects of cannabis use on the respiratory system are mainly associated with long-term smoking. The smoke from a cannabis cigarette has the same contents as tobacco smoke except the nicotine. This includes carbon monoxide, bronchial irritants, tar and higher levels of other carcinogens. (21) Chronic smokers of cannabis have increased symptoms of bronchitis, including coughing, wheezing and sputum production, and emphysema. The pulmonary effects of long-term use of 3-4 marijuana cigarettes a day is equivalent to smoking 20 or more tobacco cigarettes a day. This difference relates to the differing pattern of smoking (deep inhalation) and the absence of a filter in marijuana cigarettes. Smoking one marijuana cigarette results in the inhalation of three times the amount of tar, and one-third more tar retained in the respiratory tract compared to one tobacco cigarette. (22) Alveolar macrophages, the key cells in respiratory defense, are found in greater numbers in marijuana smokers. (22)

However, their ability to phagocytose is impaired, predisposing the individual to respiratory infections.

**Medical Marijuana and Dental Implications**

Generally, cannabis users have poor oral health compared to non-users, with higher DMFT index scores, higher plaque scores and less healthy gingiva. (23) Periodontal disease is one of the most common chronic diseases in adults. (23) Shariff conducted a study to determine the relationship between frequent recreational cannabis use and periodontitis in adults. Deidentified data from the 2011 to 2012 National Health and Nutrition Examination Survey were analyzed to assess the relationship between use of recreational cannabis (marijuana and hashish) and periodontal disease among adults aged 30 years or greater living in the United States. The analytical sample consisted of NHANES participants including 980 males and 958 females' ages 30 to 59 years. The mean age was 44.5 years, information on cannabis (marijuana and hashish) use, and additional co-variates including demographics such as, age, sex, race/ethnicity, family income, additional risk factors (diabetes mellitus [DM], tobacco and alcohol use), and data on history of periodontal treatment within the year preceding oral examination. Probing depth (PD) and clinical attachment loss (AL) measurements were obtained from the examination section of the 2011 to 2012 NHANES database. These measurements were recorded at six sites per tooth, mesio-, mid-, and disto-buccal; mesio-, mid-, and disto-lingual) for all teeth, excluding third molars. Periodontitis was examined using continuous and categorical measures. Continuous measures include the mean number of sites per participant with PD $\geq$4, $\geq$6, and $\geq$8 mm;

and the mean number of sites per participant with AL ≥3, ≥5, and ≥8 mm; and the pattern of AL in the entire dentition as well as by sextant, to examine potential differential effects in anterior versus posterior teeth. Participants were categorized if they were frequent recreational uses (FRC) by the following questions. 1) ‘‘Did you ever use marijuana or hashish?’’; and 2) ‘‘Did you use marijuana or hashish every month for a year?’’. Respondents who used marijuana or hashish once or more than once per month for the last 12 months were categorized as frequent recreational cannabis (FRC) users, and those who did not use marijuana and hashish or reported to use marijuana or hashish fewer than once per month in the past year were categorized as non-FRC users. Data revealed that FRC users exhibit deeper PDs, higher AL score, and higher odds of having severe periodontitis than non-FRC users. FRC use in absence of tobacco smoking appears to have adverse effects on periodontal tissues. (24)

Another study, done over a period of 15 years, asked participants how many times in the previous year they had used cannabis at ages 18, 21, 26, and 32 years. The study's demonstration of a strong association between cannabis use and periodontitis experience by age 32 years indicates that long-term smoking of cannabis is detrimental to the periodontal tissues and that public health measures to reduce the prevalence of cannabis smoking may have periodontal benefits for the population. (25) The results obtained showed that cannabis users brushed their teeth less frequently than the control group. In addition, the control group visited their dentist more regularly whereas only 21% in the test group visited their dentist annually. This study also established that cannabis users generally experienced dry mouth for approximately 1-6 hours after the use of cannabis. (26)

**Xerostomia**

Saliva protects the underlying mucosa from frictional damage. It is also an essential buffering system involved in protecting the oral cavity, especially the teeth, from dental diseases such as caries. A study conducted by Darling, which aimed to determine the oral effects of cannabis, found that xerostomia was experienced by 69.6% of its participants after smoking cannabis, compared to 18.6% of the cigarette smoking control group. (27) Another similar study, Di Cugno found the number of decayed teeth among cannabis users to be 2.5 times higher than that of controls, which made the overall DMFT index in their study statistically significant. Even though these studies were conducted several years ago, their findings highlight the oral health status of cannabis users. Further studies are required to look specifically at the DMFT value of cannabis users today. (28)

**Local Anesthesia**

Many individuals commonly report anxiety during dental visits, specifically those receiving local anesthesia. Twenty-five percent of adults express anxiety when receiving dental injections. (29) To compensate for this fear, a patient may use recreational or medicinal marijuana to feel relaxed and help with anxiety. The safety of local anesthetics when the patient is under the influence of marijuana may be of concern to providers: but local anesthetics, analgesics and the antibiotics commonly used in dentistry do not interact with cannabis. (29) Marijuana is a central nervous system depressant rather than a stimulant. (30)

**Provider Knowledge**

There is evidence to show that cannabis has a negative effect on oral health; however, further studies are required with reduced confounding factors to show more accurate findings. With further studies, dental providers will have the information to inform patients of any dental contraindications. Dental professionals are likely to encounter cannabis users frequently throughout their working career. Therefore, they must be prepared and confident in discussing the effects of cannabis use on oral and general health and be able to either provide or direct patients to a support program that addresses the social habits. (31)

Health care providers, have an obligation to be educated and informed on topics that can affect patients' wellbeing. Studies related to provider knowledge on the topic were hard to obtain especially those to pertaining to dentist or dental hygienists. A questionnaire on nurses' knowledge, attitudes, beliefs and practices regarding substance use was distributed to 302 nurses in Victoria. One hundred and thirty-four returned the questionnaire, giving an overall response rate of 44.3%. (7) The survey results showed that although knowledge and skill gaps exist in assessment and management of alcohol and drug problems, overall knowledge levels were adequate. Although positive attitudes towards substance use were expressed, specific educational programs to enhance nurses' skills in assessment and management of substance-related disorders may be beneficial. (7) Many participants indicated that they believed that it was mostly young people who are using this drug and that marijuana is a gateway drug to other illicit drugs. Participants spent most of the time discussing the various health risks that are associated with

marijuana use. Many were concerned with the adolescent health risks of its use, and many considered marijuana to have the same health risks as cigarettes and other combustible tobacco products.

A survey conducted by Beatriz H. Carlini in 2014 aimed to assess Washington State clinicians' knowledge, beliefs, clinical practices and training needs as it relates to medical cannabis. Participants were practicing health care professionals in Washington State, which including MDs, PAs, DOs, OAs, NDs, ARNPs, registered nurses (RNs), licensed nurses (LNP), and pharmacists. They utilized a 47-item questionnaire, to indicate opinions and beliefs of medical cannabis. Respondents indicated the extent to which they agreed with the following statements on a 5-point scale from ''strongly disagree'' to ''strongly agree''". Examples of statements are as follows; "Clinicians should be able to prescribe cannabis as medical therapy without fear of legal action, the Food and Drug Administration (FDA) should reclassify cannabis so it is no longer a schedule 1 drug, cannabis can be addictive, using medical cannabis can result in serious physical health risks, even when used as directed, using medical cannabis can result in serious mental health risks, even when used as directed." Four hundred ninety-four respondents submitted the survey and reported being a health care provider in practice in Washington State. Clinical practices were highly correlated with the degree of comfort with issuing a medical cannabis authorization. Sixty-six percent of clinicians who had written authorizations said they felt comfortable/very comfortable doing so, whereas the same was reported by only 6.5% of providers who had never issued an MC authorization. When respondents not comfortable recommending medical cannabis were asked, what would increase their level of comfort, the most frequent responses were, ''education

programs for health care providers,'' ''more clinical data,'' ''more research proving effectiveness,'' ''algorithms for recommending medical cannabis,'' ''endorsed clinical guidelines,'' and ''change in cannabis federal legal status.'' As might be expected, providers who had issued medical cannabis authorizations reported higher knowledge about the endocannabinoid system than other respondents did. (32)

**Conclusion**

In review, there are a limited number of studies of the knowledge pertaining to medicinal marijuana among healthcare providers especially studies in dental hygiene. Based on the slight amount of research obtained from nurses one may consider that healthcare providers can benefit from information regarding medicinal marijuana and that their knowledge does influence on how comfortable they feel treating patients on medicinal marijuana.

# Chapter III

# METHODS AND MATERIALS

## Introduction

This cross sectional descriptive study assessed dental hygienists' knowledge of laws, indications, uses, interactions, and side effects of medical marijuana. It also revealed the relationship between a dental hygienist's knowledge of medical marijuana and their degree of comfort in treating a patient on medical or recreational marijuana.

## Sample Description

The survey was sent to a convenience sample of registered dental hygienists across North America who belong to a closed Facebook group, RDH. This closed group requires admittance from the page administrator who has verified through either everyone's dental hygiene school or license lookup to ensure all members are in fact registered dental hygienists. This was performed with permission from the page administrator.

## Procedures

After approval from the University's Institutional Review Board, Human Research Protection Office (HRPO) an invitation to participate in an online survey through Survey Monkey® was posted on the RDH Facebook page. Included was a brief description along with consent form and a link to access the survey. The survey consisted of 16 multiple-choice questions taking approximately 5-10 minutes to complete and was

available for three weeks. A reminder was sent after week two and the consent form reminded the participant to complete the survey only once.

Extraneous variables consisted of dental hygienists answering the survey more than once, or being untruthful when answering how knowledgeable they are on the medical marijuana. These extraneous variables were addressed by asking hygienists to answer the survey only once and explaining how important honesty is for the survey. Surveys were anonymous and therefore dental hygienists did not feel obligated to know everything asked on the survey. The procedure was simple since majority of people have access to internet and can complete the survey on a computer, tablet or even smart phone.

**Data Collection and Analysis**

The data collected were the survey answers from the online survey. The link was posted on the RDH Facebook page in March and was open for a total of 3 weeks. Like stated before the collection was anonymous so all surveys did not have email addresses associated with their answers attached.

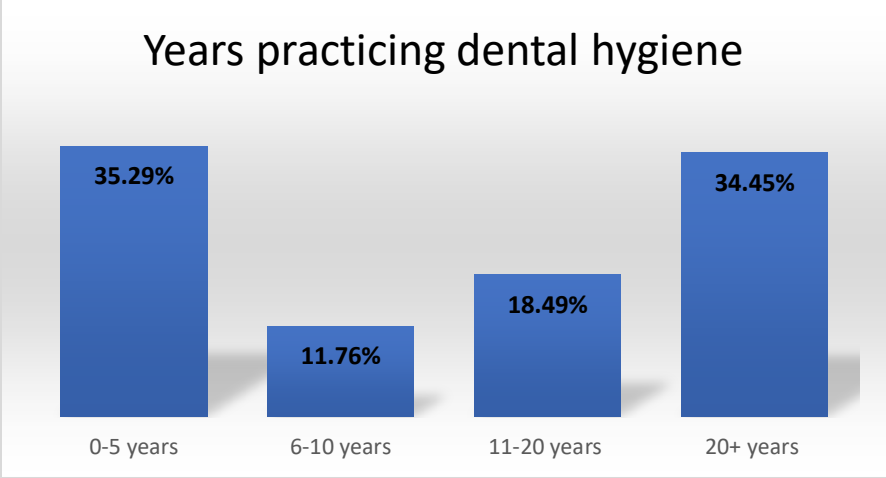
# CHAPTER IV

# RESULTS, DISCUSSION, AND CONCLUSION

## Results

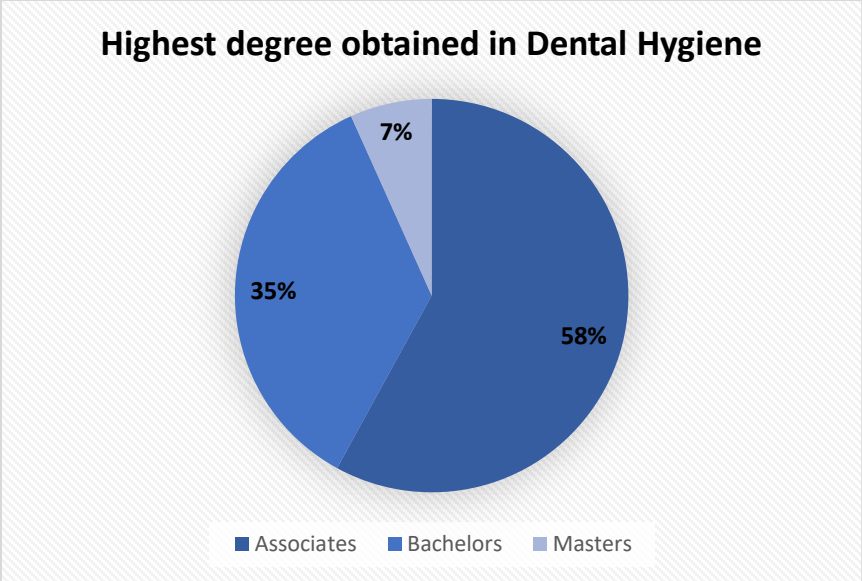
A total of 119 surveys were completed through Survey Monkey®. Respondent characteristics were grouped by years of practice, highest degree obtained, region, and practice setting. Results revealed that 35.29% "42" of dental hygienists have been practicing for 0-5 years, 11.76% "14" for 6-10 years, 18.49% "22" for 11-20 years and 34.45% "41" for 20+ years. (Figure 1)

*Figure 1. Years practicing dental hygiene.*



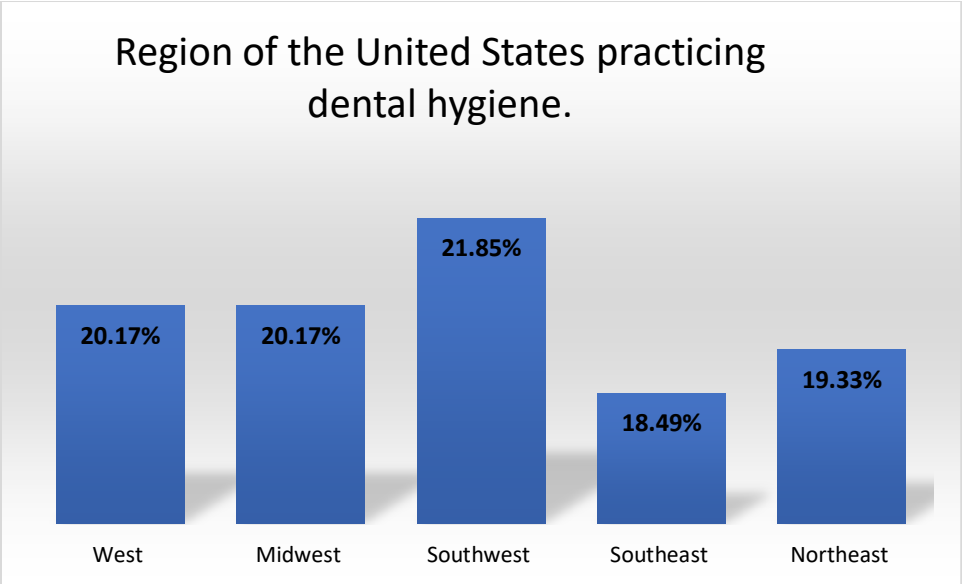

The highest dental hygiene degree obtained by most participants was an Associate's degree at 57% "69". This was followed by 35% "42"receiving a Bachelor's degree and 7% "8" a Master's degree. (Figure 2)

*Figure 2. Highest degree obtained in Dental Hygiene*



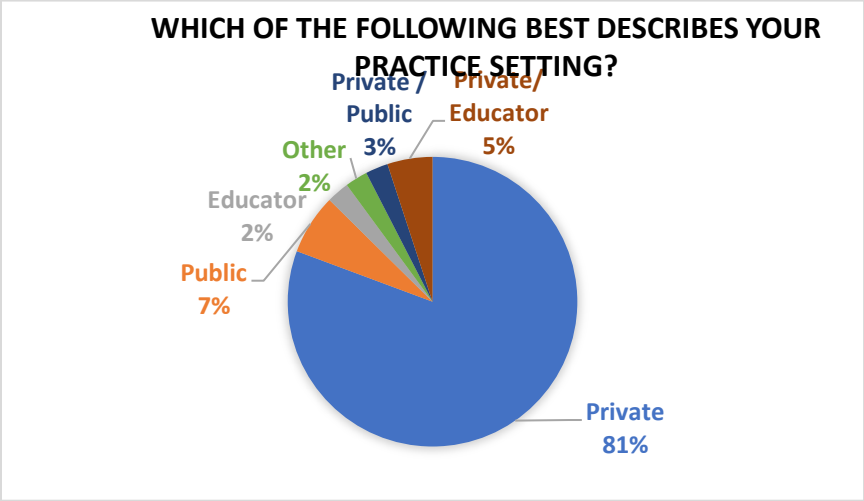

For region, results were distributed evenly except for the Southwest region, which was the highest at 21.85% “26”. The West and Midwest followed, both with 20.17% “24”, then the Northeast with 19.33% “23” and the Southeast with 18.49% “22”. (Figure 3)

*Figure 3. Region of the United States practicing dental hygiene.*



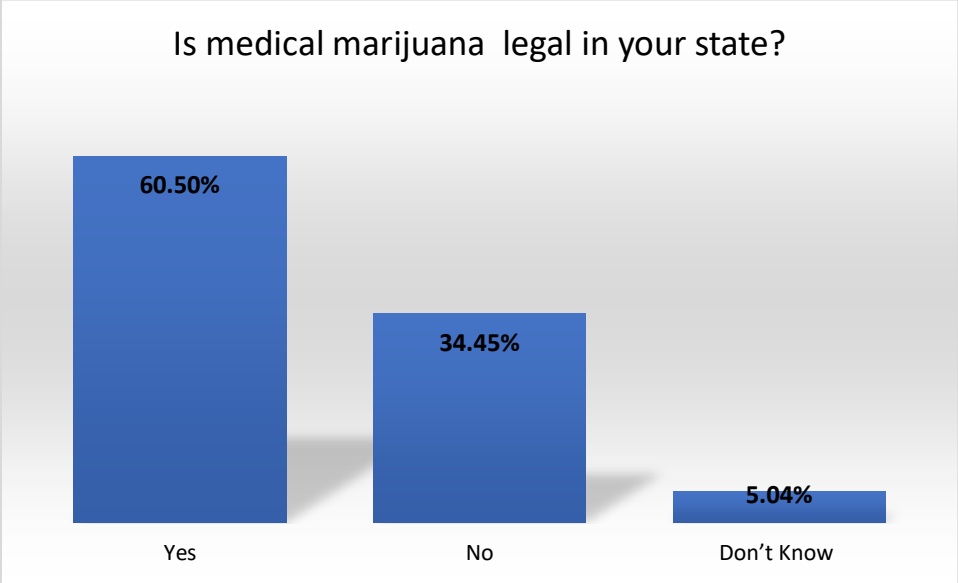
The practice settings of each hygienist were categorized as private, public, educator, school based, hospital and other. Respondents had the option to choose all that applied. The majority, 81% "practiced in a private setting, 7% in public, 2% as educators, 0 in school based and hospital, 2% in other and 3% in private and public and 5% private and educator. (Figure 4)

*Figure 4. Which of the following best describes your practice setting?*



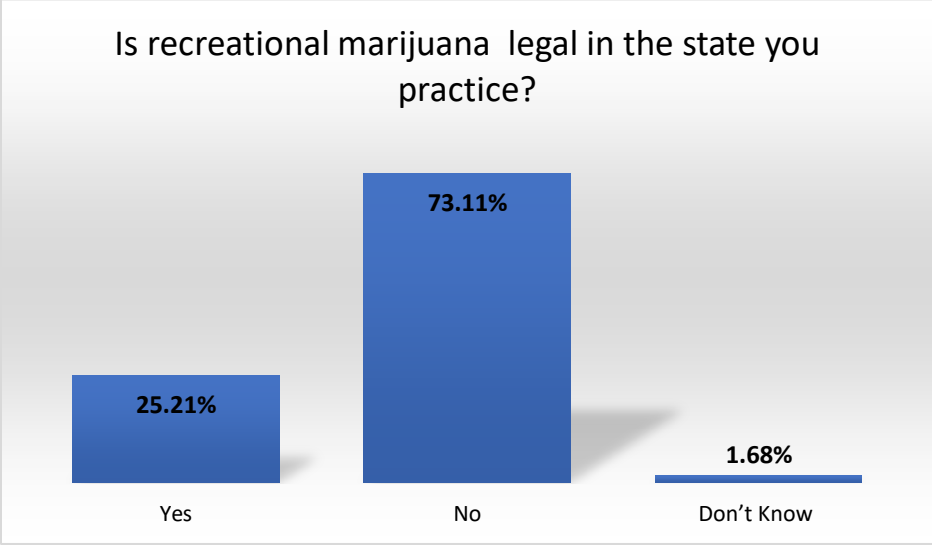

Participants responded to variety of questions regarding the legalization of marijuana, side effects and oral implications. The majority, 60.5% "72" knew medical marijuana was legal in their state and 5% "6" did not know. (Figure 5)

*Figure 5. Is medical marijuana legal in your state?*




For recreational marijuana 25.2% "30" stated it was legal in their state and 1.7% "2" stated they did not know. (Figure 6)

*Figure 6. Is recreational marijuana legal in the state you practice?*



Descriptive results for all other questions are in the following tables. (Table 1 and Table 2)

*Table 1. Survey questions and answers pertaining to knowledge on medical marijuana.*

| Question | Strongly Agree | Somewhat Agree | Neutral / No Opinion | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| I am knowledgeable about the medical conditions in which medical marijuana is both prescribed and indicated. | 23.53% (28) | 47.06% (56) | 11.76% (14) | 10.08% (12) | 7.56% (9) |
| I am knowledgeable about the routes of administration for the use of medical marijuana. | 30.25% (36) | 40.34% (48) | 10.08% (12) | 11.76% (14) | 7.56% (9) |
| I can confidently discuss side effects and adverse reactions of medical marijuana use with my patients. | 15.97% (19) | 36.13% (43) | 15.13% (18) | 15.97% (19) | 16.81% (20) |
| I can confidently discuss oral implications of medical marijuana with my patients. | 17.65% (21) | 39.5% (47) | 10.92% (13) | 20.17% (24) | 11.76% (14) |

*Table 2. Survey questions and answers pertaining to comfort when treating patients on medical and recreational marijuana.*

| Question | Very comfortable | Comfortable | Neutral | Uncomfortable | Very uncomfortable | Would not treat |
|---|---|---|---|---|---|---|
| Rate your degree of comfort when treating a patient on medical marijuana during a routine prophylaxis. | 41.18% (49) | 28.57% (34) | 18.49% (22) | 9.24% (11) | 2.52% (3) | N/A |
| Rate your degree of comfort when treating a patient on recreational marijuana during a routine prophylaxis. | 34.45% (41) | 26.89% (32) | 18.49% (22) | 15.97% (19) | 4.2% (5) | N/A |
| How comfortable are you treating a patient on medical marijuana when administering local anesthesia? | 15.13% (18) | 26.89% (32) | 21.85% (26) | 21.01% (25) | 4.2% (5) | 10.92% (13) |
| How comfortable are you treating a patient on recreational marijuana when administering local anesthesia? | 15.97% (19) | 17.65% (21) | 27.73% (33) | 21.01% (25) | 5.04% (6) | 12.61% (15) |

To determine how knowledgeable hygienists were on the topic of medical marijuana, dental hygienists were asked to rate their response on the following statements: I am knowledgeable on the medical conditions in which medical marijuana is being taken and routes of administration of medical marijuana, I can confidently discuss side effects and oral implications with my patient. Table 1 demonstrates a higher percentage of those who strongly agreed being knowledgeable, 23.5% “28” and 30.3% “36”, however exhibits a drop in percentage in confidence when discussing, 15.9% “19” and 17.65% “21”. When looking at the strongly disagreed column, the percentages increase. When discussing knowledgeable we have 7.56% “9” and 7.56% “9” and when discussing confidently it jumps to 16.81% “20” and 11.76% “14”. This shows that there could be a difference between how knowledgeable the hygienists are vs. how confident they can discuss things with their patient.

To determine the degree of comfort when treating patients on marijuana hygienists were asked to rate the following statements: 1) Rate your degree of comfort when treating a patient on medical marijuana and recreational marijuana during a routine prophylaxis and 2) Rate your degree of comfort when treating a patient on medical marijuana and recreational marijuana when administering local anesthesia. When treating patients on medical marijuana 41.8% “49” hygienists reported they were very comfortable and 2.5% “3” were very uncomfortable. When treating a patient on recreational marijuana 34.5% “41” hygienists said very comfortable and 4.2% “5” very uncomfortable (Table 2). When looking at how comfortable participants felt treating a patient on medical marijuana when administering local anesthesia only 15.1% “18” said

very comfortable, 4.2% “5” very uncomfortable and 10.9% “13” said would not treat. With recreational marijuana and administering local anesthesia 15.9% “19” said very comfortable, 5% “6” very uncomfortable and 12.6 % “15” said would not treat. (Table 2)

Hygienists were asked how regularly they see or treat patients under the influence of marijuana. The options where given by month. The most common was 1-5 patients a month with 53.8% “64” and 11-15 patients a month to be the least common with 0.84% “1”.

Chi-square tables were created to obtain associations between the following questions: 1) I can confidently discuss side effects and adverse reactions of medical marijuana use with my patients, 2) I can confidently discuss oral implications of medical marijuana with my patients, 3) Rate your degree of comfort when treating a patient on medical marijuana during a routine prophylaxis, 4) Rate your degree of comfort when treating a patient on recreational marijuana during a routine prophylaxis, 5) How comfortable are you treating a patient on medical marijuana when administering local anesthesia and 6) How comfortable are you treating a patient on recreational marijuana when administering local anesthesia?

Chi Square tests where done to see if there was an association between how knowledgeable hygienists are on medical marijuana and their degree of comfort when treating a patient on marijuana. With the results obtained, the Chi Square table had 0’s and small sample size. This is small relative to the dimension of the table, so caution should be taken with the p-values and all conclusions obtained. Since many tests were done, the alpha level that will determine when to reject the null hypothesis had to be adjusted. Since there were 8 tests we divided our standard alpha value of 0.05 by 8 giving

us 0.00625. This Bonferroni adjustment protects us from rejecting a true null during the chi square tests, and thus helping prevent a type I error, also known as a "false positive". The following p-values in Table 3 have (*) corresponding to the value of each. One star (*) less than 0.00625, two stars (**) less than 0.001 and three stars (***) next any less than .00078125.

With the questions mentioned there was a total of eight different combinations made to determine if any relationship exists using these questions. Only two of the combinations did not show any relationship with the p-values being 0.135 and 0.093.

*Table 3. Relationship, df, p-value*

| **Relationship** | **df** | **p-value** |
|---|---|---|
| I can confidently discuss side effects and adverse reactions of medical marijuana use with my patients & Rate **your degree of comfort when treating a patient on medical marijuana during a routine prophylaxis.** | 16 | 0.000*** |
| I can confidently discuss side effects and adverse reactions of medical marijuana use with my patients & Rate **your degree of comfort when treating a patient on recreational marijuana during a routine prophylaxis.** | 16 | 0.000*** |
| I can confidently discuss side effects and adverse reactions of medical marijuana use with my patients & **How comfortable are you treating a patient on medical marijuana when administering local anesthesia?** | 20 | 0.0009** |

| | | |
|---|---|---|
| I can confidently discuss side effects and adverse reactions of medical marijuana use with my patients & How **comfortable are you treating a patient on recreational marijuana when administering local anesthesia?** | 20 | 0.1348 |
| I can confidently discuss oral implications of medical marijuana with my patients & **Rate your degree of comfort when treating a patient on medical marijuana during a routine prophylaxis.** | 16 | 0.00*** |
| I can confidently discuss oral implications of medical marijuana with my patients & **Rate your degree of comfort when treating a patient on recreational marijuana during a routine prophylaxis.** | 16 | 0.00*** |
| I can confidently discuss oral implications of medical marijuana with my patients & **How comfortable are you treating a patient on medical marijuana when administering local anesthesia?** | 20 | 0.0001*** |
| I can confidently discuss oral implications of medical marijuana with my patients & **How comfortable are you treating a patient on recreational marijuana when administering local anesthesia?** | 20 | 0.0931 |

The null hypotheses are rejected only if we are less than 0.05/8 = 0.00625, because 6 of the 8 where less than the .00625 we will reject the null hypothesis that there is no relationship between the two questions and conclude there is a relationship between the two.

## Discussion

The study found an association between the knowledge of medical marijuana and comfortability on seeing a patient on marijuana. The association was found by comparing the following statements: When comparing "I can confidently discuss side effects and adverse reactions of medical marijuana and degree of comfort when treating a patient on medical marijuana during a routine prophylaxis", results revealed that most hygienists that strongly agreed and somewhat agreed are the ones that felt the most comfortable seeing a patient on marijuana. Those that strongly disagreed and somewhat disagree where the ones that felt the most uncomfortable. The same occurred when the knowledge questions where compared to recreational marijuana. When comparing "I can confidently discuss side effects and adverse reactions of medical marijuana" and changing it to "rate the degree of comfort to recreational marijuana" the majority of hygienists that strongly agreed and somewhat agreed are the ones that felt the most comfortable. Those that strongly disagreed and somewhat disagree where the ones that felt the most uncomfortable. Even though the discussion focuses on recreational marijuana and not medical marijuana there does not seem to be a difference in how comfortable hygienists are when treating patients on either medical or recreational marijuana. Comparing "I can confidently discuss oral implications with my patients" and "rate your degree of comfort when treating a patient on medical marijuana during a routine prophylaxis" had similar results to those of adverse reactions. Most hygienists that strongly agreed and somewhat agreed are the ones that felt the most comfortable and those that strongly disagreed and somewhat disagree where the ones that felt the most uncomfortable. When comparing oral implications and the degree of comfort to

recreational marijuana the majority of hygienists that strongly agreed and somewhat agreed are the ones that felt the most comfortable and those that strongly disagreed and somewhat disagree where the ones that felt most uncomfortable. Again, results do not show significance whether it is recreational marijuana or medical marijuana during a routine prophylaxis.

The study found an association on knowledge of medical marijuana and comfortability on treating a patient on marijuana when administering anesthesia. When comparing "I can confidently discuss side effects and adverse reactions of medical marijuana" to "how comfortable are you treating a patient on medical marijuana when administering local anesthesia" there was a stronger association between the two. Twenty hygienists stated that they strongly disagree they felt confident discussing adverse reactions to patients while 13 hygienists answered they would not treat the patient. Twenty-five answered they were uncomfortable and 5 very uncomfortable. When comparing "I can confidently discuss oral implications" to "how comfortable are you treating a patient on medical marijuana when administering local anesthesia" a total of 14 hygienists stated that they strongly disagree they felt confident discussing oral implications to patients, 13 hygienists state that they would not treat the patient, 25 uncomfortable and 5 very uncomfortable.

Something to note is that for the questions involving anesthesia we have a few more neutral answers. This can be because of different scope of practice in different states. In some states, dental hygienists cannot administer local anesthesia.

We can safely say there is an association between dental hygienist knowledge on medical marijuana and their level of comfort when treating a patient on marijuana. Therefore, dental providers should be educated on the topic. This includes laws, side effects, the reasons of why it is being used, routes of administration and oral implications. Armed with this knowledge dental providers can educate the patient and be able to answer questions the patients might have. In this study, we are seeing that if a hygienist does not know much about marijuana and because of this they are most likely to dismiss a patient or not feel comfortable treating the patient, we need to educate hygienists so this specific population of marijuana users can receive either preventative or restorative treatment.

## Conclusion

In conclusion, we will reject the null hypothesis that there is no relationship between dental hygienists' knowledge and the comfortability of treating a patient on marijuana and conclude there is a relationship between the two. We will also conclude that dental hygienists can use more education on medical marijuana along with training on how to communicate with patients to make sure the correct information is presented to the patient.

# CHAPTER V

## ARTICLE FOR SUBMISSION

**TITLE PAGE:**

# DENTAL HYGIENISTS' KNOWLEDGE OF MEDICAL MARIJUANA: A SURVEY

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**ABSTRACT**

**Purpose:** Dental hygienists will encounter patients who use medicinal marijuana during the provision of routine dental care. As such, dental hygienists must be comfortable with the management of patients who use medicinal marijuana during treatment. The purpose of this study was to explore the association between a dental hygienists' knowledge of medical marijuana and their degree of comfort when treating patients who use marijuana.

**Methods:** A multiple-choice survey was sent to a convenience sample of registered dental hygienists across North America who belong to the closed Facebook group named RDH. Respondents self-reported their knowledge of laws, indications, uses, interaction and side effects of medical marijuana. Respondents also reported on the frequency of treating patients using medicinal marijuana and their degree of comfort.

**Results:** A total of 119 dental hygienists completed the survey. Fifty-four percent of the respondents reported they see patients who use medicinal marijuana as often as 1-5 times per month. A statistically significant association between the knowledge of medical marijuana and degree of comfort while treating a patient was found.

**Conclusion:** Dental hygienists should continue to stay abreast of emerging information regarding medicinal marijuana and the implications associated with oral health treatments. Dental hygienists must be comfortable with the management of all patients.

The prevalence of medicinal marijuana continues to increase; the knowledge of medicinal marijuana is important for providing excellent oral healthcare by Dental hygienists.

## CLINICAL RELEVANCE

## SCIENTIFIC RATIONAL FOR THE STUDY

The use of medical marijuana is widespread and evidence shows its use has a negative impact on oral health. Therefore, dental hygiene providers must be knowledgeable on medical marijuana to have discussions with patients when needed. Scarce research on the topic makes it difficult to determine if a relationship between the knowledge and the comfortability in treating a patient on medical marijuana exists

## PRINCIPLE FINDINGS

There is a relationship between dental hygienists' knowledge and the comfortability of treating a patient on marijuana. We will also conclude that dental hygienists can use more education on medical marijuana along with training on how to communicate with patients to make sure the correct information is presented to the patient.

## PRACTICE IMPLICATIONS

Dental hygienists can use more education on medical marijuana along with training on how to communicate with patients to make sure the correct information is presented to the patient.

## INTRODUCTION

Marijuana is the most commonly used illicit drug, with 19.8 million past-month users. (1) Dental hygienists' will likely encounter patients under the influence of this substance in the dental office. To provide the best quality of care, the dental hygienist must be aware of the oral implications, side effects and necessary modifications to treatment. The level of knowledge and competence of medical providers is adequate, but most indicate they would welcome further training. (2) The more knowledgeable dental hygienists are regarding medical marijuana, the easier it can be to address patient needs.

### Medical Marijuana and Its Use

Cannabis preparations are derived from the hemp plant, Cannabis sativa, which contains 460 known compounds called cannabinoids. Sixty of which are unique to the plant and contain a primary active chemical, d-9-tetrahydrocannabinol (THC) shown to have psychoactive properties, this is the part of the plant that gives the "high". Marijuana, hashish, and hash oil are three types of cannabis. (3) Marijuana is often referred to by a variety of names, including pot, cannabis, weed, hemp, hash.

Today, the most common reason patients seek medical marijuana, is for the management of chronic pain. (1) However, the Food and Drug Administration (FDA) has not approved medical marijuana as a safe and effective drug for any indication, but is aware that there is considerable interest in its use to attempt to treat many medical conditions, for example, glaucoma, AIDS wasting syndrome, neuropathic pain, cancer,

multiple sclerosis, chemotherapy-induced nausea, and certain seizure disorders. (4) The agency has approved two drugs containing a synthetic version of a substance that is present in the marijuana plant and one other drug containing a synthetic substance that acts similarly to compounds found in marijuana but is not present in marijuana. The 2 FDA approved cannabinoids available in the United States are Dronabinol and Nabilone.

According to the State Medical Marijuana Laws, there are 29 states with legal use of medical marijuana. Although the approved conditions of medicinal marijuana vary from state to state there are many Americans using medicinal marijuana as a different approach when it comes to dealing with pain and their conditions. (5) Patients that are using Marijuana for medical purposes are less likely to disclose its use on a medical history form. This may be caused by the way global medical and dental history forms lump substance abuse into one category. A prime example "Are you a substance abuse user", is among the many questions used on a medical history form which could hinder a patient's discloser. (6)

**Side Effects**

Patients who present under the influence of marijuana may show a variety of signs. Reported side effects of marijuana can include the following dizziness, drowsiness, short-term memory loss, and euphoria. Serious side effects include severe anxiety and psychosis. Short term effects of marijuana can include the following. Feeling of well-being, talkativeness, drowsiness, decreased nausea, increased appetite, loss of coordination, bloodshot eyes, dryness of the eyes, mouth, and throat. Since medicinal marijuana has not been legal for many years there is limited research on the long-term

effects of cannabis. On the available evidence, the major probable adverse effects are those to the cardiovascular system and respiratory system.

**Medical Marijuana and Dental Implications**

Generally, cannabis users have poor oral health compared to non-users, with higher DMFT index scores, higher plaque scores and less healthy gingiva. (7) In another similar study, Di Cugno found the number of decayed teeth amongst cannabis users to be 2.5 times higher than that of controls, which made the overall DMFT index in their study statistically significant. (8)

Studies have assessed the relationship between use of recreational cannabis and periodontal disease among adults living in the United States. Data revealed that frequent recreational cannabis users exhibited deeper probing depths, higher attachment loss scores, and higher odds of having severe periodontitis than non-frequent recreational cannabis users. (9). Studies have also reported that cannabis users brush their teeth less frequently. (10)

**Xerostomia**

Saliva is commonly known to protect the underlying mucosa from frictional damage. It is also an excellent buffering system involved in protecting the oral cavity, especially the teeth, from dental diseases such as caries. A study conducted by Darling aimed to determine the oral effects of cannabis and found xerostomia in 69.6% of its participants after smoking cannabis, compared to 18.6% of the cigarette smoking control

group. (11) Another study established that cannabis users generally experienced dry mouth for approximately 1-6 hours after its use. (12)

**Local Anesthesia**

Many individuals commonly reporting as anxiety during dental visits, specifically those receiving local anesthesia. Twenty-five percent of adults express anxiety when receiving dental injections. (13) To compensate for this, fear, an individual may use marijuana to feel relaxed and help with anxiety. The safety of local anesthetics when the patient is under the influence of marijuana may be of concern to providers, but local anesthetics, analgesics and antibiotics commonly used in dentistry do not interact with cannabis. (13) This can be attributed to the fact that marijuana is a central nervous system depressant rather than a stimulant. (14)

There is evidence to show that cannabis has a negative effect on oral health, however, further studies are required with reduced confounding factors to show more accurate findings.

**Provider Knowledge**

Health care providers, have an obligation to be educated and be informed on topics that can affect patients' wellbeing. Studies done on how much knowledge providers on medical marijuana were hard to obtain especially those to pertaining to dentist or dental hygienists. A questionnaire on nurses' knowledge, attitudes, beliefs and practices regarding substance showed that knowledge and skill gaps exist in assessment and management of alcohol and drug problems (2)

A survey conducted to assess Washington State clinicians' knowledge, beliefs, clinical practices and training needs as it relates to medical cannabis. Results indicate that providers' degree of comfort were highly correlated with issuing a medical cannabis authorization. When respondents not comfortable recommending medical cannabis were asked, what would increase their level of comfort, the most frequent responses were "education programs for health care providers.'' (15)

In review, there are a limited number of studies of the knowledge pertaining to medicinal marijuana among healthcare providers especially studies in dental hygiene. It was important to obtain history on the topic and reasons of why medicinal marijuana has become so popular with patients. Based on the slight amount of research obtained from nurses one may consider that healthcare providers can benefit from information regarding medicinal marijuana and that their knowledge does influence on how comfortable they feel treating patients on medicinal marijuana. The purpose of this study is to evaluate dental hygienists' knowledge of laws, indications, uses, interactions, and side effects of medical marijuana. It will also explore the association between the knowledge and the comfortability in treating a patient on medical marijuana.

## STUDY POPULATION AND METHODOLOGY

The survey was sent to a convenience sample of registered dental hygienists across North America who belong to a closed Facebook group RDH. This closed group requires admittance from the page administrator. Upon approval from HRPO an invitation to participate in an online survey through Survey Monkey was posted on the RDH Facebook page with permission of the page administrator. Included was a brief

description of the survey and a link to access the survey. The survey consisted of 16 multiple choice questions and took approximately 5-10 minutes to complete. Once a participant clicked on the link they would be redirected to the survey online platform. The survey will be available a total of 3 weeks. After the lapse of the second week a reminder post was sent as a reminder to complete the survey. The survey was available after the reminder post for one week. With both times the consent form will remind the dental hygienist to only complete the survey once. Extraneous variables can consist of dental hygienists answering the survey more than once, or being untruthful when answering how knowledgeable they are on the medical marijuana. The extraneous variables were addressed by the following. Consent form were asking hygienists to answer the survey once and explaining how important honesty is for the survey. Survey was anonymous and therefore dental hygienists should not feel obligated to know everything asked on the survey. The procedure should be very simple since majority of people have access to internet and can complete the survey on a computer, tablet or even smart phone.

**RESULTS**

A total of 119 surveys were completed through Survey Monkey. Respondent characteristics were grouped by years of practice, highest degree obtained, region, and practice setting. Results revealed that 35.29% of dental hygienists have been practicing for 0-5 years, 11.76% for 6-10 years, 18.49% for 11-20 years and 34.45% for 20+ years. The highest dental hygiene degree obtained by most participants was an Associate's degree at 57%. This was followed by 35% receiving a Bachelor's degree and 7% a

Master's degree. For region, results were distributed evenly except for the Southeast region, which was the highest at 21.85%. The West and Midwest followed, both with 20.17%, then the Northeast with19.33% and the Southeast with18.49%. The practice setting of each hygienist were categorized as private, public, educator, school based, hospital and other. Respondents had the option to choose all that applied. The majority, 81%practiced in a private setting, 7% in public, 2% as educators, 0 in school based and hospital, 2% in other and 3% in private and public and 5% private and educator. Participants responded to variety of questions regarding the legalization of marijuana, side effects and oral implications. The majority, 60.5% knew medical marijuana was legal in their state and 5% did not know. For recreational marijuana 25.2% stated it was legal in their state and 1.7% stated they did not know. To determine how knowledgeable hygienists were on the topic of medical marijuana, dental hygienists were asked to rate their response on the following statements: I am knowledgeable on the medical conditions in which medical marijuana is being taken and routes of administration of medical marijuana, I can confidently discuss side effects and oral implications with my patient.

*Table I. Survey questions and answers pertaining to knowledge on medical marijuana.*

| Question | Strongly Agree | Somewhat Agree | Neutral / No Opinion | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| I am knowledgeable about the medical conditions in which medical marijuana is both prescribed and indicated. | 23.53% (28) | 47.06% (56) | 11.76% (14) | 10.08% (12) | 7.56% (9) |
| I am knowledgeable about the routes of administration for the use of medical marijuana. | 30.25% (36) | 40.34% (48) | 10.08% (12) | 11.76% (14) | 7.56% (9) |
| I can confidently discuss side effects and adverse reactions of medical marijuana use with my patients. | 15.97% (19) | 36.13% (43) | 15.13% (18) | 15.97% (19) | 16.81% (20) |
| I can confidently discuss oral implications of medical marijuana with my patients. | 17.65% (21) | 39.5% (47) | 10.92% (13) | 20.17% (24) | 11.76% (14) |

To determine the comfortability of treating patients on marijuana hygienists were asked to rate the following statements: 1) Rate your degree of comfort when treating a patient on medical marijuana and recreational marijuana during a routine prophylaxis and 2) Rate your degree of comfort when treating a patient on medical marijuana and recreational marijuana when administering local anesthesia.

*Table II. Survey questions and answers pertaining to comfort when treating patients on medical and recreational marijuana.*

| Question | Very comfortable | Comfortable | Neutral | Uncomfortable | Very uncomfortable | Would not treat |
|---|---|---|---|---|---|---|
| Rate your degree of comfort when treating a patient on medical marijuana during a routine prophylaxis. | 41.18% (49) | 28.57% (34) | 18.49% (22) | 9.24% (11) | 2.52% (3) | N/A |
| Rate your degree of comfort when treating a patient on recreational marijuana during a routine prophylaxis. | 34.45% (41) | 26.89% (32) | 18.49% (22) | 15.97% (19) | 4.2% (5) | N/A |
| How comfortable are you treating a patient on medical marijuana when administering local anesthesia? | 15.13% (18) | 26.89% (32) | 21.85% (26) | 21.01% (25) | 4.2% (5) | 10.92% (13) |
| How comfortable are you treating a patient on recreational marijuana when administering local anesthesia? | 15.97% (19) | 17.65% (21) | 27.73% (33) | 21.01% (25) | 5.04% (6) | 12.61% (15) |

Chi-square tables were created to obtain associations between the following questions: 1) I can confidently discuss side effects and adverse reactions of medical marijuana use with my patients, 2) I can confidently discuss oral implications of medical marijuana with my patients, 3) Rate your degree of comfort when treating a patient on medical marijuana during a routine prophylaxis, 4) Rate your degree of comfort when treating a patient on recreational marijuana during a routine prophylaxis, 5) How comfortable are you treating a patient on medical marijuana when administering local anesthesia and 6) How comfortable are you treating a patient on recreational marijuana when administering local anesthesia? With the results obtained, the Chi Square table had 0's and small sample size. This is small relative to the dimension of the table, so caution should be taken with the p-values and all conclusions obtained. Since many tests were done, the alpha level that will determine when to reject the null hypothesis had to be adjusted. Since there were 8 tests we divided our standard alpha value of 0.05 by 8 giving us 0.00625. This Bonferroni adjustment protects us from rejecting a true null during the

chi square tests, and thus helping prevent a type I error, also known as a "false positive". The following p-values in Table 3 have (*) corresponding to the value of each. One star (*) less than 0.00625, two stars (**) less than 0.001 and three stars (***) next any less than .00078125.

With the questions mentioned there was a total of eight different combinations made to determine if any relationship exists using these questions. Only two of the combinations did not show any relationship with the p-values being 0.135 and 0.093.

| **Relationship** | **df** | **p-value** |
|---|---|---|
| I can confidently discuss side effects and adverse reactions of medical marijuana use with my patients & **Rate your degree of comfort when treating a patient on medical marijuana during a routine prophylaxis.** | 16 | 0.000*** |
| I can confidently discuss side effects and adverse reactions of medical marijuana use with my patients & **Rate your degree of comfort when treating a patient on recreational marijuana during a routine prophylaxis.** | 16 | 0.000*** |
| I can confidently discuss side effects and adverse reactions of medical marijuana use with my patients & **How comfortable are you treating a patient on medical marijuana when administering local anesthesia?** | 20 | 0.0009** |
| I can confidently discuss side effects and adverse reactions of medical marijuana use with my patients & **How comfortable are you treating a patient on recreational marijuana when administering local anesthesia?** | 20 | 0.1348 |

| | | |
|---|---|---|
| I can confidently discuss oral implications of medical marijuana with my patients & **Rate your degree of comfort when treating a patient on medical marijuana during a routine prophylaxis.** | 16 | 0.00*** |
| I can confidently discuss oral implications of medical marijuana with my patients & **Rate your degree of comfort when treating a patient on recreational marijuana during a routine prophylaxis.** | 16 | 0.00*** |
| I can confidently discuss oral implications of medical marijuana with my patients & **How comfortable are you treating a patient on medical marijuana when administering local anesthesia?** | 20 | 0.0001*** |
| I can confidently discuss oral implications of medical marijuana with my patients & **How comfortable are you treating a patient on recreational marijuana when administering local anesthesia?** | 20 | 0.0931 |

The null hypotheses are rejected only if we are less than 0.05/8 = 0.00625, because 6 of the 8 where less than the .00625 we will reject the null hypothesis that there is no relationship between the two questions and conclude there is a relationship between the two.

## DISCUSSION

The study found an association between the knowledge of medical marijuana and comfortability on seeing a patient on marijuana. When comparing I can confidently discuss side effects and adverse reactions of medical marijuana and degree of comfort when treating a patient on medical marijuana during a routine prophylaxis, we found that most hygienists that strongly agreed and somewhat agreed are the ones that felt the most

comfortable seeing a patient on marijuana. Those that strongly disagreed and somewhat disagree where the ones that felt the most uncomfortable. The same occurred when the knowledge questions where compared to recreational marijuana. When combining I can confidently discuss side effects and adverse reactions of medical marijuana and changing it to the degree of comfort to recreational marijuana the majority of hygienists that strongly agreed and somewhat agreed are the ones that felt the most comfortable. Those that strongly disagreed and somewhat disagree where the ones that felt the most uncomfortable. Even though we are discussing recreational marijuana and not medical marijuana there doesn't seem to be a difference in how comfortable hygienists are when treating patients on either medical or recreational marijuana. I can confidently discuss oral implications with my patients and rate your degree of comfort when treating a patient on medical marijuana during a routine prophylaxis were very similar to those of adverse reactions. Most hygienists that strongly agreed and somewhat agreed are the ones that felt the most comfortable and those that strongly disagreed and somewhat disagree where the ones that felt the most uncomfortable. When combining oral implications and the degree of comfort to recreational marijuana the majority of hygienists that strongly agreed and somewhat agreed are the ones that felt the most comfortable and those that strongly disagreed and somewhat disagree where the ones that felt most uncomfortable. So, like mentioned before it does not really show significance if it is recreational marijuana or medical marijuana during a routine prophylaxis.

The study found an association on knowledge of medical marijuana and comfortability on treating a patient on marijuana when administering anesthesia. When

comparing I can confidently discuss side effects and adverse reactions of medical marijuana to how comfortable are you treating a patient on medical marijuana when administering local anesthesia there was a stronger association between the two. We had a total of 20 hygienists state they strongly disagree they felt confident discussing adverse reactions to patients and we had a total of 13 hygienists answer they would not treat the patient, 5 very uncomfortable and 25 uncomfortable. When comparing I can confidently discuss oral implications to how comfortable you are treating a patient on medical marijuana when administering local anesthesia. There were a total of 14 hygienists who stated they strongly disagree they felt confident discussing oral implications to patients. A total of 13 hygienists state they would not treat the patient, 5 were very uncomfortable and 25 stated they were uncomfortable.

Something to note is that for the questions involving anesthesia, a few more neutral answers were given. A difference in scope of practice regarding which states allow hygienists to administer local anesthesia, is a possible reason for the higher number of neutral responses.

We can safely say there is an association between dental hygienist knowledge on medical marijuana and their level of comfort when treating a patient on marijuana. Therefore, dental providers should be educated on the topic. This includes laws, side effects, the reasons of why it is being used, routes of administration and oral implications. Armed with this knowledge dental providers can educate the patient and be able to answer questions the patients might have. In this study, we are seeing that if a hygienist

does not know much about marijuana and because of this they are most likely to dismiss a patient or not feel comfortable treating the patient, we need to educate hygienists so this specific population of marijuana users can receive either preventative or restorative treatment.

## CONCLUSION

Dental hygienists should continue to stay abreast of emerging information regarding medicinal marijuana and the implications associated with oral health treatments. Dental hygienists must be comfortable with the management of all patients. The prevalence of medicinal marijuana continues to increase; the knowledge of medicinal marijuana is important for providing excellent oral healthcare by Dental hygienists

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# APPENDICES

**APPENDIX A: HRRC APPROVAL LETTER**

**APPENDIX B: STUDY SURVEY**

**APPENDIX C: RECRUITMENT LETTER**

**APPENDIX D: CONSENT FORM**

**APPENDIX E: REMINDER LETTER**

**APPENDIX A**

**HRRC APPROVAL LETTER**

**APPENDIX B**

**STUDY SURVEY**

1. How many years have you been practicing dental hygiene?

a. 0-5 years
b. 6-10 years
c. 11- 20 years
d. 20+ years

2. What is the highest degree obtained in Dental Hygiene?

a. Associate's Degree
b. Bachelor's Degree
c. Master's Degree

3. In what region of the United States do you practice?

a. Northwest
b. Midwest
c. Southwest
d. Southeast
e. Northeast

4. Which of the following best describes your practice setting? (check all that apply)

a. private
b. public
c. educator
d. school based
e. hospital
f. other

Please choose the best response to the following statements.

5. Is medical marijuana is legal in your state?

a. Yes
b. No
c. Don't Know

6. Is recreational marijuana legal in the state you practice?

a. Yes
b. No
c. Don't Know

7. I am knowledgeable about the medical conditions in which medical marijuana is both prescribed and indicated.

a. Strongly Agree
b. Somewhat Agree
c. Neutral / No Opinion
d. Somewhat Disagree
e. Strongly Disagree

8. I am knowledgeable of the modes of administration for the use of medical marijuana.

a. Strongly Agree
b. Somewhat Agree
c. Neutral / No Opinion
d. Somewhat Disagree
e. Strongly Disagree

9. I am comfortable discussing the active agents in marijuana.

a. Strongly Agree
b. Somewhat Agree
c. Neutral / No Opinion
d. Somewhat Disagree
e. Strongly Disagree

10. I can confidently discuss side effects and adverse reactions of medical marijuana use with my patients.

a. Strongly Agree
b. Somewhat Agree
c. Neutral / No Opinion
d. Somewhat Disagree
e. Strongly Disagree

11. I can confidently discuss oral implications of medical marijuana with my patients.

a. Strongly Agree
b. Somewhat Agree
c. Neutral / No Opinion
d. Somewhat Disagree
e. Strongly Disagree

12. Rate your degree of comfort when treating a patient on medical marijuana during a routine prophylaxis?

a. Very comfortable
b. Comfortable
c. Neutral
d. Uncomfortable
e. Very uncomfortable

13. Rate your degree of comfort when treating a patient on recreational marijuana during a routine prophylaxis?

a. Very comfortable
b. Comfortable
c. Neutral
d. Uncomfortable
e. Very uncomfortable

14. How comfortable are you treating a patient on medical marijuana when administering local anesthesia?

a. Very comfortable
b. Comfortable
c. Neutral
d. Uncomfortable
e. Very uncomfortable
f. Would not treat

15. How comfortable are you treating a patient on recreational marijuana when administering local anesthesia?

a. Very comfortable

b. Comfortable
c. Neutral
d. Uncomfortable
e. Very uncomfortable
f. Would not treat

16. How regularly do you see or treat patients under the influence of marijuana?

a. 0 a month
b. 1-5 a month
c. 6-10 a month
d. 11-15 a month
e. 16+ a month

## APPENDIX C

## RECRUITMENT LETTER

Hello Fellow Hygienists,

You have been selected to participate in a sixteen question research survey, DENTAL HYGIENISTS' KNOWLEDGE OF MEDICAL MARIJUANA: A SURVEY. It aims to evaluate dental hygienists knowledge of medical marijuana. The survey is brief and should take approximately 5-10 minutes to complete.

Click on the following link to participate:

https://www.surveymonkey.com/r/LHRDHUNMMS

If you have any questions or concerns please email Lizbeth Hinojos at Lizzy44@salud.unm.edu, or If you have questions regarding your legal rights as a research subject, you may call the UNMHSC Office of Human Research Protections at (505) 272-1129.

Your participation is greatly appreciated.

Christina Calleros MS, Principal Investigator

Lizbeth Hinojos RDH BS- Master's Candidate

## APPENDIX D

## CONSENT FORM

**University of New Mexico Health Sciences Center**

**Informed Consent Cover Letter for Anonymous Surveys**

**STUDY TITLE**
**DENTAL HYGIENISTS' KNOWLEDGE OF MEDICAL MARIJUANA: A SURVEY**

Mrs. Christina Calleros from the Department of Dental Hygiene, is conducting a research study. The purpose of the study is to find if a relationship exists between a dental hygienist's knowledge of medical marijuana and their degree of comfort when treating a patient. You are being asked to participate in this study because you are a practicing dental hygienist in the United States.

Your participation will involve completing a multiple choice survey. The survey should take about 5-10 minutes to complete. Your involvement in the study is voluntary, and you may choose not to participate. There are no names or identifying information associated with this survey. The survey includes questions such as, "I am comfortable discussing the active agents in marijuana." You can refuse to answer any of the questions at any time. There are no known risks in this study, but some individuals may experience discomfort when answering questions. All data will be kept for 1 year in a locked file in Mrs. Christina Calleros office and then destroyed.

The findings from this project will provide information on the knowledge of dental hygienist regarding medical marijuana and whether a relationship exists between a dental hygienist's knowledge of medical marijuana and their degree of comfort in treating a patient. If published, results will be presented in summary form only.

If you have any questions about this research project, please feel free to call Lizbeth Hinojos at (505) 803-4429. If you have questions regarding your legal rights as a research subject, you may call the UNMHSC Office of Human Research Protections at (505) 272-1129.

By clicking OK, you will be agreeing to participate in the above described research study.

Thank you for your consideration.

Sincerely,

Christina Calleros, RDH. MS

Assistant Professor

HRRC#18-150

Version

Date March 5, 2108

## APPENDIX E

## REMINDER LETTER

Hello Fellow Hygienists,

Just a reminder to participate in the sixteen question research survey, DENTAL HYGIENISTS' KNOWLEDGE OF MEDICAL MARIJUANA: A SURVEY. It aims to evaluate dental hygienists knowledge of medical marijuana. The survey is brief and should take approximately 5-10 minutes to complete.

Click on the following link to participate:

https://www.surveymonkey.com/r/LHRDHUNMMS

If you have any questions or concerns please email Lizbeth Hinojos at Lizzy44@salud.unm.edu, or If you have questions regarding your legal rights as a research subject, you may call the UNMHSC Office of Human Research Protections at (505) 272-1129.

Your participation is greatly appreciated.

Christina Calleros MS, Principal Investigator

Lizbeth Hinojos RDH BS- Master's Candidate