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Mid-Level Dental Care Provider:
Awareness and Attitudes of Ohio's Dental Hygienists

A thesis
presented to
the faculty of the Department of Allied Health Sciences
East Tennessee State University

In partial fulfillment
of the requirements for the degree
Master of Science in Allied Health

by
Cynthia S. Leverich
December 2016

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Dr. Randy L. Byington

Keywords: access to care, mid-level dental provider, underserved, expanded role of the dental hygienist, Advanced Dental Hygiene Practitioner

ABSTRACT

Mid-Level Dental Care Provider:

Awareness and Attitudes of Ohio's Dental Hygienists

by

Cynthia S. Leverich

The purpose of this study was to determine the awareness and attitudes of dental hygienists in Ohio regarding the Advanced Dental Hygiene Practitioner (ADHP) proposed by the American Dental Hygienists' Association (ADHA).

I developed a survey to assess dental hygienists' awareness and attitudes regarding the new mid-level dental provider. The study was limited to licensed dental hygienists in Ohio. The study included a simple random sample of 400 of the 4100 dental hygienists in Ohio. The method of data collection was electronic surveys. Fifty-four dental hygienists (13% of the sample) participated in the study.

The results show that most of those responding were aware of the ADHP. Also, their attitude regarding the new mid-level dental provider was positive. There was no consensus among respondents regarding the ADHP as a viable career option. More research is needed on the viability of the ADHP in Ohio.

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CHAPTER 1

INTRODUCTION

An individual's oral health is a reflection of the status of their overall health. "Oral health is essential to overall health. Good oral health improves a person's ability to speak, smile, smell, taste, touch, chew, swallow, and make facial expressions to show feelings and emotions. However, oral diseases, from cavities to oral cancer, cause pain and disability for many Americans" (U. S. Department of Health and Human Services, 2014, p. 1). Many of the most common diseases in the United States, including diabetes and cardiovascular disease, are linked to dental diseases such as gingivitis and periodontitis. "Diabetics were 28% more likely to become fully edentulous or partially edentulous; 1 in every 5 cases of edentulism is linked to diabetes" (Dahm, Bruhn, & LeMaster, 2015, p. 229).

"Numerous studies have confirmed unequivocally that diabetes is a major risk factor for periodontitis, and the risk of periodontitis is increased approximately threefold in diabetic individuals compared to those who do not have diabetes" (Preshaw, 2013, p. 9). Zainoddin, Taib, Awang, Hassan, and Alam (2013) stated "Periodontal disease has been found to be one of the contributing factors for the development of various systemic conditions such as cardiovascular disease (CVD), diabetes mellitus, adverse pregnancy outcome and also osteoporosis" (p. 363). "A systemic review by Lam et al. reported that patients presenting with periodontal disease were 1.14 to 2.2 times more likely to develop CVD" (Dahm et al., 2015). "In one study, it was found that about 40% of patients with moderate periodontal disease (n=22) and 10% of patients with chronic periodontal disease (n=65) had hypertension meanwhile about 5% of patients with moderate periodontal disease and 8% of patients with severe periodontal disease had suffered from diabetes mellitus" (Zainoddin et al., 2013, pp. 363-364). Preshaw (2013) also

noted that, “there is emerging evidence to show that successful treatment of periodontitis can lead to improved glycemic control in people with diabetes, with reductions in HbA1c of around 0.4%” (p. 9). Periodontitis and diabetes are similar in that they both are related to heightened systemic inflammation (Preshaw, 2013, p. 10). Controlling periodontitis can reduce the inflammatory load on a diabetic patient with the result of more glycemic control.

Dental health care in the United States is an elusive prospect for many, especially those with low income and minority status. “Basic oral health care is an important determinant of overall health, yet access to it remains a challenge for millions of Americans” (The National Governors Association, 2013, p.1). “The problem of accessing care is fueled by a number of factors, including lack of insurance coverage, high costs, and difficulty finding a dentist” (The Pew Charitable Trusts, 2013, p. 5). The pain associated with dental related diseases, such as caries and tooth abscesses, affects the ability of adults and children to attend and function properly at work and school. The esthetic component of poor dental health care can also impact the ability to obtain employment. Unemployed individuals rarely have dental insurance. “Individuals who have dental coverage are significantly more likely to receive dental services than individuals without such coverage; therefore, access to dental health insurance can be another important factor affecting access to basic dental services” (National Governors Association, 2013, p. 2). Occasionally, individuals who are unemployed or have low income may have the opportunity to access dental services with Medicaid paying the provider. However, “states are not required to offer dental services through Medicaid for adults, and fewer than half of states choose to cover preventative oral health care services through their Medicaid program” (National Governors Association, 2013, p. 2).

Dental disease is a preventable condition, but “approximately 25 percent of nonelderly Americans have untreated tooth decay” (National Governors Association, 2013, p. 2). The percentage of individuals in Ohio who have underserved dental needs is 8% (National Governor’s Association, 2013). The shortage of dentists and the consequences of this shortage are well documented by The Pew Charitable Trusts, (2013):

The distribution of dentists across the country is uneven. According to the U.S. Department of Health and Human Services, more than 45 million Americans live in areas-many of them rural or inner cities-identified by the federal government as having dentist shortages. Estimates suggest that more than 6,000 additional dentists would be needed to end these shortages. Compounding these problems, the American Dental Association projects that, despite the addition of dental schools, the ratio of dentists to population will shrink in the coming years. (p. 5)

In order to address the problem of citizen access to dental care, the American Dental Hygienists’ Association (ADHA) proposed, in 2004, a new category of dental health provider called the mid-level dental care provider. (American Dental Hygienists’ Association, 2010). This new provider of dental services would be required to hold a current dental hygiene license and a bachelor’s degree. In addition to the bachelor’s degree they would be required to obtain a dental therapy degree from an accredited program. This additional education would allow dental hygienists to work in underserved areas and public health settings. Their scope of practice would include treatment for basic preventative and restorative procedures without being under the direct supervision of a dentist. “The ability of dental therapists to work without a dentist on the

premises is critical to their ability to increase the availability of dental care in areas where dentists are scarce or unavailable” (Federal Trade Commission, 2013, p. 2). However, in most instances, collaboration with a dentist will be necessary. The preventative and restorative procedures that the proposed dental health provider could provide would include but not be limited to: non-surgical periodontal therapy, preparation and restoration of primary and permanent teeth, local anesthesia, oral hygiene instruction, simple, uncomplicated extractions, placement of sealants and diagnosis and treatment planning.

Statement of the Problem

“Despite their proven effectiveness in Alaska, Minnesota, and around the globe, adoption of midlevel dental providers in the United States has proceeded slowly” (The Pew Charitable Trusts, 2013, p. 8). The slow growth of this mid-level provider is due to, “most notably, the opposition of dentists, dental associations and the lack of awareness of dental hygienists” (The Pew Charitable Trust, 2013, p. 8).

Purpose of the Study

The purpose of this study was to determine the awareness and attitudes of dental hygienists in Ohio toward the mid-level dental provider model as proposed by the American Dental Hygienists’ Association (ADHA). This mid-level dental provider model could increase the number of dental professionals to help address access to care for dental needs in the underserved populations of Ohio and provide more job/career opportunities for Ohio’s dental hygienists.

Research Questions

The following questions guided this research: 1) Are registered dental hygienists in Ohio aware of the mid-level dental provider model proposed by the ADHA? 2) What are the attitudes of registered dental hygienists in Ohio regarding the mid-level dental provider proposed by the ADHA? 3) Would this be a career option registered dental hygienists in Ohio would choose?

Significance of the Study

The significance of the study was that many dental hygienists in Ohio may not have current or appropriate information regarding this new mid-level provider. The ADHA has heavily promoted the legislation that would implement this new provider. However, dental hygienists who are not members of the ADHA will probably not have accurate, if any, information about the legislation. The lack of knowledge regarding this new provider and their scope of practice should motivate dental hygienists to gain further insight into this new dental provider model. Therefore, hopefully, supporting the legislation that will allow Ohio to adopt the Dental Hygiene Therapist. Also, there are few studies that document the attitudes and awareness of dental hygienists in the U.S. regarding this new model. There is more information about dental hygienists' views of dental therapists in other areas of the world. However, the practice of dental therapy in the U.S. is relatively new with the first class of dental therapists graduating in Minnesota in 2011.

Delimitations

The study was delimited to registered dental hygienists in Ohio. To be included in the study, participants had to be registered dental hygienists in Ohio during the period of data collection (June 2016).

Limitations

Although the participants were randomly selected only a small percentage of those selected actually participated. Therefore, a limitation of this study was that it cannot be generalized to represent this population. Also, previous misinformation regarding mid-level dental providers could have biased survey results. In addition, the results were representative of only Ohio's registered dental hygienists. Another limitation was that future dental hygienists may not hold the same attitudes of the participants.

Assumptions

I assumed that all participants read and understood the survey and answered all questions honestly. I assumed that each participant responded to the survey only once and that the participants were responding in reference to the correct mid-level dental provider model i.e. the model proposed by the ADHA.

Operational Definitions

- ï *Access to care* – Improving access to comprehensive, quality health care services (U.S. Department of Health and Human Services, 2010).
- ï *American Dental Hygienists' Association (ADHA)* – The national organization that represents the professional interests of registered dental hygienists (RDHs) across the

country (ADHA, 2012).

- ï *Mid-level dental provider* – New oral health provider with the ability to provide much needed restorative and preventative dental care to underserved populations (ADHA, 2012).
- ï *Periodontal disease* –The result of an infection and inflammation of the gums and bone that surround and support the teeth. This disease usually starts as gingivitis and, without treatment, progresses to periodontitis, an inflammation of the periodontal tissues (CDC, 2015).
- ï *Preventative procedures* – Services delivered that maintain the health of the oral cavity. These procedures include proper brushing and flossing, fluoride application, dental cleanings, sealants, non-medical nutritional counseling and smoking cessation.
- ï *Restorative procedures* – Return teeth to their original form and function. This is usually accomplished through removing decay and replacing the missing tooth structure with amalgam or composite filling material. These procedures can also include crowns, bridges, and root canals.
- ï *Underserved populations* - Designated as having a shortage of primary medical care, dental or mental health providers. They may be urban or rural areas, population groups or medical groups or other public facilities (U.S. Department of Health and Human Services, 2010).

CHAPTER 2

REVIEW OF LITERATURE

Dentists

The shortage of dentists across the United States and the lack of dentists who accept public dental coverage, Medicaid, is a cause for public concern due to the inconsistency and lack of access to dental care by many Americans. “Fewer than half of all dentists participate in public dental insurance programs, and even those who do may restrict the number served” (Davis, Deinard, & Maiga, 2010, p. 205). This is a concern because an individual’s overall health is integrated with their dental health on many levels.

Oral diseases, which range from dental caries (cavities) to more widespread infections, are problematic for millions of Americans and lead to serious consequences, including complications of major chronic conditions, debilitating pain, absenteeism from work and school, nutrition issues, loss of teeth, impacts on children’s growth and social development, adverse pregnancy outcomes, inefficient use of emergency department services, and even death. (National Governors association, 2013, p. 1)

Also, dental caries is the most prevalent, chronic, preventable disease for children. “The oral health objectives in Healthy People 2020 are the guideposts for evaluating efforts to improve access to timely dental care and, ultimately, oral health status” (Jones et al., 2013, p. 489).

“Some of the most significant factors that contribute to this lack of access to care are a shortage of dentists, poor participation of dentists in public assistance programs, and dental

hygiene practice acts” (Catlett & Greenlee, 2013, p. 110). The shortage of dentists is a multifaceted problem. “The American Association of Dental Schools predicted a decline of dentists to start about 2014” (Collier, 2009, p. 253). The decline is due to the closure of dental schools such as Georgetown University in Washington, DC and Northwestern University in Evanston, Illinois. Another contributing factor to this decrease in dentists is the “retirement of the baby boomer dentists” (Collier, 2009, p. 253). Also, currently, female dental students account for approximately 50% of all dental student enrollments. “Female dentists are more likely to work fewer than 32 hours a week than male dentists” (Collier, 2009, p. 254). Therefore, the existing workforce engages in fewer hours worked which also contributes to the shortage.

“The US Department of Health and Human Services Health Resources and Services Administration (HRSA) has developed a system to monitor and designate Health Professional Shortage Areas or HPSAs” (Oral Health America, 2014, p. 8). “There are three types of dental HPSAs: geographic, population and facility” (Oral Health America, 2014, p. 8). Areas that are designated to be Dental HPSAs have an insufficient number of dentists to serve the population based on current regulations set by the HRSA (US Department of Health and Human Services, 2014). “Currently, thirty-one states (62 percent) have high rates of Dental Health Provider Shortage Areas, meeting only 40% or less of dental provider needs” (Oral Health America, 2014, p. 1). Ohio’s Dental HPSAs are located in 84 of Ohio’s 88 counties. However, Ohio’s ranking of dental needs met left it teetering between the good and fair designation. The HRSA (2013) reported the current acceptable rate to be 5000 individuals to one dentist. However, Catlett and Greenlee (2013) stated, “In 2006, the dentist-to-population ratio in the U.S. was 5.8 dentists per 10,000 residents” (p.110). Furthermore, Catlett and Greenlee (2013) found that in 2010 “there

were over 25% more dental hygienists as general dentists in the U.S.” (p. 110). As of January 2016, “There are currently 185,000+ licensed Dental Hygienists in the United States” (ADHA, 2016, p. 1). Projections from The American Dental Association indicate that the dentist to patient ratios will not improve due to the retirement of many dentists and the decrease in dental school enrollment. Estimates from the Pew Charitable Trusts, (2013), suggest that more than 6,000 additional dentists would be needed to end these shortages (p. 5).

Many dentists do not practice in the urban and rural settings where many of the individuals who lack dental care live. This is considered a geographic dental HPSA, one type of HPSA. Also “studies have shown how the prevalence of dental caries is historically higher among those who live in poverty and rural areas and in minority groups” (Catlett & Greenlee, 2013, p. 111). Rural areas and regions with large minority populations are the specific areas that dentists are reluctant to start practices in.

Public policy has attempted to address the shortages in access to dental health care by providing incentives to dentists who serves low-income populations (thereby increasing the supply of dentists in rural areas), by using medical health care services (such as fluoride varnish treatments) and by encouraging foreign dental school graduates to become licensed dentists in the U. S. These attempts have resulted in little or no success in an increase in dental care access. (Catlett & Greenlee, 2013, p. 111)

Ohio demonstrated that its dental HPSA needs were met at 30% or greater (Oral Health America, 2014). Clearly the dental needs of Ohioans, at 30%, are not being met to the full extent of the entire population. The oral health care workforce needs new visions such as the Advanced

Dental Hygiene Practitioner proposed by the American Dental Hygienists' Association. Also, a report in 2011, provided by the Institute of Medicine,

called for deploying additional dental workforce models to improve the availability of care. The institute found no safety or quality concerns and recommended more research into how midlevel providers could be used to expand access. The report concluded that improving access would require multiple solutions using an array of providers across a variety of settings. (Pew Charitable Trusts, 2013, p .6)

According to a study conducted in 2004 by The Center for Health Workforce Studies at the University of Albany, along with other previous studies, the expansion of dental hygiene professional practice acts had been shown to improve the access to and utilization of oral health care services along with oral health outcomes. (Catlett & Greenlee, 2013, p. 111)

Oral Health in America: A Report of the Surgeon General (2014) describes “a silent epidemic of oral diseases that is affecting the most vulnerable citizens including poor children, the elderly, and many members of racial and ethnic minority groups” (p. 117).

Thirteen percent of the U.S. population is considered elderly, or over the age of 65, with increases expected to reach 20% by 2030, or 92 million Americans. Data from the most recent 2010 census revealed that the older population is increasing 15% more than the overall U.S. population. (Dahm et al., 2015, p. 229)

It is of the utmost importance that the dentists that make up state dental boards relax the supervision requirement of dental hygienists and implement the new mid-level dental care provider. The dental hygiene practice act supervision requirements, dictated by state dental boards, limit the dental workforce conditions (Catlett & Greenlee, 2013, p. 110). “Under Action 4 of the National Call to Action’s report, (Increase Oral Health Workforce Diversity, Capacity, and Flexibility), there is a call for more flexibility in the licensure laws for dental professionals” (Gadbury-Amyot & Brickle, 2010, p. 110). Relaxing dental hygiene practice act supervision requirements would increase flexibility for dental hygienists.

Burden of Untreated Dental Disease

Due to the shortage of dentists and lack of dental insurance coverage, many people use emergency rooms for their urgent dental needs. Dental related treatment in emergency rooms is guaranteed to patients with insurance coverage and at no cost to the individual without insurance or the ability to pay out-of-pocket (Dollins, Bray, & Gadbury-Amyot, 2013). A study reviewed by Dollins et al. (2013) revealed “that in the five hospital system there was, in the span of 1 year, a total of 10,325 dental-related ER visits resulting in a cost of \$4,743,519 (a median cost of \$525 per visit)” (p. 275). Another study conducted in North Carolina revealed that “in 1997, there were 62,000 avoidable ER dental visits which incurred total reimbursements of \$1,686,565” (Davis et al., 2010, p. 206). Unfortunately, ER dental concerns are unable to be treated appropriately. Patients are given either antibiotics and/or pain medication and told to follow-up with a dentist. The physicians in the ERs do not have the training or facilities to treat dental pain from abscesses, decay, or broken teeth. The treatment in ERs is palliative and requires follow-up. “Potential for that follow-up with appropriately trained staff is nearly nonexistent for those without a regular dentist, commercial dental insurance, or the ability to pay out-of-pocket”

(Davis et al., 2010, p. 206). Emergency room dental care visits can be reduced by eliminating delays in treatment and promoting prevention and regular restorative treatment services by mid-level dental providers.

Mid-level Dental Care Provider

The American Dental Hygienists' Association proposed, in 2004, a dental health provider model called the Advanced Dental Hygiene Practitioner (ADHP). However, this was not a new dental health provider. Dental Therapists, synonymous with the ADHP, had been working in many countries such as Belgium, Greece, Finland, Scotland, New Zealand, Bahamas, Canada, South Africa, Thailand, Samoa, Botswana, and the United Kingdom to name just a few (Freeman, Lush, MacGillveray, Themessl-Huber, & Richards, 2013). "One study provides anecdotal evidence suggesting that 90 years ago, dental therapists in New Zealand had the ability to work independently in remote-rural areas, at least with paediatric patients" (Freeman et al., 2013, p. 106). New Zealand actually developed the first program for educating dental nurses to care for children in 1923.

Research suggests that, due to their significantly lower salaries - \$35 an hour for dental therapists, compared with \$75 per hour for dentists at one nonprofit practice in Minnesota – and given appropriate policies and payment rules, midlevel practitioners can actually benefit dental practices financially, while providing care to millions of people who live where dentists are scarce. (Pew Charitable Trusts, 2013, p. 8)

Currently in Minnesota, dental therapists are employed in dental practices where they provide treatment such as fillings, oral hygiene instruction, and simple extractions while the

dentist is free to engage in more complicated procedures. “Dental hygienists reported frustrations related to their career growth due to the trend of too many dental hygiene programs, a reduction in benefits and salaries, and a shortage of available dental hygiene positions. The dental hygiene workforce is available: therefore, it needs to be utilized” (Catlett & Greenlee, 2013, p. 110).

The basic educational infrastructure is already in place with 335 entry-level dental hygiene programs in the U. S. Also, the Commission on Dental Accreditation “authorized on August 7th, 2015 the establishment of an accreditation process for dental therapy education programs” (Solana, 2015, August, p. 1) in the U. S.

Some dental hygienists have concerns that this new dental care provider will take the place of dental hygienists. However, private practice dental hygiene jobs will not be eliminated. The new mid-level dental provider is similar to the nurse practitioner in that it will bridge the gap between the dentist and the dental hygienist. Private practice employment will continue but the dental hygienists who want to further their education and job prospects can become dental therapists thereby adding private practice positions to the underemployed.

Although many provider models may be necessary to adequately increase access to dental care, the hygienist-therapist model is aimed directly at elevating the skill of a current profession, thus allowing for an accredited education curriculum that builds upon existing knowledge rather than starting with a new, entry-level provider. (Dollins et al., 2013, p. 277)

The Kellogg Foundation (2008) conducted a two-year study of the Alaska Dental Health Aid Therapist (DHAT) that was developed by the Alaska Native Tribal Health Consortium (ANTHC) in 2000. Willard and Fauteux (2011) stated, “DHATs receive two years of post-high school training, which prepares them to provide a limited scope of dental education, prevention, and urgent and basic restorative care” (p. 27). “Use of dental health aide therapists is a long-standing approach in many countries that has been recognized around the world as a mechanism for providing care to remote regions” (Wetterhall, Burrus, Shugars, & Bader, 2011, p. 1838). The DHAT was developed because of the same factors that exist in the lower 48 states: rural living conditions of the Alaskan natives and the lack of dentists. Previously, the Division of Indian Health used the itinerant model of dental care to try to alleviate the problem of access to dental care. However, this approach would only allow for visiting dentists to arrive in rural communities once or twice a year and treat only the most urgent needs. This model did not allow for “preventative services or early restorative care” (Wetterhall et al., 2011, p. 1839).

The new dental provider, the DHAT, was educated in a 24-month long program with high school graduates from Alaska.

After completing more than 3,000 hours of training, DHATs must be directly supervised during a preceptorship lasting a minimum of 400 hours. The preceptorship can be thought of as a short residency. During this typically 6-month period, the supervising dentist acquires an intimate knowledge of the DHAT’s skills.

(Willard & Fauteux, 2011, p. 528)

These individuals have been serving remote Alaskan villages without the presence of a dentist since 2006. The services provided include: oral health and nutrition education, sealant placement, fluoride treatments, coronal polishing, prophylaxis, and radiographs, restoring primary and permanent teeth, and non-surgical extractions. This new dental provider also provides cultural sensitivity to the individuals served. The individuals trained as DHATs are usually from the regions they return to service or they have family members who live in the communities. “Formal evaluations of the DHAT practice have demonstrated that irreversible dental procedures can be safely and effectively delivered by non-dentists” (ADHA, 2010, p. 2).

The Alaskan DHAT is the initial model for the dental therapist in the U.S. and is regulated by the Community Health Aide Program (CHAP) in Alaska. However, the Commission on Dental Accreditation (CODA) has developed the core curriculum for the mid-level dental provider proposed by the ADHA.

Summary

Ohio, with its high incidence of dental health professional shortage areas, would benefit from the existence of a mid-level provider, like that of Alaska’s DHAT. This mid-level provider, rather than replacing dental hygienists would provide additional career opportunities in the dental field and could help alleviate the needs of those who have little or no access to dental care.

CHAPTER 3

DESIGN AND METHODOLOGY

Overview

The purpose of this study was to determine the awareness and attitudes of registered dental hygienists in Ohio concerning the mid-level dental provider model (ADHP) proposed by the American Dental Hygienists' Association (ADHA). This new mid-level dental provider could increase the number of dental professionals available and address access to care for dental needs in the underserved populations of Ohio; however, "dental hygiene practice act supervision requirements, dictated by state dental boards, limit the dental workforce conditions" (Catlett & Greenlee, 2013, p. 110). Dental hygienists may be the driving force as to whether or not practice acts are changed. Therefore, I designed this study to explore their awareness and attitudes regarding the ADHP. Dental hygienists' awareness and attitudes could play a pivotal role at the legislative level. Dental hygienists who are members of ADHA should have the most current and correct information regarding the new ADHA mid-level provider model.

In this quantitative cross sectional study, I collected data concerning registered Ohio dental hygienists' awareness and attitudes regarding the mid-level dental provider by using a survey. "The purpose of a survey, no matter what type of survey is being used, is to gather specific information from a targeted group of people" (Cottrell & McKenzie, 2011, p. 195). Overall, this research provided some necessary information to elevate a mid-level dental provider in Ohio which has the potential to help alleviate limited access to dental care for Ohioans. The potential mid-level dental provider who is readily available and currently needs relatively minimal training is the dental hygienist. Catlett and Greenlee (2013) found that in 2010

“there were over 25% more dental hygienists as general dentists in the U.S.” (p. 110). By using a new mid-level dental provider, care could be increased for those enrolled in public assistance programs, reduce the burden felt by emergency rooms due to dental emergencies, and delays and limited access to prevention and uncomplicated treatment services could be minimized. The overall health status of many Ohioans could potentially be improved, especially health conditions that are associated with periodontal disease such as diabetes, CVD and adverse pregnancy outcomes.

The implementation of the mid-level dental provider in Ohio could hinge on the awareness and attitudes of dental professionals, especially dental hygienists. I designed the survey to capture “data at one point in time” (Cottrell & McKenzie, 2011, p. 196) and distributed it electronically using participants extracted from a database of licensed dental hygienists in Ohio. The data collection was confidential but not anonymous.

Population

The population for the research study was determined by simple inclusion and exclusion criteria. The population I selected for the study was all dental hygienists who were licensed in Ohio ($N=4100$). I took a simple random sample of 400 of the 4100 dental hygienists in Ohio with a systematic approach, a random start and selection of subjects at a constant interval using a list distributed by the Ohio Dental Hygienists’ Association of all hygienists licensed in Ohio. “If the sampling and data collection are done properly, the precision of the data collected from a sample can very closely approximate that of a census” (Cottrell & McKenzie, 201, p. 126).

Survey Instrument Development

I designed the survey as a cross-sectional instrument to measure quantitative data with predetermined questions (Appendix A). The purpose of the survey was to measure respondent's awareness and attitudes towards the mid-level dental provider in Ohio. The structured format required the respondents to choose from answers that were provided. The questions were also structured to gather the demographic variables of age, gender, Ohio area of residence, and ADHA membership. I requested this information to determine if these variables affected awareness and attitude towards the mid-level dental provider. I designed the survey to take approximately three to five minutes to complete.

Institutional Board Review

The research participants in this study were voluntary participants who chose "freely to subject themselves to the scrutiny inherent in research" (Cottrell & Mc Kenzie, 2011, p.101). I followed the East Tennessee State University (ETSU) Institutional Board Review (IRB) checklist (Appendix B) and submitted an application for review of the research protocol. I submitted a form for an expedited review due to the circumstances that "the risk to the participant is minimal" (Cottrell & Mc Kenzie, 2011, p.104). The collection of some personal data from the respondents resulted in confidentiality but not anonymity. I received approval for the study from ETSU IRB on May 31, 2016, with approval number c0516.21e.

Pilot Study

I distributed the initial survey (Appendix C) to all 12 dental hygiene faculty working in the Dental Hygiene Department at the University of Cincinnati as a pilot study to determine the validity and reliability of the measurement instrument. The faculty had a week to respond to the survey and include their evaluation and suggestions. All faculty members responded within two

days with multiple suggestions for improvement of the survey. I incorporated the changes into the survey instrument (Appendix A).

Informed Consent

I included a disclosure of relevant information including the purpose of the research, possible risks, and possible benefits (Appendix D) with the electronic survey. “The individual must have sufficient knowledge and understanding of the nature of the proposed research, the anticipated risks and potential benefits, and requirements of the research to be able to make an informed decision” (Levine, 1988, as stated in NIH, 2000). The consent for the electronic survey was implied by the statement attached to the email that stated “Your consent to participate in this study is implied by your decision to link to the website and complete and submit the questionnaire” (Cottrell & McKenzie, 2011, p. 109).

Data Collection Procedures

The method of data collection was electronic surveys. I selected the sample using a simple random probability sampling method in June, 2016. The participants had only one option to provide data, the use of a link to the survey on Survey Monkey. Participants provided implied consent by choosing to complete the survey. I delivered the link to the survey via email on June 5, 2016. Those in the sample had only their email addresses compiled in a contact list within Survey Monkey software. The email also included Informed Consent Letter (Appendix D) and an invitation to complete the survey. After the survey was open for one week, I sent a reminder email to all participants who had not responded to the survey.

I closed the survey was closed on June 24, 2016. Fifty-four dental hygienists responded to the survey. After the close of the survey, I sent a thank email to all dental hygienists who participated in the research.

Research Questions

Cottrell and Mc Kenzie (2011) stated, “Research questions are interrogative sentences that clearly and succinctly state the major question or questions to be answered in the study” (p. 82).

The three research questions addressed by this research were:

1. Are registered dental hygienists in Ohio aware of the mid-level dental provider model proposed by the American Dental Hygienists’ Association?
2. What are the attitudes of registered dental hygienists in Ohio regarding the mid-level dental provider proposed by the ADHA?
3. Would this be a career option dental hygienists in Ohio would choose?

The first research question of the awareness of Ohio dental hygienists of the mid-level provider was answered by survey question #4.

The second research question of the attitudes of Ohio’s dental hygienists towards this new model was answered by survey questions #5 & #6 with whether or not they support the mid-level provider.

The third research question of pursuing the actual career of the mid-level provider was answered by the response to survey question #7, of whether or not this would be a personal career/educational option for the survey participants.

Data Analysis Procedures

I created frequency distributions of awareness, attitude, and the career option of the mid-level dental provider to reveal the distribution of the participant’s responses. I also used frequency distributions to display the demographics of the respondents and summarize the data.

CHAPTER 4
ANALYSIS OF DATA

Overview

The purpose of this study was to determine the awareness and attitudes of registered dental hygienists in Ohio towards the mid-level dental provider (ADHP) model proposed by the ADHA. The dental hygienist is the most effective and readily available resource of health care professionals to educate for this new profession. According to the CODA Standards for Dental Therapy, adopted in August of 2015, minimal education would be necessary to educate dental hygienists to a level that would allow them to provide safe and effective dental care for the underserved. As of January 2016, “There are currently 185,000+ licensed dental hygienists in the United States” (ADHA, 2016, p. 1). This mid-level dental provider model could increase the number of dental professionals available to address access to care for dental needs in the underserved populations of Ohio. Ohio demonstrated that its Dental HPSA unmet needs were 30% or greater (Oral Health America, 2013). There are underserved dental needs in Ohio that result from the uneven distribution of dentists across the country. Currently, 84 of Ohio’s 88 counties are considered dental health professional shortage areas. “According to the U.S. Department of Health and Human Services, more than 45 million Americans live in areas-many of them rural or inner cities-identified by the federal government as having dentist shortages” (The Pew Charitable Trust, 2013, p. 5). Since dental hygienists must work under the supervision of dentists, the distribution of dentists is a surrogate measure of the distribution of dental hygienists.

Dental hygienists may be the driving force as to whether or not practice acts are

modified to facilitate the implementation of this new provider. The slow growth of this mid-level provider is due to, “most notably, the opposition of dentists, dental associations and the lack of awareness of dental hygienists” (The Pew Charitable Trust, 2013, p. 8).

Participants

The participants in the study were licensed dental hygienists in Ohio. The study’s sample size was 400 of the 4100 Ohio dental hygienists. Fifty-four dental hygienists (13% of the sample) participated in the study. All participants who responded were female. The age range of the participants was 20 to 79+ years old. The age category of participants who answered the survey most frequently was 50-59 years-old. Of those responding, 48 (92.59%) were members of the ADHA. The largest proportion, 15 (29.63%), of participants had been in practice as dental hygienists for 26-30+ years. A summary of the participants’ demographics is presented in Table 1.

Table 1

Summary of Demographic Characteristics of the Sample of Dental Hygienists (n = 54)

<u>Variable</u>	<u>Frequency (n)</u>	<u>Percent</u>
Gender		
1. Male	0	0
2. Female	100	100
3. Transgender	0	0
Age		
1. 20-24	2	3.70
2. 25-29	4	7.41
3. 30-39	11	20.37
4. 40-49	9	16.67
5. 50-59	17	31.48
6. 60-69	10	18.52
7. 70-79+	1	1.85

Table 1. (continued)

Variable	Frequency (<i>n</i>)	Percent
Membership in the American Dental Hygienists' Association		
1. Yes	50	92.59
2. No	4	7.41
Years practicing dental hygiene		
1. 0-5	9	16.67
2. 6-10	8	14.81
3. 11-15	5	9.26
4. 16-20	8	14.81
5. 21-25	8	14.81
6. 26-30 + years	16	29.63
Regions of residence in Ohio		
1. Northwest	7	12.96
2. Northeast	16	29.63
3. Central	7	12.96
4. Southwest	21	38.89
5. Southeast	3	5.56

Results

Research question #1- Are registered dental hygienists in Ohio aware of the mid-level dental provider model proposed by the American Dental Hygienists' Association? The majority of licensed dental hygienists who participated in the survey, (88.89%), were aware of the new mid-level dental care provider; only 3.7% of the respondents had no knowledge of the new provider and 7.41% were unsure if they were aware of the new provider.

Research question #2- What are the attitudes of registered dental hygienists in Ohio regarding the mid-level dental provider proposed by the ADHA? Respondents strongly agreed (52.83%) that legislation should be enacted to allow Ohio dental hygienists to become mid-level

dental providers. More than a quarter of respondents, (28.30%), agreed that legislation enabling the new provider role should be adopted. The remaining 16.98% had neutral opinions. No participant disagreed with enacting legislation enabling the new model, however, 1.89% strongly disagreed with this legislation. One participant failed to respond to this survey question.

Research question # 3- Would this be a career option dental hygienists in Ohio would choose? Just under one third (30.77%) strongly agreed that they would chose the mid-level dental care provider as a career choice. Over one third (36.54%) agreed that this new provider model would be a career choice. Nineteen percent (19.23%) of respondents were neutral regarding choosing this as a career, 9.62% of respondents disagreed that this would be a career choice for them, and 3.85% strongly disagreed that this would be a viable career option for them. Two participants did not answer this survey question.

Discussion

Based on the results of this research, most dental hygienists who participated in the survey were aware of the new mid-level dental care provided proposed by the American Dental Hygienists' Association. A small percentage had not heard of the new provider and only slightly more dental hygienists were unsure if they actually understood and identified the correct mid-level dental care provider.

More than half of the participants strongly agreed that adopting the legislation for the new mid-level dental provider would benefit overall access to dental care in Ohio. Also, many dental hygienists somewhat agreed that Ohio is in need of an alternative provider to deliver dental care to underserved Ohioans. A small proportion expressed a neutral opinion about implementing new providers for delivering dental care. Only one dental hygienist strongly

disagreed that a new dental provider model adoption be the answer for access to dental in Ohio. One participant skipped this question.

Many participants were, as with their attitudes regarding the provider, neutral about changing their career to practice as an ADHP. About the same number of participants indicated that they would not consider changing careers for the ADHP.

CHAPTER 5

CONCLUSIONS, DISCUSSIONS, AND RECOMMENDATIONS

Introduction

Good oral health improves a person’s ability to speak, smile, smell, taste, touch, chew, swallow, and make facial expressions to show feelings and emotions. Many of the most common diseases in the United States, including diabetes and cardiovascular disease, are linked to dental diseases such as gingivitis and periodontitis. The resources for many Ohioans to achieve dental health, one component of optimal overall health, are elusive or nonexistent, especially for low income and minority individuals. Dental disease is a preventable condition, however, “approximately 25 percent of nonelderly Americans have untreated tooth decay” (National Governors Association, 2013, p. 2). Also, dental caries is the most prevalent, chronic, preventable disease in children. Children affected by dental caries experience pain, growth and development problems due to the inability to eat properly and absenteeism from school. “Oral diseases, from cavities to oral cancer, cause pain and disability for many Americans” (U. S. Department of Health and Human Services, 2014, p. 1).

Ohio is considered one of many states that has a high percentage of Dental HPSAs. Ohio’s Dental HPSAs are located in 84 of Ohio’s 88 counties. The dental health professionals in short supply are dentists. Many dentists chose not to practice in urban or rural areas where more than 45 million Americans live (The Pew Charitable Trust, 2013, p. 5). Also, many dentists don’t accept or limit patients who participate in public dental insurance programs such as Medicaid. “Fewer than half of all dentists participate in public dental insurance programs, and even those who do may restrict the number served” (Davis et al., 2010, p. 205). Also, projections from The American Dental Association state that the dentist to patient ratios will not

improve due to the retirement of many dentists and the decrease in dental school enrollment. Estimates from the Pew Charitable Trusts (2013) indicate that more than 6,000 additional dentists would be needed to end these shortages (p. 5).

Another factor that limits the access to dental care, especially prevention, is the state practice acts for dental hygienists. Dental hygienists are trained predominantly in the prevention of dental disease. Therefore, in 2004, the ADHA proposed a new category of dental health provider, the Advanced Dental Hygiene Practitioner. (American Dental Hygienists' Association, 2010). The preventative and restorative procedures that the proposed dental health provider could provide would include but not be limited to: non-surgical periodontal therapy, preparation and restoration of primary and permanent teeth, local anesthesia, oral hygiene instruction, simple, uncomplicated extractions, placement of sealants, fluoride treatments, and diagnosis and treatment planning. "Despite their proven effectiveness in Alaska, Minnesota, and around the globe, adoption of midlevel dental providers in the United States has proceeded slowly" (The Pew Charitable Trusts, 2013, p. 8). This mid-level dental provider model could increase the number of dental professionals, help address access to care for dental needs in the underserved populations of Ohio and provide more job/career opportunities for Ohio's dental hygienists.

Conclusions

Based on the results of this research, the majority of dental hygienists who participated in the survey were aware of the new mid-level dental care provided proposed by the American Dental Hygienists' Association. I believe this awareness is due to greater than 92% of respondents were members of the ADHA and the ADHA's campaign to adopt the ADHP nationwide. A minimal percentage had not heard of the new provider and only slightly more

dental hygienists were unsure if they actually understood and identified the correct mid-level dental care provider.

More than half of the participants strongly agreed that adopting the legislation for the new mid-level dental provider would benefit overall access to dental care in Ohio. Greater than 68% of respondents live in areas of Dental HPSAs, the northeast and southwest areas of Ohio. This would attribute to their knowledge of the lack of access to dental care. Also, many dental hygienists somewhat agreed that Ohio is in need of an alternative provider to deliver dental care to underserved Ohioans. A minimal proportion had a neutral opinion about implementing new providers for delivering dental care. Only one dental hygienist strongly disagreed that a new dental provider model adoption would not be the answer for access to dental in Ohio.

Implementing educational opportunities for dental hygienists to train for the Advanced Dental Hygiene Practitioner was met with strong agreement or agreement from two thirds of the participants. I believe the agreement among dental hygienists to implement new educational opportunities for the ADHP stems from the long-term need for more job opportunities, both full and part-time and within different venues. Many participants were, as with their attitudes regarding the provider, neutral about pursuing this type of education or changing their career to practice as an ADHP. About the same number of participants did not feel that changing careers or pursuing additional education for the ADHP would be something they would consider. The data does reveal that most of the participants fall within the age bracket of 50-59 years old, which could explain the lack of interest in starting a new career.

Discussion

Given that dental hygienists will be the driving force as to whether or not the mid-level dental provider is implemented in Ohio, their awareness and attitudes with regard to the ADHP is

paramount. Dental hygienists' awareness and attitudes could play a pivotal role at the legislative level. It is likely that dental hygienists who are members of the ADHA are more in-tune with this new mid-level dental provider. Along with correct information comes the ability to form an appropriate opinion and attitude about this issue.

Membership within the ADHA is consistently low with dental hygienists. Currently, Ohio's membership is approximately 10%. Participants who responded to the survey were almost unanimously members of the ADHA. Only 13% of dental hygienists responded to the survey. The low response rate was not unexpected. Future studies will need a much larger sample in order to achieve generalizable results. With such a low response rate, the study has a low degree of generalizability for Ohio's dental hygienists.

The low response rate could be attributed to a number of things. Dental hygienists in Ohio generally do not participate in any type of professional governance. My belief is that after the intense hygiene training most graduates, especially the younger hygienists, want to enter the job market and resume their lives. They are at an age where marriage and children are first and foremost on their agenda. Also, not having ADHA membership limits a dental hygienist's link to current issues and topics, such as the ADHP, related to our profession. However, the costly fee of a membership could be a deterrent to joining the ADHA for many hygienists. The low response rate could also be linked to technology. This was a survey conducted entirely online. It could be possible that many of the dental hygienists surveyed do not check their email on a consistent basis or their email could be incorrect on the constituent roster. A survey distributed during continuing education events, annual dental hygiene meetings, or a bulk mailing to dental offices or from the contact list would likely have generated more responses.

Although attitudes varied more on the adoption of legislation for the new provider than awareness. Ohio dental hygienists in this study strongly support adopting the mid-level dental provider. Dental hygienists, in general, typically understand the lack of dental care within their communities and the cost of dental care to a patient without dental insurance. The small percentage of neutral and disagreeing opinions could have resulted from misinformation about the scope of practice of the provider, fear of lack of anonymity, supporting a new provider in the dental community, or just an aversion to change in general. The topic of the ADHP is likely widely discussed by most dentists due to their high membership rates (73%) within the dental society in Ohio. Dental hygienists supporting this provider and expressing a positive attitude towards it could have the perception that their employers, dentists, may not agree.

Choosing to make a career change to become an ADHP received more variation within the responses. Over half of the dental hygienists who responded to the survey were 50 years old or older. This demographic is not inclined to change careers at this point in their lives. However, those who did respond felt strongly the career of an ADHP was a solid and viable option. Many young student hygienists have expressed to me robust support for the ADHP as a career option. Many dental hygienists remained neutral with their opinion about a career as an ADHP as with their attitude about the new profession. This neutrality could be due to the same influences mentioned in relation to their attitudes about this provider. The question of the ADHP as a career option response had the most disagreement among hygienists of all the survey questions. As mentioned above, dental hygienists know of the lack of access to dental care in Ohio. However, the results alluded to the fact that attitudes are positive for implementing this provider but, dental hygienists, in this survey, responded that they may not be the most appropriate candidate to fill the need.

The implication of this study is three-fold. It confirms my belief that a core group of dental hygienists, members of the ADHA, in Ohio are making career choices and practice decisions for the larger population of Ohio's dental hygienists. As a member of the Legislative Counsel for the Ohio Dental Hygienists' Association, I know that only 11% of dental hygienists in Ohio are members of the ADHA. The second value is that I have learned there are dental hygienists who are aware of the new mid-level provider and they support the legislation. The third is that the effort put forth by the core group of hygienists to get the information regarding the mid-level dental provider to all Ohio dental hygienists is moving forward.

Recommendations

The ADHP is in its infancy in the U.S. Alaska, using DHATs, and Minnesota, using ADHPs, are currently the only states at the time of this writing using a mid-level provider to their fullest capacity. Much more in depth research will need to be conducted on this provider. A qualitative study would generate more information on the attitudes and opinions of hygienists on the ADHP. Additional areas of study should include implementation; efficiency; acceptance by patients, dentists, dental hygienists, and health professions; productivity; and safety to name a few. Also, future studies could address the impact of the dental therapist on Ohio's health care system, whether there has been a reduction in the number of patients seeking dental care in emergency rooms, and how many new dental patients have been seen since the implementation of this new provider. In the future, research options will be limitless.

REFERENCES

- American Dental Hygienists' Association. (2010). *Oral health care workforce – current and proposed providers*. Retrieved on 1-30-2014 from http://wsdha.com/clientuploads/pdfs/ADHA%20pdf/ADHA%20Oral_Health_Workforce_Current_and_Proposed_Models%20copy%201.pdf
- American Dental Hygienists' Association. (2016). *The benefits of dental hygiene-based oral health providers*. Retrieved on 1-30-2016 from https://www.adha.org/resources-docs/75112_Hygiene_Based_Workforce_Models.pdf
- Catlett, A. V. & Greenlee, R. (2013). A retrospective comparison of dental hygiene supervision changes from 2001 to 2011. *The Journal of Dental Hygiene*, 87(3), 110-117.
- Center for Disease Control and Prevention. (2015, March). *Periodontal disease*. Retrieved on 3-8-2016 from http://www.cdc.gov/OralHealth/periodontal_disease/index.htm
- Collier, R. (2009). United States faces a dentist shortage. *Canadian Medical Association Journal*, 181(11), 253-254.
- Cottrell, R. R. & McKenzie, J. F. (2011). *Health promotion & education research methods*. Sudbury, MA: Jones and Bartlett.
- Dahm, T. S., Bruhn, A., & LeMaster, M. (2015). Oral care in the long-term care of older patients: How can the dental hygienist meet the need? *The Journal of Dental Hygiene*, 89(4), 229-237.
- Davis, E. E., Deinard, A. S., & Maiga, E. W. H. (2010). Doctor, my tooth hurts: The cost of incomplete dental care in the emergency room. *Journal of Public Health Dentistry*, 70(2010), 205-210. doi:10.1111/j.1752-7325.2010.00166.x

- Dollins, H. E., Bray, K. K., & Gadbury-Amyot, C. C. (2013). A qualitative case study of the legislative process of the hygienist-therapist bill in a large midwestern state. *The Journal of Dental Hygiene*, 87(5), 275-288.
- Dunker, A., Krofah, E., & Isasi, F. (2014). *The role of dental hygienists in providing access to oral health care* (National Governors Association Paper). Retrieved 2-4-2014 from <http://www.nga.org/files/live/sites/NGA/files/pdf/2014/1401DentalHealthCare.pdf>
- Gadbury-Amyot, C. C. & Brickle, C. M. (2010). Legislative initiatives of the developing advanced dental hygiene practitioner. *The Journal of Dental Hygiene*, 84(3), 110-113.
- Federal Trade Commission's Office of Planning, Bureau of Economics, and Bureau of Competition. (2013, December 2). [Letter to Sherin Took, Director, Commission on Dental Accreditation]. Retrieved on 2-4-2014 from <https://www.ftc.gov/policy/policy-actions/advocacy-filings/2013/12/ftc-staff-comment-commission-dental-accreditation>
- Freeman, R., Lush, C., MacGillveray, S., Themessl-Huber, M., & Richards, D. (2013). Dental therapist/hygienists working in remote-rural primary care: a structured review of effectiveness, efficiency, sustainability, acceptability and affordability. *International Dental Journal* 63, 103-112.
- Jones, E., Shi, L., Hayashi, A. S., Sharma, R., Daly, C., & Ngo-Metzger, Q. (2013). Access to oral health care: The role of federally qualified health centers in addressing disparities and expanding access. *American Journal of Public Health*, 103(3), 488-493.
- Mc Minn, J. V. (2012). *Paralleling Mid-Level Healthcare Providers: Can the ADHP Overcome Traditional Roadblocks to Achieve Success* (Master's thesis). UMI Number: 1534630

- Nash, D. A., Friedman, J. W., Mathu-Muju, K. R., Robinson, P. G., Satur, J., Moffat, S., ...
Fernando, E. (2013). A review of the global literature on dental therapists. *Community Dentistry and Oral Epidemiology*, 40, 1-10. doi: 10.1111/cdoe.12052
- Oral Health America. (2014). *A state of decay: Are older Americans coming of age without oral healthcare*. Retrieved on 1-2-2016
from http://b.3cdn.net/teeth/1a112ba122b6192a9d_1dm6bks67.pdf
- Preshaw, P. M. (2013). Diabetes and periodontitis: What's it all about? *Practical Diabetes*, 30(1), 9-11.
- The Pew Charitable Trusts. (2013). *Growing the dental workforce: The critical role of community colleges and workforce investments boards*. Retrieved on 2-28-2014
from <http://www.pewstates.org/dental>.
- Solana, K. (2015, August). ADA news: CODA votes to establish accreditation process for dental therapy education. *American Dental Association News Archive*. Retrieved on 2-21-2016
from <http://www.ada.org/en/publications/ada-news/2015-archive/august/coda-votes-to-establish-accreditation-process-for-dental-therapy-education>
- U. S. Department of Health and Human Services. (2010). *Access to Health Services*. Retrieved on 3-26-2014 from <http://www.healthypeople.gov/2020/topics-objectives/topic/Access-to-Health-Services>
- U. S. Department of Health and Human Services. (2014). *Oral Health*. Retrieved on 3-16-2016
from <https://www.healthypeople.gov/2020/topics-objectives/topic/oral-health>
- Willard, M. E., & Fauteux, N. (2011). Dentists provide effective supervision of Alaska's dental health aide therapists in a variety of settings. *Journal of Public Health Dentistry*, 71 27-33. <http://dx.doi.org.iris.etsu.edu:2048/10.1111/j.1752-7325.2011.00266.x>

Wetterhall, S., Burrus, B., Shugars, D., & Bader, J. (2011). Cultural context in the effort to improve oral health among Alaska native people: The dental health aide therapist model.

American Journal of Public Health, 101(10), 1836-1840.

Zainoddin, N. M. M., Taib, H., Awang, A. R., Hassan, A., & Alam, M. K. (2013). Systemic conditions in patients with periodontal disease. *International Medical Journal, 20*(3), 363-366.

APPENDICES

Appendix A

Revised Survey – Mid-Level Dental Provider

1. Are you currently working as a dental hygienist?

- Yes
- No

2. If you are not working as a dental hygienist, please explain why.

3. If not working as a dental hygienist, what type of job are you currently holding?

4. Are you aware of the mid-level dental provider proposed by the American Dental Hygienists' Association?

- Yes
- No
- Unsure

5. What is your attitude towards adopting legislation for the mid-level dental provider in Ohio?

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

6. Legislation should be enacted to allow Ohio dental hygienists to become mid-level dental providers.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

7. Is the mid-level dental provider a career option you would consider?

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

8. What is your opinion of the mid-level dental provider?

9. What is your age?

- 20 - 24
- 25 – 29
- 30 – 39
- 40 – 49
- 50 – 59
- 60 – 69
- 70 – 79+

10. What is your gender?

- Male
- Female
- Transgender

11. Are you a member of ADHA?

- Yes
- No

12. How many years have you been in practice?

- 0 – 5

- 6 – 10**
- 11 – 15**
- 16 – 20**
- 21 – 25**
- 30 + years**

13. What region of Ohio do you live in?

- Northwest**
- Northeast**
- Central**
- Southwest**
- Southeast**

Appendix B

Institutional Board Review Checklist

New protocol submission xform received

Signature of Dept. Chair/Faculty Advisor Present

No Conflict of Interest or if COI, plan present

IRB Coordinator Review for Completeness

Send for Chair Review

Receive Chair Review

Verify Education

Notify Board of Exempt Review

Notify PI (or VA R&D) of final approval

Appendix C

Pilot Survey – Mid-level Dental Provider

1. What is your age?

- 20 - 24
- 25 – 29
- 30 – 39
- 40 – 49
- 50 – 59
- 60 – 69
- 70 – 79
- 80+

2. What is your gender?

- Male
- Female

3. Are you a member of ADHA?

- Yes
- No

4. How many years have you been in practice?

- 0 – 5
- 6 – 10
- 11 – 15
- 16 – 20

21 – 25

- 30 + years

5. Are you currently working as a dental hygienist?

- Yes
- No

6. Why are you not working as a dental hygienist?

7. If not working as a dental hygienist, what type of job are you currently doing?

8. Are you aware of the mid-level dental provider proposed by the American Dental Hygienists' Association?

- Yes
- No

9. What is your attitude towards the mid-level dental provider?

- For
- Against

- Unsure

10. Would you support legislative efforts to allow dental hygienists to become mid-level providers as proposed by the ADHA?

- Yes
- No
- Unsure

11. Is the Mid-level dental provider a career option you would consider?

- Yes
- No
- Unsure

12. Additional Comments:

Appendix D

Informed Consent

Dear Participant:

My name is Cindy Leverich, and I am a graduate student at East Tennessee State University. I am working on my master's degree in Allied Health. In order to finish my studies, I need to complete a research project. The name of my research study is: Mid-level Dental Care Provider: Awareness and Attitudes of Ohio's Dental Hygienists.

The purpose of this study is to determine the attitudes & awareness of Ohio dental hygienists regarding the new mid-level provider model proposed by the American Dental Hygienists Association. I would like to give a brief online survey to dental hygienists living in Ohio using Survey Monkey. It should only take about 3 to 5 minutes to complete. You will be asked questions about your opinions and attitudes regarding this new dental provider model. Since this project deals with personal opinions, it might cause some minor stress. This study may provide benefit by providing more information about this mid-level dental provider that could increase the number of dental professionals and help address access to dental needs in the underserved populations of Ohio.

Your confidentiality will be maintained to the degree permitted by the technology used. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties, as is the case with emails. In other words, we will make every effort to ensure that your name is not connected with your responses. Specifically, Survey Monkey has security features that will be enabled: IP addresses will not be collected and SSL encryption software will be utilized. Although your rights and privacy will be maintained, the ETSU IRB (for non-medical research) and personnel particular to this research, ETSU department of graduate Allied Health studies have access to the study records.

If you do not want to fill out the survey, it will not affect you in any way. You may skip any questions you do not wish to answer or simply exit the online survey form if you wish to remove yourself entirely.

Participation in this study is voluntary. Also, your consent to participate in this study was implied by your decision to link to the website and complete and submit the survey. You may refuse to participate. You may quit at any time. If you quit or refuse to participate, the benefits or treatment to which you are otherwise entitled will not be affected.

If you have any research-related questions or problems, you may contact me, Cindy Leverich, at (937)-371-5946. I am working on this project under the supervision of Dr. Debbie Dotson. You may reach her at (423)-439-7888. Also, the chairperson of the Institutional Review Board at East Tennessee State University is available at (423) 439-6054 if you have questions about your rights as a research subject. If you have any questions or concerns about the research and want to talk to someone independent of the research team or you can't reach the study staff, you may call an IRB Coordinator at 423/439-6055 or 423/439/6002.

Sincerely,
Cindy Leverich

VITA

CYNTHIA S. LEVERICH

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