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Tobacco Cessation Counseling Practices amongst Dental Hygienists in Central Texas

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ABSTRACT

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Although tobacco cessation is an uphill battle for almost everyone who attempts to quit, it is important that dental hygienists do not assume that patients are not interested. Dental hygienists are in an ideal position to offer cessation help to their tobacco using patients. The purpose of this study was to gain a better understanding of the tobacco cessation practices among central Texas dental hygienists. Specifically, dental hygienists were asked about beliefs, motivation, and confidence with regard to their tobacco cessation practice. A positive significant, moderate, relationship was found between beliefs and confidence (*r=0.647*), beliefs and practices (*r=0.704*), knowledge and capability (*r=0.579*), motivation and capability (*r=0.529*), motivation and practice (*r=0.605*), and years of practice and capability (*r=0.699*). The mean confidence scores for hygienists with more than 20 years of experience differed from those with 1-5 years of experience (p=.003) and 6-10 years of experience (p=.025).

DEDICATION

I will like to dedicate my thesis to my loving family and supporting friends. I love you for being my guiding light and giving me your unconditional love while staying in my corner without any complaints. And most especially to our Almighty God, my research is dedicated to HIM.

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Chapter 1. Introduction

Dental hygienists are licensed oral health professionals who focus primarily on preventing both oral diseases and protecting patients' total health (American Dental Hygienists' Association, 2016). Texas licensed dental hygienists may receive verbal or written authorization to perform any function that has been duly licensed under the direct supervision of a dentist (State Board of Dental Examiners, 2017). According to DeLong and Burkhart (2013) in collaboration with the dentist, the dental hygienist may be the person who assists the patient in obtaining the necessary care. Also, Texas Health and Human Services (2018) advised that oral health education may be provided and documented by a licensed dentist, dental hygienist, dental assistant, and dental case manager; providers must demonstrate oral health education once a year, which includes, but is not limited to the following: oral hygiene instruction (OHI), smoking/tobacco cessation counseling, and nutrition. Since 2001, the American Dental Hygienists' Association (ADHA) has revised their research agenda putting "…assess the effectiveness of dental hygienists in counseling patients regarding prevention and cessation of tobacco use" as one of the top three priorities (Gadbury-Amyot et al., 2002, p.162). The role of the dental hygienist is also underscored by the Surgeon General 's report, *Oral Health in America* and *Healthy People 2020* which brought us the challenge "…increase the proportion of adults who receive preventive intervention in dental offices" (DeLong & Burkhart, 2013, p. 4).

Ideally, dental hygienists are in an optimum position to deliver brief tobacco cessation counseling. During cleaning visits, the dental hygienist usually has more time to spend with their patients than does the dentist. Dental hygienists typically exhibit eagerness and enthusiasm in helping their patients learn new skills and providing oral hygiene instruction (OHI) gives sufficient time for information on how nicotine addiction impacts oral health. Brothwell and

Armstrong (2004) stated: "oral health professional has legitimate professional reasons to help patients to stop smoking" (p. 94). Hygienists must advise patients about the harmfulness of tobacco usage. Information that could assist the hygienist in this role were several ongoing campaigns, new policies, and the Tobacco Control Act, all designed to raise awareness to protect the public from the harmful effects of product use. These include the MPOWER six policies, the Family Smoking Prevention and Tobacco Control Act, and Campaign for Tobacco-Free Kids 2008 (Petersen, 2003). The World Health Organization (WHO) (2005) concluded, "…effects of tobacco show evidence that almost every organ in the body is affected by tobacco consumption also… includes cataracts, pneumonia, acute myeloid leukemia, abdominal aortic aneurysm, stomach cancer, pancreatic cancer, cervical cancer, kidney cancer, and periodontitis" (p.13).

The effects of tobacco have currently not slowed down by far, but "approximately 20% of the U.S. population uses tobacco" (CDC, 2012; Coan et al., 2015, p.190). Curry et al. (2009) presented national data indicating that almost 90% of adult smokers begin while in their adolescent years. Consequently, the "Campaign for Tobacco-Free Kids 2008" was developed because the promoters understood the patterns and prevalence of youth smoking and that quitting behaviors are critical. The Campaign for Tobacco-Free Kids (2018), cited Substance Abuse and Mental Health Services Administration (SAMHSA) (2017) "each day, about 2,300 kids in the United States tried their first cigarette, and another 350 additional kids under the age of 18 become new regular, daily smokers" (para. 1). In the Texas region, demographics showed 12.8 to 16.4 percent of adults are current smokers (CDC, 2016).

Nicotine addiction has continued to be a substantial risk factor in the development and progression of oral cancer, periodontitis, implant failure, and poor wound healing (Davis et al., 2010). Many dental hygienists are continuously faced with the reality of patients' poor tissue

healing after scaling and root planing (S/RP) is done, because of tobacco usage (Al Hulami et al., 2011; Grossi et al., 1996; Johnson & Hill, 2004;). Even when the need for tobacco cessation is evident, not all dental hygienists are willing or able to offer it; studies have shown some of the reasons are that the dental hygienists are still overcoming barriers such as a perceived lack of time, knowledge, training, anticipated patient resistance, and reimbursement issues (Hanioka et al., 2013; Monson, 2004; Petersen, 2005;). Research has shown that both dental hygiene students and Registered Dental Hygienists have a lack of confidence in training as a significant reason for not providing tobacco interventions (Coan et al., 2015). "However, as a primary health care provider, dental professionals are often able to establish and maintain a trusting patient relationship which helps create a safe environment for discussing the topic on tobacco use" (Coan et al., 2015, p. 190).

Statement of the Problem

Nicotine addiction has immediate and long-term effects. As oral health care providers whose specialty is prevention, dental hygienists are encouraged to spread awareness and reinforce tobacco cessation. However, not all dental hygienists are offering tobacco awareness and cessation as part of their professional services for their patients; barriers such as absent or ineffective training in tobacco cessation are often to blame. More should be done to determine what a hygienist needs in order to be more effective in the role of tobacco cessation assistance.

Purpose of the Study

The purpose of this study is to gain a better understanding of the tobacco cessation practices among central Texas dental hygienists. Specifically, I want to know if the independent variables including belief, capability, motivation, and confidence are related to the dependent

variable of tobacco cessation practices. According to Cottrell and McKenzie (2011), "independent variable is the variable that is being examined or tested; and the dependent variable is the measured or observed" (p.84).

Research Questions

This study is guided by the following questions.

1. Is there a relationship between barriers to care (knowledge) and capability of providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?
2. Is there a relationship between beliefs and confidence in providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?
3. Is there a relationship between beliefs and practices in providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?
4. Is there a relationship between capability and motivation in providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?
5. Is there a relationship between motivation and practices in providing tobacco cession counseling? If a relationship exists, what are the characteristics of the relationship?
6. Is there a relationship between years in practices and capability of providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?
7. Is there a relationship between years in practices and confidence of providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?

Limitations of Study

By virtue of utilizing self-reported data, this study's conclusion is limited to what the hygienists report with regard to their beliefs, motivation, confidence, and practices which may not be totally honest or inclusive. The study was not intended to increase skills, improve motivation, or to measure any behavior change in practice. This study does not take into consideration all the roles and responsibilities of a dental hygienist. Thus, it does not put tobacco cessation in the context of a typical appointment. The study was limited to dental hygienists practicing in general dentistry and periodontists' offices.

Assumptions

Participation was voluntary and anonymous; therefore, it was assumed that participants answered the survey questions in an open and honest manner.

Delimitations

The study was delimited to currently registered dental hygienists listed by the Texas State Board of Dental Examiners (TSBDE) with valid mailing addresses on file. Dental hygienists working in pediatric dental offices, and those unemployed were excluded from the study. Dental hygienists working in general dentistry, for a periodontist, or government dental facilities were included.

Definition of Terms

5 A's model (*Ask, Advise, Assess, Assist, and Arrange*) – is a "brief tobacco intervention for patients ready to quit:

- Ask-Identify a document tobacco use status for every patient at every visit.
- Advise-In a clear, strong and personalized manner; urge every tobacco user to quit.
- Assess-is the tobacco user willing to make a quit attempt at this time.
- Assist-For the patient willing to make a quit attempt, use counseling and pharmacotherapy to help him or her quit
- Arrange-Schedule follow-up contact, in person or by telephone preferably with the first week after the quit date" (Agency for Healthcare Research and Quality, 2018, para 2).

Five R's model (Relevance, Risks, Rewards, Roadblocks, and Repetition) -is "the content areas that should be addressed in a motivational counseling intervention to help those who are not ready to quit:

- Relevance-Encourage the patient to indicate how to quitting is personally relevant to him or her.
- Risks- Encourage the patient to identify potential negative consequences of tobacco use that are relevant to him or her.
- Rewards-Ask the patient to identify potential relevant benefits of stopping tobacco use.
- Roadblocks- Ask the patient to identify barriers or impediments to quitting and provide treatment (problem-solving counselling, medication) that could address barriers.
- Repetition- Repeat assessment of readiness to quit. If still not ready to quit repeat intervention at a later date" (World Health Organization, 2014, p.13).

American Dental Hygienists' Association (*ADHA*) – "founded in 1923, the American Dental Hygienists' Association (ADHA) is the largest national organization representing the professional interests of the more than 185,000 registered dental hygienists (RDHs) across the country" (ADHA, 2017, para 1).

Family Smoking Prevention and Tobacco Control Act- "signed into law on June 22, 2009, gives FDA authority to regulate the manufacture, distribution, and marketing of tobacco. Also, puts in place specific restrictions on marketing tobacco products to children and gives FDA authority to take further action in the future to protect public health. These provisions ban: sales to minors, vending machine sales, the sale of packages of fewer than 20 cigarettes, tobacco-brand sponsorships of sports and entertainment events or other social or cultural events, free giveaways

of sample cigarettes and brand-name non-tobacco promotional items” **(**Food and Drug Administration [FDA], 2018, para. 2).

MPOWER six policies- “World Health Organization (WHO) introduced this measure which corresponds to one or more articles of the Framework Convention, to assist in reducing the demand for tobacco products at country-level. The six evidence-based components of MPOWER are:

- **M**onitor tobacco use and prevention policies
- **P**rotect people from tobacco smoke
- **O**ffer help to quit tobacco use
- **W**arn about the dangers of tobacco
- **E**nforce bans on tobacco advertising, promotion and sponsorship
- **R**aise taxes on tobacco
- **R**educe the size of cigarette” (World Health Organization [WHO], 2018, p. 4-7).

Scaling and Root Planing (*S/RP*) – “is the process by which dentists or hygienists remove calculus (tartar) and plaque that attach to the tooth surfaces” (American Dental Association [ADA], 2018, para 4).

Tobacco Cessation Counseling- “is when you talk with a health care provider or a counselor about your tobacco use and work on ways to get tobacco out of your life. This type of counseling helps you break your tobacco habit” (U.S. Department of Veterans Affairs, 2017, para 4).

Chapter 2. Literature Review

By the nature of dental hygienists' training and roles with their dental team, they can assist their patients to quit their tobacco use by providing information, support, and encouragement. According to Parker (2003) dental offices are uniquely situated to provide tobacco cessation counseling as part of their practices. The dental hygienists' position puts them in the frontline to ask their patients two key important questions: Do you smoke? and Do you want to quit? Also, the dental hygienist is "aware tobacco use increases the prevalence and severity of periodontal disease" (Parker, 2003, p.106). Dental hygienists are taught while in their dental hygiene program that patient-centered approach is useful for intervention. Anczak and Nogler (2003) found that brief, repetitive, directed interventions tailored to the needs of the patient, and behavioral stage can increase attempts of quitting tobacco use with patients. It is critical for the dental hygienist to understand the Five A's and Five R's model to individualized behavioral intervention amongst their patients during tobacco cessation.

To support Chapter 2 literature review an extensive search was conducted though the East Tennessee State University Sherrod Library. The source publications are from 1985 to 2018. The databases that were accessed include PubMed, CINAHL, and Cochrane Database of Systematic Reviews. In addition, keywords used to search the database for this review included dental hygiene, tobacco cessation, Five A's model, Five R's model, MPOWER six policies, nicotine addiction, and barriers to tobacco cessation.

Health Consequences of Nicotine Usage

There are many health consequences of nicotine use. Since 1964 when the Surgeon General first announced smoking tobacco was a danger, nicotine usage research has become widespread. Over the years, it has included health effects of active and passive smoking, nicotine addiction, and the impact of tobacco control polices (US DHHS, 2014). Tobacco usage is the

chief preventable cause of mortality in our society and "accounts for more than 480,000 deaths annually" (CDC, 2017, para 1). All forms of tobacco contain nicotine which is a highly addictive substance. The hallmarks of nicotine addiction include: compulsive use, pleasant effects, difficulty in quitting or controlling, recurrent drug cravings, tolerance, physical dependence, and often relapse following absences (Walsh & Ellison, 2005).

Anczak and Nogler (2003) reported "due to nicotine being fast-acting, arriving in the brain within 7 seconds of inhalation; consequently, nicotine stimulates the adrenal glands resulting in the discharge of epinephrine, resulting in the kick or fix experienced by the smoker" (p. 206). Increased epinephrine results in a sudden release of glucose, an increase in blood pressure, increased respiration, and heart rate (Anczak & Nogler, 2003). Also, the CDC (2017) strongly advocated that "cigarette smoking harms nearly every organ of the body, causing many diseases, and reduces the health of smokers in general" (para. 1). CDC (2005) reported "…during 1997--2001, on average, smoking accounted for an estimated 3.3 million years of potential life lost (YPLL) for men and 2.2 million (YPLL) for women annually, excluding burn deaths and those who die from secondhand smoke" (para. 4). Tobacco usage is the number one cause of preventable disease and premature death in the United States (CDC, 2017). Based on the past data, up to half of the lifetime smokers will ultimately die from the result of smoking and during productive middle age (Jha et al., 1999). Diseases related to tobacco use include: cancers, heart attacks, strokes, chronic obstructive pulmonary disease (COPD) and many others (International Agency for Research on Cancer, 2004; WHO, 2013; Leondiadis, 2014, p. 140). In 2004 the International Agency for Research concluded, "that there was sufficient evidence that the habit [smoking] could cause not only lung cancer, but also cancers of the upper aerodigestive tract, pancreas, and lower urinary tract" (IARC, 2004, p. 33). Researchers found that "other

cancers (of the stomach, liver and cervix, renal-cell carcinoma and myeloid leukemia), which have provided sufficient evidence that they can be affected by smoking, i.e., increase their age-specific incidence rates" (IARC, 2004, p. 33).

In addition, to health issues with nicotine, for pregnant women research studies has shown that "smoking increases the risk for congenital anomalies, preterm complications;" for example, "preterm birth, fetal growth restriction, placental abruption, miscarriage, stillbirth, neonatal, and pediatric complications such as sudden infant death syndrome and impaired lung function in childhood" (World Health Organization, 2013; Siu, 2015, p. 623).

Lastly, nicotine usage has been linked with an increased risk for oral disease (Gelskey, 1999; Mecklenburg, 1998; Salvi et al., 1997). Smokeless tobacco use has been reported to cause tooth decay, (Tomar & Winn, 1999) and discoloration of dental restorations (Carr & Ebbert, 2012; Walsh, 2000). Studies have unquestionably recognized the oral cancer link associated with tobacco. Carr and Ebbert (2012) report other researchers in agreement that "tobacco is the major inducer of oral squamous cell carcinoma (SCC) and is considered to be responsible for 50% to 90% of oral cancer cases worldwide" (p. 2). "Globally, lip, oral, oral cavity, and pharyngeal cancers have been estimated to be responsible for 529,500 incident cases and 292,300 deaths in 2012, accounting for about 3.8% of all cancer cases and 3.6% of cancer deaths" (Shield et al., 2017, p. 51). "Approximately 75% of the lip, oral cavity, and pharyngeal cancers are attributed to tobacco smoking" (Shield et al., 2017, p. 51).

Tobacco Forms and Chemical Components

Soneji et al. (2016) described the different forms of tobacco as "combustible tobacco products are cigarettes, cigars (little filtered, cigarillos, premium) and hookah; non-combustible tobacco products are chew, dip, dissolvable, e-cigarettes, snuff, and snus" (p. 174). Caraway and

Chen (2013) did a study to identify the health risks associated with different tobacco product categories (e.g., combustible and noncombustible), and how it was essential to understand the exposure of the snus. Foulds et al. (2003) defined "snus - a moist, ground typically installed oral tobacco product is behind the upper lip, either as loose ground tobacco or contained in sachets appearing like small tea bags, it's the name given in the form of smokeless snuff tobacco commonly used in Sweden," and has been linked to the United States for years (p. 349). Caraway and Chen (2013) concluded "approximately 60%-90% of the amount of nicotine, nitro-s amines (TSNA), and benzo[a] pyrene (B[a] P) intimately present in the snus pouch remained in the pouch after use by snus consumer" (p.670). Rodgman and Perfetti (2009) reported "more than 8,400 different chemical components have been identified in tobacco" (p. 278). Leondiadis (2014) cited Rodmgman and Perfetti (2009) regarding classes of compounds contained in tobacco "neutral gases, carbon, and nitrogen oxides, amides, imides, lactams, carboxylic acids, lactones, esters, aldehydes, ketones, alcohols, phenols, amines, N-nitrosamines, N-heterocyclics, aliphatic hydrocarbons, monocyclic, polycyclic aromatic hydrocarbons (PAHs), nitriles, anhydrides, carbohydrates, ethers, nitro compounds, and metals" (p. 141). "There is sufficient evidence that smokeless tobacco products cause addiction; precancerous oral lesions; cancer of the oral cavity, esophagus, and pancreas; and adverse reproductive and developmental effects including stillbirth, preterm birth, and low birth weight" (Hatsukami et al., 2014, p. xv).

Advantages of Tobacco Cessation Counseling

There is "good evidence that quitting smoking at any age results in significant health gains" (Abdullah & Husten, 2006, p. 461). As Lightwood et al. (1999), Lightwood and Glantz (1997), and Shields (2002) concluded, the only known way to reduce cancer risk in smokers is to complete cessation, which results in a 35% lower risk death due to tobacco-related illness and a

64% reduced risk of tobacco-related cancer (Anczak & Nogler, 2003). Smoking cessation counseling is the most important, cost-effective preventive maintenance that clinicians can offer patients who smoke (Anczak & Nogler, 2003). In a dental practice, the setting can provide a unique opportunity to assist tobacco users in achieving tobacco abstinence (Carr & Ebbert, 2012; Christen et al., 1990; Needleman et al., 2010; & Ramseier et al., 2010;).

Tobacco Cessation Intervention Strategies

There are several steps to consider when involved the tobacco cessation intervention strategies Glynn et al. (1990) study found the following:

> Two decades of research suggests that self-help and minimal intervention strategies for smoking cessation may be the preferred means by which smokers could stop and can produce success rates approximating those of more formal programs, at lower cost, and with greater access to relevant populations. (p. 329).

Likewise, Prochaska et al. (1993) suggested that "[m]ore effective smoking cessation programs are likely to emerge from trying new approaches rather than from variations on themes that have been tested for decades" (p. 399). Two researchers named James Prochaska and Carlo DiClemente in 1984 developed a transtheoretical framework or model for understanding and examining the process of change necessary for smoking cessation as well as other problematic behaviors (DiClemente et al., 1991). Some years later the transtheoretical model has become widely known as the Stages of Change Theory. The six stages of change are precontemplation, contemplation, preparation, action, maintenance, and termination (Procheaska & Velicer, 1998). Monson and Engewick (2005) mirrored Procheaska and Velicer (1998) explaining how to integrate processes and principles of change from the transtheoretical model. According to Monson and Engewick, (2005) these are the definitions of the transtheoretical principles:

1. **Precontemplation** -not planning to take action in the near future, usually determined as next six months. Characteristics include avoidance, resistance to change, and lack of motivation.
2. **Contemplation**-intend to change within the next six months. Struggle with balance of costs and benefits associated with changing the behavior.
3. **Preparation for Action**-intend to change within the next month.
4. **Action**- made deliberate lifestyle change sufficient to reduce risks for disease within the last six months.
5. **Maintenance**- maintain lifestyle change in the range of six months to five years. Less tempted to relapse and have increased confidence in permanence of change.
6. **Termination** -maintain lifestyle change with zero temptation and 100% self-efficacy. No longer distinguished from those who never acquired the habit. (Monson & Engewick, 2005, p. 902).

The Clinical, Practice Guideline Treating Tobacco Use and Dependence Update Panel, Liaisons, and Staff (2008) mentioned in their study that "there is increasing evidence that the success of any tobacco dependence treatment strategies cannot be divorced from the health care system in which it is embedded" (p.162). Also, their conclusions and recommendations were consistent with those made by other organizations such as the American Psychiatric Association, American Medical Association, American Dental Association, American Nurses Association, American College of Obstetricians and Gynecologists, Institute of Medicine, United Kingdom Guideline, and Cochrane Collaboration (Clinical, Practice Guideline Treating Tobacco Use and Dependence Update Panel, Liaisons, and Staff, 2008). Riemsma et al. (2003) believe that interventions derived from stage theories of behavior change usually incorporate several key

elements, such as “to identify accurately an individual’s stage of change (or readiness to change), so that an intervention based on stage specific processes of change can be applied” (p.1).

The Five A’s Model for tobacco cessation is encouraged by the American Dental Hygienists’ Association and contains the following components as listed by the Agency for Healthcare Research and Quality: Ask about smoking, Advice smokers to stop, Assess the smoker's willingness to stop, Assist those smokers willing to stop, Arrange follow-up (2018, para 2). Regardless of the strategy utilized (Five A’s, Five R’s, or Stages of Change Theory) if patients remain not ready to quit, it is the dental hygienist’s duty to end positively with an open invitation to assist with tobacco cessation at any time (WHO, 2014).

A report from the 2009 U.S. Preventive Services Task Force (USPSTF) stated that “convincing evidence that behavioral interventions (including in-person behavioral support and counseling, telephone counseling, and self-help materials) alone or combined with pharmacotherapy substantially improve achievement of tobacco cessation in non-pregnant adults who smoke” (Siu, 2015, p. 624.). Stead et al. (2016) suggested: “methods have proven that behavioral support and certain pharmacotherapies increase the chance of successful cessation for people trying to quit” (p.14). Behavioral interventions are one of the major tobacco cessation, tools, “which can incorporate a person’s attitudes by influence of other individuals and norms (subjective norms) and ability to perform the behavior (perceived behavioral control) and intentions to perform the behavior, in order to predict a particular behavior” (Freeman et al., 2012, p. 6). Incorporating the guidelines of the Agency for Healthcare Research and Quality and the Transtheoretical Model (TTM) of behavioral change (also known as the stages of behavior change) demonstrated to be effective in identifying and treating tobacco users (Anczak & Nogler, 2003). Monson and Engeswick (2005) further explained how “health care providers

should utilize the appropriate steps to identify the patient's willingness to quit, help smokers who want to quit by providing expertise and resources, and help motivate patients unwilling to quit" (p. 902). Within 60 seconds of brief advice a health care provider, such as dental hygienist, can encourage the patient, provide information on the best way to stop, and offer support and treatment (Roberts et al., 2013).

During the initial treatment the healthcare provider should systematically ask all patients, at every visit, about tobacco use (Fiore et al., 2000; Lindsay et al., 1995). "Forms, stickers, electronic medical records, or computer reminder systems can be used to help remind health care providers to ask about tobacco use" (Monson & Engeswick, 2005, p. 903). The second step involves advising all tobacco users to quit (Fiore et al., 2000; Lindsay et al., 1995). Also, health care providers are advised to give clear and strong advice that is personalized. The conversation "should include advising patients of the benefits of quitting, using photos to demonstrate risks, deleterious oral effects (relating tobacco use to current health/illness, social and economic costs; however, scare tactics and negative approaches should be avoided, since these techniques tend to make the patient defensive" (Monson & Engeswick, 2005, p. 903). During the third step, it is best to assess the willingness of the tobacco user to make a quit attempt (Fiore et al., 2000). "The health care provider should tailor the counseling provided based on the tobacco user's readiness to change and identify which stage of change the tobacco user is in, utilizing the transtheoretical model (pre-contemplation, contemplation, preparation for action, or maintenance stage of change)" (Monson & Engeswick, 2005, p. 903). The fourth step is to assist tobacco users who are willing to quit by formulating a quit plan (Fiore et al., 2000). "The quit plan should include setting a date to quit, ideally within the following two weeks, along with social support; educational materials should also be implemented within the quit plan (discussion of withdrawal

symptoms and coping tips, referral resources, and nicotine replacement therapy)" (Monson & Engeswick, 2005, p. 903). The final step is to arrange a scheduled follow-up appointment for the tobacco user (Fiore et al., 2000; Lindsay et al., 1995). "A follow-up appointment with tobacco user should ideally occur within the first week after the quit date. Then, a second follow-up should occur within the first month (allowing the health care provider opportunity to congratulate the patient and assess if any problems have arisen" (Monson & Engeswick, 2005, p. 903). Studies provide results on how group therapy individual counseling, and telephone counseling have all been shown to be successful ways of delivering behavioral support for cessation with some support for individually tailored written self-help materials (Stead et al., 2016).

The World Health Organization (2014) recommended another approach that can be used by dental hygienist. The Five R's Model uses motivational counseling to encourage those who are not ready to quit and includes the following:

Relevance-Encourage the patient to indicate how to quitting is personally relevant to him or her.

Risks- Encourage the patient to identify potential negative consequences of tobacco use that are relevant to him or her.

Rewards-Ask the patient to identify potentially relevant benefits of stopping tobacco use.

Roadblocks- Ask the patient to identify barriers or impediments to quitting and provide treatment (problem-solving counselling, medication) that could address barriers.

Repetition- Repeat assessment of readiness to quit. If still not ready to quit repeat intervention at a later date. (WHO, 2014, p.13)

Behavioral interventions, and telephone counseling are still preferred; "… even brief behavioral interventions for smoking cessation are effective, and conventional (i.e., voice) telephone counseling has long been preferred by a majority of smokers (>75%) compared to face-to-face treatment programs" (McAfee, 2007, p. S364), and is "often well-received even by unmotivated smokers" (Bock et al., 2015; Stead et al., 2013). Behavioral interventions have been staying current by integrating delivery systems, such as texting and the internet. Use of mobile phones has saturated the general population and SMS text messaging is widely used, particularly among younger adults (those under age 35) (Bock et al. 2015). Suggesting to patients that they participate in a regular physical activity, such as walking, jogging, yoga, aerobic dancing, and etc., "… has been proposed as an aid for smoking cessation" (Hill, 1985; Ussher et al., 2014). Exercise has been shown to have some similarities to smoking in its effects on stimulating the central nervous system (Russell et al., 1983; Ussher et al., 2014). Ussher et al. (2014) stated that pursuing a regular exercise regimen can assist those who are attempting to stop smoking by reducing nicotine withdrawal symptoms and cravings.

Pharmacotherapy interventions can be divided into two groups: nicotine replacement therapy (NRT) and non-NRT. NRT increases abstinence rates by two to three times that of placebo (Fiori et al., 2000; Anczak & Nogler, 2003). Clinicians may recommend any of five pharmacotherapies: nicotine gum, nicotine patch, nicotine nasal spray, nicotine inhaler and non-NRTs (Anczak & Nogler, 2003). "Nicotine replacement therapy, bupropion and nortriptyline, and varenicline and cytosine increase quit rates" (Stead et al., 2016, p.14).

Factors Influencing the Provision of Tobacco Cessation Interventions by Dental Hygienists

Albert et al. (2005), Brothwell and Gelskey (2008), Croucher (2011) Helgason et al. (2003), Stacey et al. (2006), and Freeman et al. (2012) acknowledged the significant obstruction for dental hygienists in the adoption of tobacco intervention as distinguished in the international literature to include practitioner knowledge, skills, confidence, perceived patient resistance, time barriers, concerns of low effectiveness, and lack of reimbursement. Freeman et al. (2012) identified that the "barriers to dental hygienists' smoking cessation activity included lack of confidence, fear of alienating patients, and low perceived efficacy in regard to helping patients to quit" (p.6). Although, "interventions by dental hygienists have been found to achieve quit rates of 15% to 25%, as with other professions, adoption is often less than optimal" (Freeman et al., 2012, p. 5).

Dental Hygienists' Knowledge and Confidence Levels

Monson and Engeswick (2005) and Davis et al. (2010) found that approximately 90% of dental hygienists in their studies felt that tobacco cessation is part of their professional duty. However, this does not always transfer to actual practice. There are still several barriers involving dental hygienists' knowledge and confidence levels. Dental hygienists' confidence and knowledge must be built in their education experience. However, this is not always the case. "Lack of faculty time, student interest, current materials and a perceived lack of faculty expertise were their reasons for not fully integrating tobacco cessation strategies into patient care" (Coan et al., 2015, p. 191). Monson and Engeswick (2005) studied the promotion of tobacco cessation through dental hygiene education at Minnesota State University.

Fifty-one dental hygiene graduates participated and most of them worked in general practice, providing care for adult patient with average appointment times of 50 to 60 minutes (Monson &

Engewick, 2005). After graduation the graduates attended zero hours of continuing education on tobacco cessation, some of them reported smoking for a brief time, and none of them had any family members who smoked (Monson & Engewick, 2005).

"The lack of educational materials, such as brochures, has also been noted as a barrier to tobacco cessation counseling (TCC) in previous research" (Monson & Engeswick, 2005, p. 908). According to Monson and Engewick (2005) "effective TCC education during the formative years of education includes access to education materials, with an emphasis on how to obtain these materials after graduation" (p. 908).

It is not only essential for dental hygienists to have the knowledge, skills, time, and resources to provide tobacco cessation counseling, they must also be able to identify and/or create teachable moments. In other words, they must create the opportunity to implement tobacco cessation interventions (Mathur et al., 2015). Further, teaching dental hygienists how to determine which teachable moments are present or could be created to allow dental professionals to provide effective oral cancer risk communication, should be recommended as best practice (Mathur et al., 2015).

Dental Hygienists' Attitudes and Beliefs

From the beginning of a dental hygienist's professional career their overall view on smoking cession could be affected by their own self-doubt in their ability to be effective. Singla et al. (2014) agreed with Albert (2002) and Ibrahim and Norkhafizah (2008) noted:

> Several factors that might have contributed towards the lack of the counselling by the dental professionals includes lack of knowledge and attitude, professional and personal barriers including the lack of professional training, anticipated negative feedback from

> patients, fear of patients leaving the practice, lack of confidence in their ability and skills to provide effective counselling. (p. 15).

However, Pizzo et al. (2010) found that 84.44% of the dental student in the study and 87.5%, disagreed with the opinion that their recommendation regarding tobacco cessation made their patients uncomfortable. Similarly, the percentage of students who disagreed with the opinion that patients will consider dentists/dental hygienists as moralists if he/she recommends that he/she quit was 74.44% for dental students and 72.5% for dental hygiene students (Pizzo et al., 2010). According to Ford et al. (2015) smoking status, years of experience, and practitioner type influenced the smoking cessation attitudes and current practice activities. The trends for more positive attitudes and current practice in smoking cessation amongst dental hygienists are likely to reflect more years in practice (Ford et al., 2015).

The Effects of the Dental Hygienist's Smoking Status

As preventive therapists, dental hygienists are in a prime position to provide education about the damaging effects of tobacco and smoking cessation counseling to patients; however, "with this responsibility often comes the expectation to be a role model, and to practice what we preach; this begins as early as our dental education and training" (Hayes & Smith, 2013, p. 1). "Even if these clinicians assess smoking status and provide advice, they may not be seen as credible if their patients know they smoke" (Abdullah & Husten, 2004, p. 625). Smoking by health professionals is a barrier to implementing cessation interventions in the health care system since service providers are the key to initiating, designing, and implementing any such program (Abdullah & Husten, 2004). Pizzo et al. (2010) reported 37 (67.5%) of the dental hygiene students (DHS) were not smokers, whereas 13 (32.5%) described themselves as current smokers; the average number of years of smoking was just over six, with an average of 10.4 cigarettes

smoked per day. Interventions to reduce smoking among health care providers are an important first step, so that they can serve as role models for others and also promote cessation services in healthcare settings and schools (Abdullah & Husten, 2004). Lala et al. (2017) suggested "…dental professionals who are smokers may require training to develop their beliefs about the effectiveness of smoking cessation interventions" (p. 3).

The Importance of Building Capacity of Dental Hygienists in Provision of Tobacco Cessation Intervention

According to Studts et al. (2009) due to the importance of tobacco prevention and control, all health care providers are encouraged to implement evidence-based practices for treating tobacco use and dependence. There is increased attention to the dental setting as an opportunity to encourage smoking cessation (Freeman et al., 2012). "Health care providers have a vital role to play in helping users of both smoking and smokeless (spit) tobacco quit; tobacco interventions delivered by clinicians, including dental professionals, can increase abstinence rates" (Coan et al., 2015, p. 190). Dental hygienists could provide a unique and viable channel for reducing tobacco use and dependence (Walsh & Ellison, 2005). Studts et al. (2009) pointed out that there is large proportion of tobacco users who visit dental offices regularly, dental treatment provides an opportunity to point out to the patient the ill effects of tobacco use, and patients spend more time with dental hygienists compared to other health care providers. Additionally, dental hygienists have a stronger focus on prevention than do dentists and have more time to spend with patients, and report fewer barriers to providing smoking interventions that do dentists" (Freeman et al., 2012).

Summary

This literature review reveals numerous reasons why dental hygienists should always provide tobacco using patients with education and resources quit. The 5 A's model (Ask, Advise, Assess, Assist, Arrange) underpinned by the states of change theory (precontemplation, contemplation, preparation, action, maintenance, and termination) can provide dental hygienists with essential tools to help their patients. The literature also points out numerous reasons why dental hygienists do not always take advantage of their opportunities to help their tobacco using patients.

Chapter 3. Methodology

Overview

The American Dental Hygienists' Association and the Texas state laws that govern dental hygiene practice acknowledge that dental hygienists are appropriate health care providers to advocate for and assist with tobacco cessation for their patients. This project was a quantitative, a non-experimental cross-sectional research study designed to discover the attitudes and practices of a sample of dental hygienists with regard to tobacco cessation. An electronic survey was used to capture self-reported data from a sample of dental hygienists practicing in central Texas.

Sample Selection

Dental hygienists practicing in the central Texas counties of Bastrop, Bell, Coryell, Hays, Falls, Lampasas, Lee, and McLennan were chosen to participate in the study. These counties were selected because the current smoking rate within this region is 14-18%; the current smoking rate for the state is 14.4% (County Health Rankings, 2020). During the summer of 2020 there were approximately 2,000 hygienists practicing in these eight counties. Five hundred dental hygienists were randomly chosen to receive invitations to participate in the study.

Only dental hygienists who reported that they work in general dentistry, periodontics and government dental facilities (i.e. Military Dental Facility and/or Veterans Affairs) were included since they are the ones most likely to offer tobacco cessation counseling as part of their oral health care. Also, those who reported working less than four hours per week or were unemployed were excluded from the study. Potential participants were chosen randomly (every forth name until 500 was reached) from a list of names and addresses of licensed dental hygienists available on the Texas Board of Dentistry's web site.

Research Design

This quantitative research was cross-sectional and non-experimental designed to determine the dental hygienists' knowledge, confidence, belief, behavior, and practice of tobacco cessation interventions. "Non-experimental research designs are typically utilized when it is not practical, possible, feasible, or desirable to manipulate an independent variable…" (Cottrell & McKenzie, 2011, p.194). Therefore, the participants are selected based on the inclusion and exclusion criteria set, unlike in cohort studies and case-control studies. Cottrell and McKenzie (2011) described the cross-sectional study as a method that "…determines the current attitudes, opinions, beliefs, values, behaviors, or characteristics of a given population" (p. 196). "In a cross-sectional study, the investigator measures the outcome and the exposures in the study participants at the same time" (Setia, 2016, p. 261). The cross-sectional design allowed me to compare participants' behaviors and perceived challenges with tobacco cessation counseling based on their age, gender, and smoking status, level of education, years of practice, category of dentistry, and years of experience. Therefore, the study design provided a snapshot in time regarding tobacco cessation counseling among these participants.

Strengths and Limitations of the Design

The research design and data collection procedures allowed for relatively fast and inexpensive data collection. Data were captured that provided a snapshot in time of the behaviors and perceptions of the participants. Limitations were that the quantitative design did not allow for exploration as to all the reasons why participants behave or felt the way they do. Other limitations included self-reported data that may or may not be completely honest and the possibility for misinterpretation of questions as there was no face-to-face involvement with participants.

Survey Instrument Development

After a comprehensive review of the literature, I found one existing survey instrument that had been used in a study similar to mine and could be adapted for my study (Appendix A). I asked the authors of Amemori et al. (2011) permission to use their survey with adaptation (Appendix B). My adaptation is the addition of questions pertaining to socio-demographic information. Permission was granted for the use of the survey (Appendix C). Amemori et al. (2010) reviewed their survey for content validity with colleagues at Pirkanmaa Hospital District and Vaasa Central Hospital. To enhance the data analysis for this study, the socio-demographic questions on the participant's age, gender, smoking status, level of education, years of practice, category of dentistry, and years of experience were added. The Likert-scaled statements were to be used to assess knowledge, confidence, belief, behavior, and practice of tobacco cessation counseling.

Pilot Study

According to Hassan et al. (2006), "a pilot study is one of the important stages in a research project and is conducted to identify potential problem areas and deficiencies in the research instruments and protocol before implementation during the full study" (p.70). Amemori et al. (2011) included a pilot study; therefore, a pilot test will not be performed in this modified replication study.

Informed Consent

Participants were provided information regarding the study (Appendix D), including contact information of the investigator for further questions via the link to the survey which was provided on the invitation post card (Appendix E). All participants were asked to read the

information presented to them and were provided an opportunity to ask any questions concerning the study by contacting the researcher via email or phone. Participants were instructed that they agreed to participate by submitting their survey (Appendix D).

Data Collection Procedures

The staff member suggested one method for obtaining the master list of participants' addresses from the organization's website. A database of all of the dental hygienists' licenses was made available on that site. The information included city, county, zip code, specialty, date of birth, year graduated, school attended, method of licensure, the status of the license, gender, and mailing addresses (Texas State Board of Dental Examiners, 2020). Mailing addresses were used to connect the participants to the survey link and allow anonymity to be maintained. The survey link did not collect names, internet protocol (IP) addresses, nor physical addresses of the participants. There was no information collected through participation in the survey that could link the participant to the data collected. The participant informed consent was gained when the participant answered the first question of the survey—using the REDCap security technology and maintaining confidentiality.

According to Cottrell and McKenzie (2011), the researcher must be clear on the accurate response rate along with maintaining excellent collection effort results of the study. The postcards were mailed out on September 20, 2020, with an invitation to participate with a link to the electronic research survey to registered dental hygienists selected to participate in the study. October 5, 2020, a follow-up of the postcard statement with a linked was posted on Texas Central Texas Dental Hygiene Association, and Texas Dental Hygienist Connect social media site (Facebook). The participants were to ask to complete the survey (Appendix E) via REDCap

by October 14, 2020. After the initial mailing period, the data collection period was open for 25 working days.

Research Questions

This study was guided by the following questions.

1. Is there a relationship between barriers to care (knowledge) and capability of providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?
2. Is there a relationship between beliefs and confidence in providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?
3. Is there a relationship between beliefs and practices in providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?
4. Is there a relationship between capability and motivation in providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?
5. Is there a relationship between motivation and practices in providing tobacco cession counseling? If a relationship exists, what are the characteristics of the relationship?
6. Is there a relationship between years in practices and capability of providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?
7. Is there a relationship between years in practices and confidence of providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?

Survey questions 4, 7, 8, 9, 10, 11, and 12 addressed the relationship barriers of knowledge of dental hygienists in providing tobacco cessation counseling (research questions 1 and 4). Survey questions 3, 6, 10, 11, 12, 13, and 14 addressed the relationship of practices of dental hygienists in providing tobacco cessation counseling (research questions 3, 5, 6, and 7). Questions 21, 22, 23, 24, 40, 41, and 42 addressed the relationship of confidence of dental hygienists in providing tobacco cessation counseling (research questions 2 and 7). Questions 21 through 24 addressed the relationship of motivation of dental hygienists in providing tobacco cessation counseling (research questions 4 and 5). Questions 25 through 34 addressed the relationship of capability of dental hygienists providing tobacco cessation counseling (research questions 1 and 6). Questions 15 through 20 addressed the relationship of belief of dental hygienists in providing tobacco cessation counseling (research question 1). Questions 1-4, and 6 provide socio-demographic characteristics of the dental hygienists (research questions 6 and 7).

Data Analysis Procedure

Frequency distributions for each question as well as other descriptive statistics (mean, standard deviation, and range) were developed. “Descriptive statistics provide a summary of data in the form of mean, median and mode” (Ali & Bhaskar, 2016, p. 3). Descriptive statistics used in this research to help simplify the substantial volume of data and get the synopsis of the dental hygienist key behaviors on tobacco cessation. For analysis a numerical rating was assigned to each of the Likert-like scaled variables. The data is exported from REDCap into Excel and then transferred to Statistical Package for Social Studies (SPSS) Version 27.0 for analysis. The survey questions are organized according to the order they appeared on the survey. The answers of strongly disagree will be assigned a value of 1, disagree a value of 2, neutral a value of 3, agree a value of 4, and strongly agree a value of 5. Any questions with no responses will be excluded

from calculations. To analyzed the data a one-way analysis of variance (ANOVA) and Pearson Correlation Coefficients resulting from bivariate correlation analysis tests. All testing was interpreted at the 95% confidence level (alpha<.05). Frequencies were reported to adjusted and eliminate missing responses when composite score variables were computed.

Chapter 4. Results

Introduction

Tobacco cessation assistance is a challenging yet very necessary skill for dental hygienists. Patients presenting with tobacco addiction should not be lost opportunities for a dental practice. The relationships built with dental patients, the fact that dental hygienists often spend more time with their patients than many other health care professionals, and the preventive nature of dental hygiene services make the dental hygienist the perfect partner to assist with tobacco cessation. The purpose of this study was to determine the attitudes and practices of Registered Dental Hygienists in the central Texas region regarding tobacco cessation.

Respondents

One hundred sixty-eight surveys were returned for a 34% response rate. Fifteen participants working for pediatric dentistry were excluded, and 10 participants who did not full complete the survey were excluded as well. This yielded 143 respondents for analysis.

Demographics

The majority n=138 (96.5%) were female, two (1.4%) were male, and three (2.1) did not provide data. Sixty-three (44.4%) of the participants reported being between 20-30 years of the age. Forty (28.2%) of the participants reported being between 31-40 years of the age. Twenty-seven (18.9%) of the participants reported being between 41-50 years of the age. Ten (7.0%) of the participants reported being between 50 plus years of the age range; also, three (2.1%) of the participants did not answer. The number of years worked were: 77 (54.2%) 1-5 years, 30 (23.9%) 6-10 years, 20 (14.1%) 11-20 years, 9 (6.3%) 21 or more years, and 7 (4.9) of the dental hygienists (DH) did not provide an answer. There were 78 (55.3%) Associate of Science Degrees

(A.S), 50 (35.5%) Bachelor of Science Degrees (B.S), 10 (7.1%) Master of Science Degrees (M.S), none held doctoral degrees, and 5 (3.5%) of the DH did not answer.

Figure 1 shows tobacco usage data: 84 (58.7.5%) have never smoked, 19 (13.3%) are non-smokers (due to quitting), 20 (14.0%) currently smoke or vape, 13 (9.1%) used smokeless tobacco in the past, and 7 (4.9%) currently use smokeless tobacco.

Figure 1

Percentages of Tobacco Use of Dental Hygienists in central Texas Region

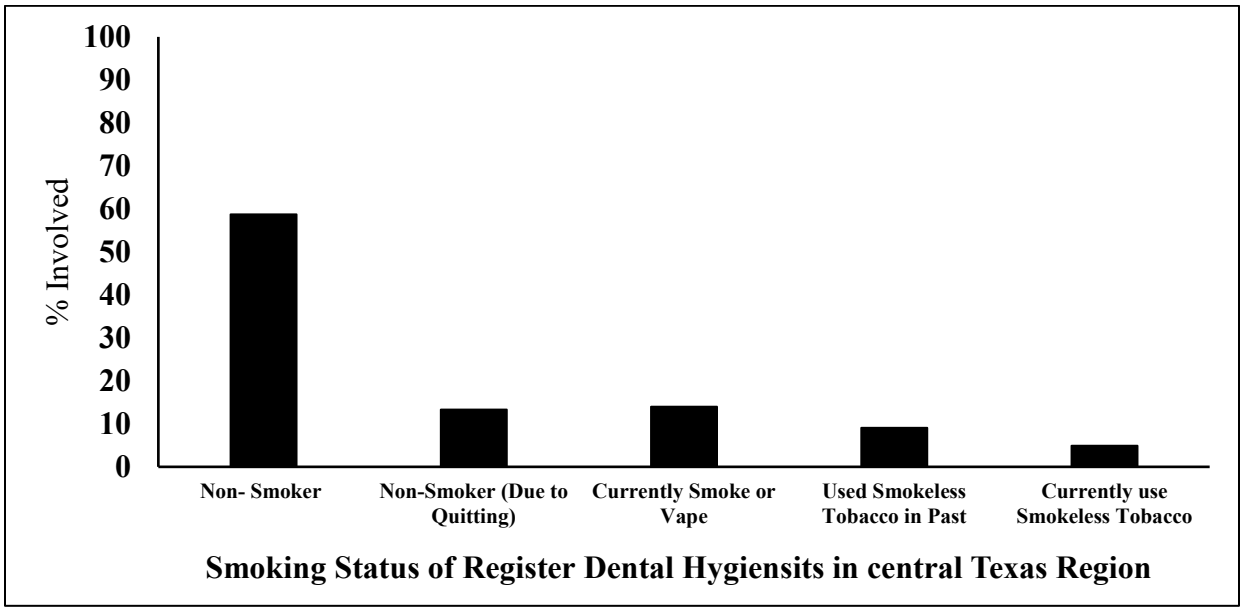
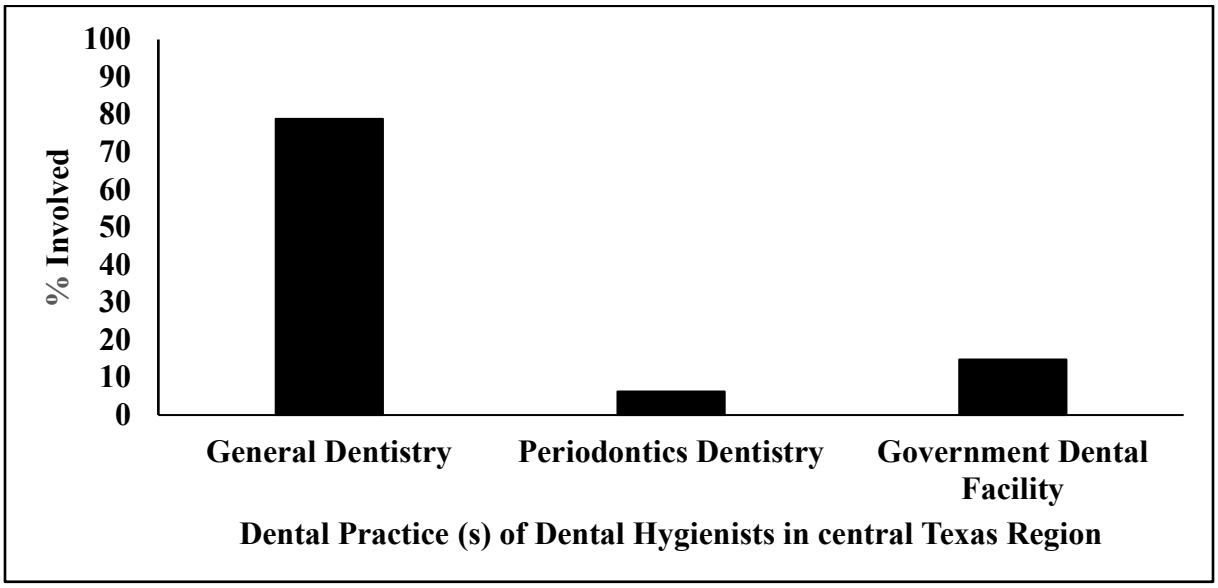


Figure 2 shows that 112 (78.9%) of those responding work in general dentistry, 9 (6.3%) work in periodontics, and 21 (14.8%) work in a government dental facility (i.e. military and/or Veterans Affairs).

Figure 2

Dental Hygienists' Employment in central Texas Region



Descriptive Statistics

Each of the 34 items in the survey addressed one or more aspects of the research questions. In this study, questions 27 and 28 were removed due to it is a replication of questions 25 and 26. Table 1 provides the details regarding the level of the respondent's knowledge, belief, capability, confidence, motivation, and tobacco cessation counseling practices. In the survey's knowledge component regarding tobacco cessation counseling most of the responses were distributed neutral, agreed, and strongly agreed with only a few participants, responding with strongly disagree or disagree. On the questions regarding professional roles almost all of the responses were neutral or agree; a small number were strongly disagreed or disagree. With regard to confidence (Motivation and Goals and Emotion) of dental hygienists in providing tobacco cessation counseling, nearly half of the responses were agreed, with a few neutral,

strongly disagree, or disagree. With regard to motivation and goals in providing tobacco cessation counseling, over half of the responses were neutral or agree. In the capability component (Memory, Attention, and Decision Process, and Environmental Context and Resources) in providing tobacco cessation counseling most of the participants' responses were agree; several were neutral or strongly agree. Only a few of the participant responses in capability components levels were strongly disagree, disagree, or strongly agree. Finally, in their belief component levels (Beliefs about Capabilities and Beliefs about Consequence) in providing tobacco cessation counseling, most of the participants' responses were neutral or agree.

Table 1

Distribution of Responses to Items Related to Tobacco Cessation Counseling

Knowledge	**Strongly Disagree 1**		**Disagree 2**		**Neutral 3**		**Agree 4**		**Strongly Agree 5**	
	f	***%***	***f***	***%***	***f***	***%***	***f***	***%***	***f***	***%***
7. I'm aware of the meanings and objectives of the Five A's recommended for tobacco cessation (Ask, Assess, Advise, Assist, and Arrange).	3	(2.1)	5	(2.1)	32	(22.4)	75	(52.4)	30	(21.0)

Continue Table 1.

	Strongly Disagree 1		Disagree 2		Neutral 3		Agree 4		Strongly Agree 5	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
8. I have sufficient therapeutic knowledge of the pharmaceutical products for tobacco cessation.	0	(0.0)	5	(3.5)	30	(21.0)	89	(62.2)	19	(13.3)
9. I don't know how to promote a tobacco-free lifestyle among adults and adolescents.	9	(6.3)	24	(16.8)	26	(18.2)	68	(47.6)	16	(11.2)
10. I know the appropriate questions to ask patients when providing tobacco use cessation counseling.	3	(2.1)	4	(2.8)	32	(22.4)	81	(56.6)	22	(15.4)
11. I am unsure how to assess patients in their efforts to stop tobacco use.	3	(2.1)	26	(18.2)	27	(18.9)	71	(49.7)	14	(9.8)

Continue Table 1.

	Strongly Disagree 1		Disagree 2		Neutral 3		Agree 4		Strongly Agree 5	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
12. Sufficient opportunities are available for me to learn about promoting a tobacco-free lifestyle.	1	(0.7)	13	(9.1)	23	(16.1)	92	(64.3)	13	(9.1)
Professional Role and Identity										
13. Most of my colleagues in this clinic believe that promoting tobacco abstinence is an important part of their professional identity.	1	(0.7)	10	(7.0)	39	(27.3)	74	(51.7)	19	(13.3)
14. Counseling for cessation is not an efficient use of my time.	6	(4.2)	24	(16.8)	28	(19.6)	72	(50.3)	12	(8.4)

Continue Table 1.

Beliefs about Capabilities	**Strongly Disagree 1**		**Disagree 2**		**Neutral 3**		**Agree 4**		**Strongly Agree 5**	
	f	***%***	***f***	***%***	***f***	***%***	***f***	***%***	***f***	***%***
15. I am confident in my abilities to prevent patients from using tobacco products.	3	(2.1)	10	(7.0)	32	(22.4)	84	(58.7)	13	(9.1)
16. I am able to make decisions about the risks/benefits of the appropriate use of nicotine replacement therapy.	2	(1.4)	9	(6.3)	34	(23.8)	88	(61.5)	10	(7.0)
17. I have the skills to monitor and assist patients throughout their quit attempt.	4	(2.8)	11	(7.7)	32	(22.4)	85	(59.4)	11	(7.7)
Beliefs about Consequence										
18. My counseling will increase a patient's likelihood of quitting.	0	(0.0)	4	(2.8)	46	(32.2)	79	(55.2)	14	(9.8)

Continue Table 1.

	Strongly Disagree 1		Disagree 2		Neutral 3		Agree 4		Strongly Agree 5	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
19. Patients appreciate it when I promote tobacco abstinence.	0	(0.0)	5	(3.5)	45	(31.5)	79	(55.2)	14	(9.8)
20. The patients we see in our clinic/department have so many other problems in their lives that stopping tobacco use is a very low priority for them.	1	(0.7)	13	(9.1)	41	(28.7)	79	(55.2)	9	(6.3)
Motivation and Goals										
21. I am unwilling to work on improving my provision of tobacco cessation services.	9	(6.3)	22	(15.4)	29	(20.3)	69	(48.3)	14	(9.8)

Continue Table 1.

	Strongly Disagree 1		Disagree 2		Neutral 3		Agree 4		Strongly Agree 5	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
22. The importance of patient health helps me to overcome barriers such as lack of time and reimbursement in promoting a tobacco-free lifestyle.	1	(0.7)	2	(1.4)	37	(25.9)	87	(60.8)	16	(11.2)
23. I receive insufficient reimbursement for promoting tobacco abstinence.	9	(6.3)	8	(5.6)	35	(24.5)	77	(53.8)	14	(9.8)
24. I have insufficient time to promote tobacco abstinence.	1	(0.7)	14	(9.8)	34	(23.8)	81	(56.6)	13	(9.1)
Memory, Attention, and Decision Process										

Continue Table 1.

	Strongly Disagree 1		Disagree 2		Neutral 3		Agree 4		Strongly Agree 5	
	f	*%*	*f*	*%*	*f*	*%*	*f*	*%*	*f*	*%*
25. Deciding whether to promote tobacco abstinence is sometimes difficult.	6	(4.2)	19	(13.3)	36	(25.2)	70	(49.0)	12	(8.4)
26. Reinforcing tobacco abstinence is easy for me to remember.	2	(1.4)	8	(5.6)	30	(21.0)	91	(63.6)	12	(8.4)
Environmental Context and Resources										
29. My dental clinic has no tobacco-related self-help materials/pamphlets to distribute to patient.	3	(2.1)	22	(15.4)	27	(18.9)	80	(55.9)	11	(7.7)
30. Our dental clinic has a system to provide follow-up support between clinic visits.	8	(5.6)	15	(10.5)	34	(23.8)	76	(55.1)	9	(6.3)

Continue Table 1.

	Strongly Disagree 1		Disagree 2		Neutral 3		Agree 4		Strongly Agree 5	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
31. Our dental clinic has a system to cue/prompt providers to counsel against tobacco use.	12	(8.4)	19	(13.3)	31	(21.7)	74	(51.7)	7	(4.9)
32. Our clinic management has taken actions to remove barriers to the provision of tobacco use counseling.	7	(4.9)	17	(11.9)	32	(22.4)	75	(52.4)	11	(7.7)
33. In the dental clinic where I work, I receive no feedback from promoting tobacco abstinence.	0	(0.0)	16	(11.2)	23	(16.1)	85	(59.4)	19	(13.3)

Continue Table 1.

	Strongly Disagree 1		Disagree 2		Neutral 3		Agree 4		Strongly Agree 5	
	f	*%*	*f*	*%*	*f*	*%*	*f*	*%*	*f*	*%*
34. My dental clinic provides insufficient reimbursement for promoting tobacco abstinence.	4	(2.8)	13	(9.1)	33	(23.1)	77	(53.8)	16	(11.2)
Social Influences										
35. Our clinic/department generally supports improving the way in which we promote a tobacco-free lifestyle.	2	(1.4)	6	(4.2)	39	(27.3)	86	(60.1)	10	(7.0)
36. Most patients do not want to receive tobacco counseling.	1	(0.7)	17	(11.9)	42	(29.4)	70	(49.0)	13	(9.1)

Continue Table 1.

	Strongly Disagree 1	**Disagree 2**	**Neutral 3**	**Agree 4**	**Strongly Agree 5**
	f ***%***	***f*** ***%***	***f*** ***%***	***f*** ***%***	***f*** ***%***
37. There is at least one respected individual in our dental clinic that is personally committed to leading our efforts to improve our provision of tobacco cessation services.	7 (4.9)	17 (11.9)	30 (21.0)	77 (53.8)	12 (8.4)
38. My role does not involve assisting patients to stop tobacco use	14 (9.8)	19 (13.3)	32 (22.4)	67 (46.9)	11 (7.7)
39. Most patients want to receive tobacco use cessation counseling.	3 (2.1)	14 (9.8)	41 (28.7)	75 (52.4)	10 (7.0)
Emotion	**Strongly Disagree 1**	**Disagree 2**	**Neutral 3**	**Agree 4**	**Strongly Agree 5**

Continue Table 1.

	f	%	*f*	%	*f*	%	*f*	%	*f*	%
40. Helping with tobacco cessation makes me feel useful to patients.	1	(0.7)	1	(0.7)	33	(23.1)	81	(56.6)	27	(18.9)
41. I find counseling patients about tobacco to be frustrating.	5	(3.5)	20	(14.0)	36	(25.2)	71	(49.7)	11	(7.7)
42. Burn-out prevents me from providing more tobacco use cessation counseling.	3	(2.1)	18	(12.6)	41	(28.7)	71	(49.7)	10	(7.0)

Perceptions of barriers to providing tobacco cessation counseling were determined using a self-evaluation online survey; therefore, it evaluated the participants' beliefs regarding capability, confidence, motivation, and practices. Subscales were developed to determine the mean score of the survey's major categories (knowledge, roles and identity, capabilities, consequences, memory, environmental and social). Descriptive statistics for each of the subscales can be found in Figure 3.

Figure 3

Descriptive Statistics Subscale

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic
Knowledge	141	1.83	5.00	3.6868	.56746
Role and Identity	142	1.50	5.00	3.5599	.75438
Capabilities	142	1.33	5.00	3.6455	.68671
Consequences	143	2.67	5.00	3.6690	.56984
Memory, Attention, Decision	143	1.50	5.00	3.5804	.65448
Environmental Context	141	1.83	5.00	3.5225	.63721
Social Influences	143	1.80	5.00	3.5035	.69072
Valid N (listwise)	138				

Bivariate Correlation Analysis

Linear regression was used to evaluate the following 1-6 research questions.

1. Is there a relationship between barriers to care (knowledge) and capability of providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?

   A positive significant, moderate, relationship was found between the knowledge and capability subscales (r=0.579).

2. Is there a relationship between beliefs and confidence in providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?

A positive significant, moderate, relationship was found between the beliefs and confidence subscales (r=0.647).

3. Is there a relationship between beliefs and practices in providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?

   A positive significant, moderate, relationship was found between the beliefs and practices subscales (r=0.704).

4. Is there a relationship between capability and motivation in providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?

   A positive significant, moderate, relationship was found between the motivations and capabilities subscales (r=0.529).

5. Is there a relationship between motivation and practices in providing tobacco cession counseling? If a relationship exists, what are the characteristics of the relationship?

   A positive significant, moderate, relationship was found between the motivations and practice subscales (r=0.605).

6. Is there a relationship between years in practices and capability of providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?

   A positive significant, moderate, relationship was found between the years of practice and capabilities subscales (r=0.699).

One Way Analysis of Variance (ANOVA)

For research question number 7 a one-way ANOVA test was used for analysis.

1. Is there a relationship between years in practices and confidence of providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?

Using a 95% confidence interval, there was a significant difference in confidence based upon age (p=.001). Using Tukey's post-hoc testing the mean scores for hygienists with more than 20 years of experience differed from those with 1-5 years of experience (p=.003) and 6-10 years of experience (p=.025). No other differences were found.

Summary

The data show positive significant, moderate relationships between knowledge and capability, beliefs and confidence, beliefs and practices, motivation and capability, motivation and practices, and years of practice and capability. Additionally, hygienists with 20 or more years of practice were significantly more confident in their ability to provide tobacco cessation counseling.

Chapter 5. Conclusions, Discussion, and Recommendations

Overview

Dental hygienists are licensed oral health professionals who focus primarily on preventing both oral diseases and protecting patients' total health (American Dental Hygienists' Association, 2016). Texas licensed dental hygienists may receive verbal or written authorization to perform any function that has been duly licensed under the direct supervision of a dentist (State Board of Dental Examiners, 2017). According to DeLong and Burkhart (2013) in collaboration with the dentist, the dental hygienist may be the person who assists the patient in obtaining the necessary care. Also, Texas Health and Human Services (2018) advised that oral health education may be provided and documented by a licensed dentist, dental hygienist, dental assistant, and dental case manager; providers must demonstrate oral health education once a year, which includes, but is not limited to the following: oral hygiene instruction (OHI), smoking/tobacco cessation counseling, and nutrition.

According to Studts et al. (2009) due to the importance of tobacco prevention and control, all health care providers are encouraged to implement evidence-based practices for treating tobacco use and dependence. There is increased attention to the dental setting as an opportunity to encourage smoking cessation (Freeman et al., 2012). "Health care providers have a vital role to play in helping users of both smoking and smokeless (spit) tobacco quit; tobacco interventions delivered by clinicians, including dental professionals, can increase abstinence rates" (Coan et al., 2015, p. 190). Dental hygienists could provide a unique and viable channel for reducing tobacco use and dependence (Walsh & Ellison, 2005). Studts et al. (2009) pointed out that there is large proportion of tobacco users who visit dental offices regularly, dental treatment provides an opportunity to point out to the patient the ill effects of tobacco use, and

patients spend more time with dental hygienists compared to other health care providers. Even when the need for tobacco cessation is evident, not all dental hygienists are willing or able to offer it; studies have shown some of the reasons are that the dental hygienists are still overcoming barriers such as a perceived lack of time, knowledge, training, anticipated patient resistance, and reimbursement issues (Monson, 2004; Hanioka et al., 2013; Petersen, 2005). The purpose of this study was to gain a better understanding of the tobacco cessation practices among central Texas dental hygienists.

Research Questions

This study was guided by the following questions.

1. Is there a relationship between barriers to care (knowledge) and capability of providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?
2. Is there a relationship between beliefs and confidence in providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?
3. Is there a relationship between beliefs and practices in providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?
4. Is there a relationship between capability and motivation in providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?
5. Is there a relationship between motivation and practices in providing tobacco cession counseling? If a relationship exists, what are the characteristics of the relationship?

6. Is there a relationship between years in practices and capability of providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?
7. Is there a relationship between years in practices and confidence of providing tobacco cessation counseling? If a relationship exists, what are the characteristics of that relationship?

Conclusions

The Tobacco Cessation Counseling Practices amongst Dental Hygienists in Central Texas study was conducted from September 2020 through October 2020. Dental hygienists practicing in the central Texas counties of Bastrop, Bell, Coryell, Hays, Falls, Lampasas, Lee, and McLennan were chosen to participate in the study. Approximately 2,000 hygienists' practice in these eight counties; however, only 500 dental hygienists were randomly selected to receive invitations to participate in the study which yielded 143 surveys for analysis.

The results of this study showed the participants' overall subscale mean score of knowledge in providing tobacco counseling was 3.69 out of 5; role and identity mean score was 3.56 out of 5; capabilities mean score was 3.65 out of 5; consequences mean score was 3.67 out of 5; memory, attention, and decision process mean score was 3.58 out of 5; the environmental context mean score was 3.52 out of 5, and social influences mean score was 3.50 out of 5. These mean scores indicate that most respondents report average ability, motivation, knowledge, and confidence with regard to tobacco cessation counseling, suggesting room for improvement.

Bivariate Correlation test found that the relationship between barriers to care (knowledge) and the capability to provide tobacco cessation counseling was significant positive moderate relationships *(r=0.579).* Likewise, in the beliefs and confidence *(r=0.647)*, beliefs and

practices subscale *(r=0.704)*, capability and motivation *(r=0.529)*, motivation and practices *(r=0.605)*, years in practice and capability *(r=0.699)* to provide tobacco cessation counseling all showed positive significant and moderate relationships. These results indicate that dental hygienists are more likely to provide tobacco cessation counseling if they are confident in their knowledge and are motivated to do so. Further, those with more years of practice show higher levels of confidence.

The ANOVA test showed the relationship between years in practice and confidence in providing tobacco cessation counseling significantly differed. The Tukey's post hoc test showed hygienists' confidence mean scores with more than 20 years of experience differed from those with 1-5 years of experience *(p=.003)* and 6-10 years of experience *(p=.025)* indicating more confidence among those who have practiced for the longest periods of time.

Discussion

The results show that overall, the Texas dental hygienists are aware of the Five A's as a tobacco cessation tool and have sufficient therapeutic knowledge of the pharmaceutical products for tobacco cessation, but do not know how to promote a tobacco-free lifestyle among adults and adolescents. This is in agreement with Carr and Ebbert (2012) who corroborated Block (1999) "dental healthcare providers were still less likely to report having strong knowledge or skill levels regarding tobacco cessation, and more likely to perceive barriers to tobacco intervention" (p. 3). With regard to the dental hygienists' role in providing tobacco cessation counseling, almost all responses were neutral or agree, indicating that they do not disagree that tobacco cessation is appropriate for their role as oral health providers. However, they are still unsure how to assess patients' efforts to stop and felt that counseling for cessation is not an efficient use of their time. Again, these results mirror Block's (1999) findings that a dental practitioner is less consistent with and supportive of intervention.

In the confidence components of the survey, the majority of the dental hygienists indicated that they felt their efforts could help people stop using tobacco and that those efforts would be appreciated, but they also indicated that they did not think tobacco cessation was a priority for their patients. Being overwhelmed when providing counseling to their patients about tobacco was frustrating, and feelings of burn-out prevent them from delivering more tobacco use counseling. Tomar (2001) cited that about 60% of tobacco users were not routinely advised to quit during the patient dental visit. In the motivation component levels in providing tobacco cessation counseling, over half of the responses were neutral or agree. Dental hygienists completing this survey showed unwillingness to work on improving their provision of tobacco cession services due to barriers such as lack of time and insufficient reimbursement for promoting tobacco abstinence which mirrors what was found in the literature (Monson, 2004; Hanioka et al., 2013; Petersen, 2005). Both Tomar (2001) and Fione et al. (2001) agreed, "[r]elative to other reimbursed treatments, treatment of tobacco use and dependence is a highly cost-effective intervention, and the dental clinician should be fairly compensated for their services" (p.335).

In the capability component levels in providing tobacco cessation counseling most participants' agreed that deciding whether or not to include tobacco abstinence is sometimes difficult and that it is also difficult to remember to include it. Additionally, the majority said their offices do not have any tobacco-related self-help materials to distribute, or prompts to cue providers to counsel against tobacco use. The vast majority receive no positive feedback from their employers for promoting tobacco abstinence. Although most of the survey respondents appear to have confidence in their abilities to prevent patients from using tobacco products and to help them make decisions about the risk/benefits of the appropriate use of nicotine

replacement therapy, and further that their counseling could indeed increase the likelihood of quitting, they also believe that quitting is not a priority for their patients, they do not have time to provide the service, and there is little motivation within their dental offices for tobacco cessation.

Recommendations for Supporting a Tobacco Free-Life Style

Based on these findings I offer the following list of recommendations on how dental hygienists can be more involved in promoting a tobacco-free life style for their patients.

Recommendations are:

1. **Patient-centered interviewing style:** Putting the patient in the driver's seat by allowing them to be involved in their treatment plan. By motivating and encouraging them to remove the self-doubt of never quitting smoking or smokeless tobacco (there are many options available to them); therefore, they increase their nicotine usage awareness.

2. **Do not give up:** It is important to figure out where the patient is in the continuum between no desires to quit and highly motivated to quit. Continue to gently move the patient up the ladder toward quitting. It is the dental hygienist's duty to always include brief tobacco cessation counseling.

3. **Make change within your dental offices:** Ask the dentist and practice manager for more help in providing pamphlets and other available resources. Ask for more time to be set aside for tobacco cessation counseling.

4. **Be a role model:** The dental hygienist should be practicing a tobacco free-life style. Be willing to have the confidence and skills to advise the patient. Also, if others in the dental offices do not speak to patients about quitting smoking, the dental hygienist should

continue to do so. By being a leader on this issue perhaps the hygienist can inspire the rest of the dental team members.

5. **Provide incentives and cessation resources:** Make sure patients are aware they will need social support and encouragement, such as family members and friends. Utilize the Texas free hotlines (http://www.yesquit.org/; https://smokefree.gov/smokefreetxt, or request a free Starter Kit at 1-877-879-6422), download smartphone apps (Quit Now, Smoke-Free or Quit Tracker.), and suggest nicotine replacement and other products to assist quitting. Check to see if the patient's dental insurance plan includes tobacco cessation. Lastly, patients always want white teeth; get your dental office to offer complimentary in-office teeth whitening and an electric toothbrush once they have sustained three months tobacco-free.

Future Research

This cross-sectional research study could be replicated in other regions of Texas, as well as other states. It would be helpful to correlate tobacco use rates with the level of tobacco cessation efforts among oral health professionals in specific geographic regions. Similar studies also need to be done with dentists, as they are the ones who set the tone for the dental practice and have prescriptive authority for tobacco cessation pharmaceuticals; it would be helpful to know if dentists are taking advantage of their opportunities in this area. A follow-up qualitative study could also add depth and further understanding of the barriers perceived by dental hygienists with regard to tobacco cessation. Further, a collaborative study of dental patients, dental providers, and public health professionals might yield ways that tobacco cessation could be improved on the community level. Professional organizations, such as the Texas Dental Hygienists' Association could benefit from research findings, such as studies like this one, to

promote the interprofessional role of dental hygienists in overall health. As professional oral health care providers, it is imperative that dental hygienists take advantage of opportunities to assist their patients with tobacco cessation. Encouragement from their employers and standards set by their professional organizations could be very helpful.

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APPENDICES

Appendix A: Survey

Socio-Demographic Characteristics
Background

Please select one response for each question.

1. Gender
   - Male
   - Female
2. Are you in the age group of?
   - 20-30
   - 31-40
   - 41-50
   - 50+
3. How long have you been working as dental hygienist?
   - 1-5 years
   - 6-10 years
   - 11-20 years
   - 21+
4. What is your highest level of education?
   - Associate's degree
   - Bachelor's degree
   - Master's degree
   - Doctorate
5. What is your status as tobacco user? Check all that apply.
   - Non-smoker (no history of tobacco use)
   - Non-smoker (due to quitting)
   - Currently smoke or vape
   - Used smokeless tobacco in past
   - Currently use smokeless tobacco
6. What type of the dental practice(s) do you work for?
   - General Dentistry
   - Pediatric Dentistry
   - Periodontics Dentistry
   - Government (i.e. Military Dental Facility and/or Veterans Affairs)

Please select one response for each question 7 through 42.

• 1 = Strongly disagree; • 2 = Disagree; • 3 = Neutral; • 4 = Agree; • 5 = Strongly agree

Knowledge	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
7. I'm aware of the meanings and objectives of the Five A's recommended for tobacco cessation (Ask, Assess, Advise, Assist, and Arrange).	○	○	○	○	○
8. I have sufficient therapeutic knowledge of the pharmaceutical products for tobacco cessation.	○	○	○	○	○
9. I don't know how to promote a tobacco-free lifestyle among adults and adolescents	○	○	○	○	○
Skills	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
10. I know the appropriate questions to ask patients when providing tobacco use cessation counseling.	○	○	○	○	○
11. I am unsure how to assess patients in their efforts to stop tobacco use	○	○	○	○	○
12. Sufficient opportunities are available for me to learn about promoting a tobacco-free lifestyle	○	○	○	○	○
Professional Role and Identity	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
13. Most of my colleagues in this clinic believe that promoting tobacco abstinence is an important part of their professional identity.	○	○	○	○	○
14. Counseling for cessation is not an efficient use of my time.	○	○	○	○	○

Beliefs about Capabilities	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
15. I am confident in my abilities to prevent patients from using tobacco products.	○	○	○	○	○
16. I am able to make decisions about the risks/benefits of the appropriate use of nicotine replacement therapy.	○	○	○	○	○
17. I have the skills to monitor and assist patients throughout their quit attempt.	○	○	○	○	○
Beliefs about Consequence	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
18. My counseling will increase a patient's likelihood of quitting.	○	○	○	○	○
19. Patients appreciate it when I promote tobacco abstinence.	○	○	○	○	○
20. The patients we see in our clinic/department have so many other problems in their lives that stopping tobacco use is a very low priority for them.	○	○	○	○	○
Motivation and Goals	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
21. I am unwilling to work on improving my provision of tobacco cessation services.	○	○	○	○	○
22. The importance of patient health helps me to overcome barriers such as lack of time and reimbursement in promoting a tobacco-free lifestyle	○	○	○	○	○
23. I receive insufficient reimbursement for promoting tobacco abstinence.	○	○	○	○	○
24. I have insufficient time to promote tobacco abstinence.	○	○	○	○	○
Memory, Attention, and Decision Process	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
25. Deciding whether to promote tobacco abstinence is sometimes difficult.	○	○	○	○	○

26. Reinforcing tobacco abstinence is easy for me to remember.	○	○	○	○	○
Memory, Attention, and Decision Process	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
27. Deciding whether to promote tobacco abstinence is sometimes difficult.	○	○	○	○	○
28. Reinforcing tobacco abstinence is easy for me to remember.	○	○	○	○	○
Environmental Context and Resources	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
29. My dental clinic has no tobacco-related self-help materials/pamphlets to distribute to patient.	○	○	○	○	○
30. Our dental clinic has a system to provide follow-up support between clinic visits.	○	○	○	○	○
31. Our dental clinic has a system to cue/prompt providers to counsel against tobacco use.	○	○	○	○	○
32. Our clinic management has taken actions to remove barriers to the provision of tobacco use counseling.	○	○	○	○	○
33. In the dental clinic where I work, I receive no feedback from promoting tobacco abstinence.	○	○	○	○	○
34. My dental clinic provides insufficient reimbursement for promoting tobacco abstinence.	○	○	○	○	○
Social Influences	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
35. Our clinic/department generally supports improving the way in which we promote a tobacco-free lifestyle.	○	○	○	○	○
36. Most patients do not want to receive tobacco counseling.	○	○	○	○	○
37. There is at least one respected individual in our dental clinic that is personally committed to leading our efforts to improve our provision of tobacco cessation services.	○	○	○	○	○
38. My role does not involve assisting patients to stop tobacco use	○	○	○	○	○

39. Most patients want to receive tobacco use cessation counseling.	○	○	○	○	○
Emotion	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
40. Helping with tobacco cessation makes me feel useful to patients.	○	○	○	○	○
41. I find counseling patients about tobacco to be frustrating.	○	○	○	○	○
42. Burn-out prevents me from providing more tobacco use cessation counseling.	○	○	○	○	○

Appendix B: Request Letter for Permission to use the Survey

Lacy Murray or Deborah Dotson
East Tennessee State University
Department of Allied Health Sciences
P.O. Box 70690
Johnson City, TN 37614

Dear Springer Nature,
I am a graduate student from East Tennessee State University writing my thesis titled *Tobacco Cessation Counseling Practices amongst Dental Hygienist in Central Texas,* under the direction of my thesis committee chaired by Dr. Deborah Dotson, who can be reached at (423) 439-7888 or dotsond@mail.etsu.edu.

The journal I would like to use is called *Assessing implementation difficulties in tobacco use prevention and cessation counselling among dental providers* by Amemori et al (2011).
I would like your permission to use the Table1, it has the 35-item *Theoretical Domains Relevant to The Implementation Behaviors of Healthcare Providers'* survey/questionnaire instrument in my research study. I would like to use and print your survey under the following conditions:
I will use the surveys only for my research study and will not sell or use it with any compensated or curriculum development activities.

I will include the copyright statement on all copies of the instrument.
I will send a copy of my completed research study to your attention upon completion of the study.
If these are acceptable terms and conditions, please indicate so by replying to me at your earliest convenience through e-mail: MURRAYL1@etsu.edu.

Thank you for your time.

Sincerely,

Lacy Murray, RDH

Lacy Murray, RDH, BS

Appendix C: Permission to use the Survey Granted

The following e-mail was received from Spring Nature:

Spring Nature Journal Permissions < journalpermissions@springernature.com
Wed 5/6/2020 8:36 AM

Dear Lacy,

Thank you for your recent Springer Nature permissions enquiry.

This work is licensed under the Creative Commons Attribution 4.0 International License, which permits unrestricted use, distribution, modification, and reproduction in any medium, provided you:

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If you have any questions or concerns, please feel free to contact me directly.

Kind regards,

Paloma Hammond
Rights Assistant

SpringerNature
The Campus, 4 Crinan Street, London N1 9XW, United Kingdom

Appendix D: Invitation and Informed Consent for Participants

Dear Dental Hygienist,

My name is Lacy Murray, I am a fellow Texan, a licensed dental hygienist, and an online graduate student at East Tennessee State University in the Masters of Science in Allied Health program. I am asking you to participate in a research study on tobacco cessation that I am completing for my thesis. You will be asked about your knowledge, interest, confidence, and experience with regard to providing tobacco cessation for your patients.

Your participation involves completing an online survey that should only take 15-20 minutes of your time. Completing this survey is totally voluntary. You can certainly decline participation by simply not applying to the survey link https://redcap.link/centraltexas. Once login on to the survey link you can quit the survey at any time, simply by not submitting and exiting, and you can answer only the questions that you want to. There is no risk to you in participation in this study. Please note that participation is completely anonymous and no identifying information will be collected. I am using Redcaps as the online survey platform and am not collecting IP addresses or any other information that could be tracked to you. I have no need or desire to know who answered the survey and who did not. Your complete anonymity will be protected. Results of the research project will be used for scholarly purposes only and my completed thesis may be provided to persons outside the study for the purposes of improving oral health care practices. However, please be assured that information provided by you can in no way to linked to you.

If you have questions about this study or research-related questions or problems, please feel free to contract me, at MURRAYL1@etsu.edu or my thesis chair, Dr. Deborah Dotson at dotsond@etsu.edu or (423) 439-7888. You may also call the chairperson of the IRB at ETSU at (423) 439-6054 if you have question about your rights as a research subject. If you have any questions or concerns about research and want to talk to someone who is not with the research team or if you cannot reach the research team, you may call an IRB Coordinator at (423) 439-6055 or (423) 439-6002. By submitting your survey, you are consenting to participate in this study. The link to the survey is at the bottom of this email.
Thank you very much for your help! I could not complete my thesis without you!

Best regards,

Lacy Murray

Lacy Murray, RDH, BS
MURRAYL1@etsu.edu

By clicking on the link below, I acknowledge the following:
1. I am currently employed as a dental hygienist in the State of Texas.
2. I have read and understand this informed consent document.
3. I voluntarily agree to participate in the research study.

To participate in the research project click below:

- o I agree to participate in this study
- o I do not agree to participate in this study

Appendix E: Post Card & Follow-up Reminder

Registered Dental Hygienists,

You are invited to participate in a research study being conducted by Lacy Murray, a graduate student in the Masters of Allied Health at East Tennessee State University.

The research seeks to determine the attitudes and practices of Registered Dental Hygienists in central Texas region with regarding tobacco cessation.

Your participation is much appreciated.
The research link is available until **October 14, 2020**.
For more information or to participate in this study, go to the following link:

https://redcap.link/centraltexas

VITA

LACY MURRAY

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