REGISTERED DENTAL HYGIENISTS' PERCEIVED PREPAREDNESS ON TREATING THE SPECIAL NEEDS PATIENT

A Thesis

by

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ABSTRACT

The purpose of this study was to examine dental hygienists' perceived preparedness when treating special needs patients and how it relates to their dental hygiene education. Paper surveys were mailed out to 1036 registered dental hygienists in Alabama, Florida, Tennessee and Texas with a return rate of 17.5% (n=181). Results of the survey show approximately 69% of respondents indicated that they felt their education somewhat prepared them or did not prepare them to treat patients with special needs. Furthermore, respondents indicated that their clinical training on patients with special needs was more beneficial than their didactic in improving their confidence and comfort when working with this population. Results of this study also show that there was a significant relationship (p=0.003) between the time spent on the subject of special needs patients during the dental hygienists' education and their perception of how well their dental hygiene education prepared them to treat patients with special needs. Additionally, this study as well as previous studies suggest that many dental professionals agree there should be more education on the special needs patient. The inclusion of such a course may increase the dental professionals comfort level and in turn, increase the willingness of practioners to treat special needs patients in their dental practice.

DEDICATION

This thesis is dedicated to my husband, Chase, my son, Truman, and my daughter, Georgia. Without whom, the support and motivation to complete this research would have been non-existent.

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Contributors

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NOMENCLATURE

ADA	American Dental Association
CODA	Commission on Dental Accreditation
DH	Dental Hygiene
ELT	Experiential Learning Theory
IRB	Institutional Review Board
SNP	Special Needs Patients
U.S.	United States

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CHAPTER I

INTRODUCTION AND LITERATURE REVIEW

According to the 2010 United States (U.S.) Census bureau report, approximately 56.7 million people of the civilian non-institutionalized population had at least one disability and 38.3 million had a severe disability.[1] These numbers have increased since the 2000 U.S. Census bureau report which reported that 51.2 million people had a disability and 32.5 million had a severe disability.[2] The rise in these statistics show there is a potential for a greater need for health care among this population.

Dental care is the most prevalent unmet need among the special needs population.[3, 4] Persons with special needs often have more complex dental needs that may be related to underlying systemic conditions or acquired anomalies.[5] Studies have found that dentists are reluctant to provide dental care to patients with special needs.[6-9] One reason dental practitioners do not treat these individuals is because they feel their education did not prepare them to work with this population.[6-9]

Education for the dental professional in the area of treating special needs patients has been a concern for more than 50 years.[10-19] In the early 1970s, a high percentage of persons with "handicaps" received inadequate dental care and one of the most prevalent barriers was inadequate training for the dental professional.[11, 12] Since then, efforts have been made to improve dental and dental hygiene education concerning the treatment of special needs patients.[14,15, 19-24]

In 1993, a survey of Canadian and U.S. dental schools found that the average number of didactic instruction was 12.9 hours and clinical instruction was 17.5 hours for the management of special needs patients.[16] A follow-up study by Romer et al. in 1999 found that 53% (n=24) of dental schools reported they had less than five hours of didactic training and 73% (n=37) of the schools clinical instruction consisted of 5% or less of a student's time.[17] Additionally, a 1994 study of dental hygiene programs found that 48% of 170 programs had ten or less hours of didactic training.[18]

The Commission on Dental Accreditation (CODA) established a standard curriculum for the dentist and dental hygienist that required clinical experience with a person who is "handicapped" or medically compromised until the mid-1990s, when that standard was removed.[20] In 2004, CODA reintroduced a standard that requires dental/dental hygiene programs to include curriculum on the special needs patient.[21] However, there was no specific standard stating the education has to be more than didactic, only that the student demonstrates competency in assessing and treatment planning for the patient.[21]

Literature Review

Very few studies have been conducted that assess dental hygienists' perceived preparedness in treating patients with special health care needs. Johnson surveyed 109 practicing dental hygienists regarding comfort and confidence levels when treating patients with special needs.[25] The respondents were asked to rate their comfort level using a five-point Likert scale when treating various types of disabilities. Johnson found that dental hygienists were moderately to always comfortable treating patients who were

wheelchair-bound, sensory impaired, patients with limited dexterity, intellectually disabled and patients who were severely medically compromised. In addition, respondents reported they were occasionally comfortable treating patients with cerebral palsy, mental illness and dementia. Approximately 42% of respondents also reported limited training as a barrier to treating patients with special needs. Furthermore, 58% (n=19) of the surveys returned with anecdotal comments stated there was a need for additional education regarding communication and care planning for special needs patients.[25]

In 2007 Keselyak et al. completed a study at the University of Missouri-Kansas City that explored adding a service learning course to the dental hygiene program for students in their fourth year of the program.[22] According to Bringle et al., "service-learning is a course-based, credit-bearing educational experience that allows students to participate in an organized service activity that meets identified community needs and to reflect on the service activity in such a way as to gain further understanding of course content and a broader appreciation of the discipline and an enhanced sense of civic responsibility."[26] Keselyak et al. asked twenty-three students to write about their experiences in a self-reflection journal after providing preventative health care services to patients with special needs. The results of the study suggest that service learning can facilitate a deeper understanding of special needs patients as well as allow students to become more aware of complex social and professional issues associated with this population.[22]

A 2008 study by Dehaitem et al. identified the need for additional research on the subject of education of the dental hygienist regarding the treatment of special needs patient.[24] The purpose of this study was to investigate how dental hygiene schools educated their students on treating patients with special needs. Surveys were sent to 240 dental hygiene program directors in the U.S. They found that the majority (98%, n=100) of dental hygiene programs included special needs patients as part of the didactic curriculum, but only 42% (n=43) contained a clinical component. Dehaitem et al. proposed a need for consideration of developing curricular resources on a national level to support dental hygiene programs in their teaching efforts regarding the special needs patient. The authors also suggest there is a need for additional information on this subject in some dental hygiene programs as most research available was regarding the dentist or dental student.[24]

In 2018, Jones and Miller's study at the University of Michigan assessed the attitudes of dental hygiene students towards persons with disabilities before and after viewing an educational module.[27] The educational module was a DVD featuring an authentic representation of disabled individuals. One hundred sixty-five dental hygiene students from both a two year and a four-year dental hygiene program completed the study over a five-year period of time. Each class was given a pre and post test to determine the students' attitudes and comfort toward treating patients with disabilities after watching the educational module. Jones and Miller concluded that the educational module improved the student's attitudes towards persons with disabilities. Additionally,

students that mentioned having sympathy towards these persons due to lack of understanding, stated this changed to empathy after the modules.[27]

There is limited research available on education of dental hygienists and how it pertains to their perceived preparedness when treating special needs patients. However, in lieu of this specific research, we can reference studies regarding dental students and dental programs with a reasonable expectation that their attitudes will be comparable to those of dental hygienists' because they are in the same industry, and the CODA standard is the same for both dental and dental hygiene programs on what needs to be included in the curriculum.[21]

A study conducted in 2018 by Byrappagari et al. examined general dentists' attitudes and perceived barriers pertaining to special needs patients.[6] One thousand two hundred fifty surveys were mailed to general dentists with active licenses. The majority of dentists (80.3%, n=224) stated they treated patients with developmental disabilities. For respondents who specified they did not treat these patients, 52.4% (n=146) identified inadequate training and clinical experiences as the reasons for not providing care to individuals with developmental disabilities.[4] The majority of dentists (73.3%; n=204) indicated dental school did not prepare them well for treating patients with special needs and agreed more training needs to be included in the curriculum (79.3%; n=221).[6]

Kuthy et al. surveyed 690 University of Iowa senior dental students (from 1992-2004) willingness to treat vulnerable special needs patients.[28] The students were surveyed prior to an extramural course treating patients in vulnerable populations including patients who were physically and mentally handicapped, drug users, frail

elderly, complex medical issues and those who had language and economic barriers. They asked students to indicate their previous experience with this population, rate their comfort treating these patients and their future willingness to treat them. Kuthy et al. found that there was a positive relationship between a practitioner's willingness to treat patients with special needs and their having prior experience with this patient population. Additionally, they determined that males were more comfortable than females when treating frail elderly, medically complex, mentally compromised, drug users, jail inmates, and non-English speaking patients.[28]

One method that has been examined to improve dental students comfort and knowledge in treating special needs patients is through experiential learning. Kolb et al. describe the experiential learning theory (ELT) as a process that creates knowledge through concrete experience, reflection, conceptualism, and active experimentation.[30] According to Kolb et al., a student who learns through a clinical experience is more likely to grasp and understand information. Watters et al. assessed 364 fourth-year dental students perceived knowledge, beliefs and attitudes towards treating persons with special needs before and after a clinical rotation.[23] They hypothesized that clinical interactions with special needs patients would increase the student's confidence and comfort level. Watters et al. found that students preferred hands-on learning over didactic courses and that they had a better understanding of the barriers this population encounters. The students also stated that they planned on treating persons with special needs in their dental practice once they graduated.[23]

In 2005, Dao et al. assessed whether the education dentists received affected their ability to treat patients with special needs.[8] Data were collected from 208 general dentists in Michigan using a self-administered survey. The survey included questions on the types of patients the dentists are currently treating, how they perceived their dental education prepared them to treat special needs patients, and the effect that their dental education had on their professional behavior, practice characteristics, comfort and confidence treating patients with special needs. Dao et al. concluded that the majority of dentists (69.7%, n=145) felt their education did not prepare them to treat patients with special needs. However, the small percentage of dentists who felt prepared to treat special needs patients (11.2%, n=23) were more confident in providing dental treatment to special needs patients than dentists who responded negatively to their dental education.[8]

A 2016 study by Perusini et al. surveyed 92 dental students at the University of Toronto to determine their expectations and experiences with persons with disabilities.[29] Surveys were administered in 2012 (Phase 1), before students began their clinical rotations at Mount Sinai Hospital's Dentistry Clinic for Persons with Special Needs and then again in 2014 (Phase 2), after the students had completed their rotations. Prior to the clinical rotation (Phase 1), the majority of students (70%; n=64) reported little to no experience with persons with disabilities. Furthermore, 46% (n=42) of students in Phase 1 indicated they did not feel comfortable treating persons with disabilities.[3] After the clinical rotation (Phase 2), 15% (n=14) stated they were uncomfortable treating persons with disabilities.[3] Results from this study suggest that students felt more comfortable

treating persons with disabilities after their clinical interactions with them and that their experience with these patients was more positive.[29]

Statement of Research Questions

Research on dental hygienists and their perceived preparedness on treating special needs patients is limited. The proposed study will examine how prepared dental hygienists are in treating special needs patients. Specifically, this study will survey licensed dental hygienists in the west south-central region of the U.S. The research questions for this study are as follows:

1) What is the perceived preparedness of dental hygienists when treating patients with special needs?
2) How does the level of education and/or experience of the dental hygienist relate to their comfort/confidence to treat patients with special needs?
3) Does the way the dental hygienist learned (didactically or clinically) about special needs patients affect how comfortable/confident they are in treating these individuals?

CHAPTER II

METHODS

Instrument

The assessment instrument that was used was a paper survey consisting of 22 questions comprised of multiple choice, yes or no, Likert-type questions and one open-ended question (Appendix A). The survey was divided into five sections; practice questions asking the respondent about their experience with special needs patients, education on special needs patients, comfort and confidence levels, demographics and an optional open-ended question asking the respondent if they have any comments they would like to add regarding their dental hygiene education on the special needs patient.

The survey began with the definition provided by the American Dental Association (ADA) for the special needs patient to ensure the respondent has a clear understanding of the meaning of special needs patient as it pertained to the survey. According to the ADA, special needs patients are "those patients whose medical, physical, psychological, or social situations make it necessary to modify normal dental routines in order to provide dental treatment for that individual. These individuals include, but are not limited to, people with developmental disabilities, complex medical problems, and significant physical limitations." [21]

Pilot Survey

A pilot survey was administered to four dental hygienists in various practices in Texas and one dental hygiene course instructor at Texas A&M College of Dentistry. The survey was e-mailed to each respondent asking for their participation. In addition to the

survey, each respondent was asked to provide feedback on the survey in the following areas: length of survey, clarity of questions, and suggestions for additional questions.

Modifications were made to the survey based on feedback from the pilot survey, including adding demographic questions, adding an open-ended response and specifying whether the dental hygienist participating was full-time or part-time. The research proposal was then submitted to the Institutional Review Board (IRB) at Texas A&M College of Dentistry which granted an expedited and exempt status (2017-0927-CD-EXM) on January 3, 2018 (Appendix B).

Study Population

The respondents in this study were licensed dental hygienist in the west south-central region of the U.S. The states used in this study were Alabama, Florida, Tennessee and Texas and were chosen based on the ability to access contact information for little to no cost. Dental hygienists with expired or canceled licenses were excluded from this study. The lists of addresses were accessed on each states' dental board website. Based on the lists, there were approximately 35,272 registered dental hygienists with active licenses. A sample size of 1,036 was determined to be a large enough sample to represent these four states based on a 50% response rate and a 95% confidence level.

Survey Procedures

In order to represent each state equally, the number of dental hygienists randomly selected from each list were stratified based on the total number of registered dental hygienists in each state. The results of the stratification can be found in Table F-1. Once the number of dental hygienists needed to represent each state was identified, each list

from the states dental boards website was imported into an Excel spreadsheet and the appropriate number of names and addresses were randomly selected. Each respondent received a cover letter which explained why they were chosen, details about the study, and an invitation to participate (Appendix C). Additionally, a consent form, the survey and a stamped envelope addressed to the investigator at Texas A&M College of Dentistry were provided. After three weeks, all respondents were sent a follow-up letter (Appendix D) which expressed appreciation if they responded; if not they were asked to return the survey as soon as possible. The second point of contact did not include a survey, rather, a link to access the survey and consent form if the respondent was unable to locate the previous sent survey. Upon receipt of the survey, each one was given a four-digit identification number to maintain respondent's anonymity.

Statistical analysis

All of the analyses were completed using IBM SPSS version 25. A significant level of $p=0.05$ was chosen for the statistical comparisons. The majority of variables were dichotomous or nominal and described using a frequency distribution. Assessment between variables were evaluated using Pearson chi-square.

CHAPTER III

RESULTS

Surveys were sent to 1036 registered dental hygienists in Alabama, Florida, Tennessee and Texas. Of the returned surveys, 22 were returned undeliverable and four surveys were returned stating the respondent did not consent. Table F-1 displays the response rate by state. A total of 181 surveys were returned completed, for a response rate of 17.5%. Not every question was required to be answered by respondents, so the response rate for each question varies. Table F-2 is a visual representation of each question and its response rate.

Demographics

Demographic information was collected in survey questions 17-21. Results from this section can be found in Tables F-3 through F-7. The majority of the respondents were white (92.3%, n=167), held an associates degree in dental hygiene (69.1%, n=125) and were currently employed full-time (67.9%, n=123). Over half of the respondents (53.0%, n=96) had been working in the dental field for over 20 years. The final demographics question asked the respondent to specify where they primarily practiced dental hygiene; 79.6% (n=144) indicated they primarily practiced in a general dentistry office. The remaining categories were combined and referred to as "other" (20.4%; n=37).

Practice Questions

The first section of the survey consisted of six multiple choice practice questions. The first two questions asked the respondent if they currently see patients with special needs and if not, why they no longer do. For question one, 80.1% (n=145) of the respondents indicated they currently work with this population; 16.6% (n=30) responded "no, but I have in the past" and 3.3% (n=6) stated "no, I never have." Respondents who selected they "no longer see special needs patients," in question 2, were asked to choose a response that most closely explained why. The majority of respondents who answered (n=25) they had seen special needs patients in the past, 92.0% (n=23) stated they no longer see these patients and 8.0% (n=2) respondents stated the reason they no longer see patients with special needs is because they were not comfortable treating these patients.

Questions three through six asked the respondent how often they saw patients with specific special needs. The specific needs indicated in the survey were the following: question three, a patient with an emotional/mental disability/impairment; question four, a patient with a physical disability or impairment; question five, a patient with an intellectual or cognitive disability/impairment; and question six, a patient with a special medical need. For all four questions, the majority, ranging from 52.6% (n=90) to 66.1% (n=113) of respondents stated they saw a patient with a specific special need one-two times a month. Regarding how often the respondent saw a patient with a specific special need, 5.9%-8.8% (n=10-15) indicated that they "do not know." The specific results of questions three through six can be found in Table F-8.

Education

The second portion of the survey was comprised of five multiple choice questions and one Likert-type question which asked the respondents about their education on special needs patients. Question seven asked where the respondent received the majority of their training on special needs patients. The most common response was on the job training (33.1%, n= 60), followed by a semester in dental hygiene school (19.9%, n=36). Results from question seven are presented in Figure E-1.

Questions eight through ten asked the respondents to specify how they received their education on special needs patients in their dental hygiene program. The majority of respondents (52%, n=81) stated that they spent two hours or less on the subject of special needs patients in their dental hygiene program (Figure E-2). Respondents who indicated they learned about special needs patients in their dental hygiene program, were asked if they received instruction clinically, didactically or both in question number nine. The majority of the respondents (66.2%, n=98) indicated they received clinical instruction. Regarding the frequency the respondent saw a patient with special needs while in dental hygiene school, 39.4% (n=48) indicated they saw a patient with special needs one or more times in a semester, while 42.6% (n=52) indicated they only saw this type of patient one-two times the entire time in the program. Eighteen percent (n=22) respondents, answered they "never" saw a special needs patient.

The respondents who indicated they received both clinical and didactic training were asked which type of instruction was most beneficial in question eleven. The majority chose clinical as the most beneficial training on special needs patients (82.2%,

n=88). Question twelve was a Likert-type question asking how well the respondent felt their dental hygiene education prepared them to treat patients with special needs. Answer choices included the following: over prepared, sufficiently prepared, somewhat prepared and not prepared. The majority of respondents (52.3%, n=80) felt "somewhat prepared" to treat patients with special needs and 30.7% (n=47) respondents answered "sufficiently prepared" (Figure E-3).

Comfort/Confidence Level

Questions thirteen through sixteen asked the respondent about their comfort and confidence level when treating patients with special needs. Question thirteen asked the respondent if they felt comfortable with performing wheel chair transfers. Approximately 38% (n=68) of respondents responded they "usually" feel comfortable, and 33.2% (n=60) "sometimes" feel comfortable (Table F-9). Question 14 asked the respondent if their confidence in treating special needs patients depended on the severity of the disability or impairment. The majority of respondents (70.2%, n=125) responded "yes" (Table F-10). Question fifteen asked the respondent if their confidence treating a patient with special needs depended on their knowledge level. The answer chosen most by respondents was "usually" (38.9%, n=70). Question sixteen asked if the respondent felt more comfortable treating a patient with a special need if they feel more prepared treating this patient. The majority of respondents (92.5%, n=160) stated "yes" (Table F-10).

Statistical Comparisons

In an attempt to answer research question number two, (How does the level of education/experience of the dental hygienist relate to their comfort/confidence to treat patients with special needs?), survey questions 7, 8, 18 and 20 were compared to questions 12-16 to determine any significant statistical correlations (Table F-11). Only two of the relationships proved to be significant. The respondents indicated that the time spent on the subject of special needs in their dental hygiene program positively correlated with their comfort (p=0.003). There was also a positive relationship between respondents who received on the job training and their knowledge-based confidence (p=0.033). All other comparisons were not found to be significant.

Research question number three, (Does the way the dental hygienist learned about special needs patients affect how comfortable/confident they are in treating these patients?), was examined by comparing questions 9 and 10 with questions 12-16. The only comparisons that showed a significant relationship was between both questions 9 and 10, and question 12. In general, respondents who learned about special needs patients clinically were more likely to feel "sufficiently prepared" than respondents who received only didactic instruction (p=0.003) (Table F-12). In addition, respondents who reported they saw a patient at least one time per semester felt their education had sufficiently prepared to treat patients with special needs (p<0.001) (Table F-12).

Open-ended

The final question of the survey was an open-ended question asking if the respondent had any additional comments on the education they received on the special

needs' patient. Approximately 36% (n=65) of the surveys completed, had a comment. Anecdotal comments were collapsed into the following categories: 1) the respondent's education received on patients with special needs (52.3%, n=34); 2) current and future education needed on patients with special needs (29.2%, n=19); and 3) recommendations on how to treat patients with special needs; (18.5%, n=12).

Thirty-four respondents commented on the education they received on patients with special needs. The majority of the respondents (38.2%, n=13) reported that their clinical and/or on the job experience helped them most. The next most common themes reported was the respondents wished they had more education on this population when they attended dental hygiene school (23.5%, n=8) and 23.5% (n=8) stated they had little to no training on this subject. Respondents also reported that they hoped that the education on this subject had increased since they attended dental hygiene school (8.8%, n=3). However, a few respondents (6.0%, n=2) stated they felt that their dental hygiene education was sufficient. They reported that the most valuable trait when treating patients with special needs is empathy and compassion, rather than classroom education.

Of the 19 respondents who commented on current and future dental hygiene education on special needs patients, 63.2% (n=12) agreed there needed to be more education on this subject. The next most common theme regarding current and future education was that dental hygiene education cannot prepare you for treating patients with special needs; confidence and comfort are acquired from on the job experience (21.1%, n=4). Other comments in this category included more specific recommendations

for education with patients with special needs, such as including more information on patients in wheel chairs and or patients with dementia (15.8%, n=3).

CHAPTER IV

DISCUSSION

The goal of this study was to determine whether practicing dental hygienists felt their dental hygiene education had sufficiently prepared them to treat patients with special needs. Question 12 reflects how the respondent felt their education prepared them for treating patients with special needs as well as their comfort level when treating these patients. The responses are represented in Figure E-8. Approximately 69% of respondents indicated that they felt their education somewhat prepared them or did not prepare them to treat patients with special needs. These findings are comparable to Dao et al. who found 69.7% of respondents felt their dental education did not properly prepare them to treat patients with special needs.[8] These findings are also similar to what Byrappagari et al. found which showed that the majority of dentists surveyed (73.3%) felt dental school did not prepare them well for treating patients with special needs.[6]

The results of this study are unique in that it focuses on education of the dental hygienist, not the dentist. The results of this study also found that there was a significant relationship ($p=0.003$) between the time spent on the subject of special needs patients during the dental hygienists' education and their perception of how well their dental hygiene education prepared them to treat patients with special needs. Overall, respondents who designated they spent at least half a semester on the subject of patients with special needs reported that they felt their dental hygiene education had sufficiently prepared them to treat patients with special needs. Similarly, Casamassimo et al. found

that dentists with hands-on experience with patients with special needs in school were less likely to perceive factors such as level of disability and patient behavior as barriers to care. Regardless of time spent on the subject, the majority of respondents of this survey did not feel their dental hygiene education sufficiently prepared to treat patients with special needs.

In terms of what may be considered adequate education regarding how to treat special needs patients, studies suggest adding a service learning course.[8, 23] Service learning is similar to community service. Service learning is mutually beneficial for the student and the population in which they serve whereas community service may only benefit the population served. Studies such as those completed by Keselyak et al., Watters et al., and Perusini et al., determined that the inclusion of some sort of experiential learning (clinical rotations, service-based activity, etc.) resulted in a more positive attitude towards patients with special needs and students tended to prefer hands-on learning with these patients over didactic education.[22, 23, 29] Results of this study show similar trends in that 82% of respondents indicated that they felt their clinical training on patients with special needs was more beneficial than their didactic education.

According to Kolb et al., the dental hygienist who learns through ELT would be more likely to be understand a concept and therefore be more confident in utilizing their learned skill.[30] It is no surprise, then, that 66.2% of respondents in this study indicated that their confidence in treating a patient with special needs usually or always depends on their knowledge of the special need. Although this may be the case, there was no

significant relationship found between the respondent's education on the patient with special needs and their comfort assisting with wheelchair transfers.

Limitations

One limitation of this study is the age of the respondents. The majority (53.0%, n=96) of respondents indicated that they have been in the dental field for over 20 years. The results may be skewed to show that training on special needs patients was inadequate since there was no standard for education on the special needs patients prior to the 2004 revision of CODA guidelines. It would be interesting to see how more recent graduates would respond to the survey due to the additional CODA standard requiring dental programs to include curriculum that necessitates graduates be competent assessing the treatment needs of patients with special needs.

Another limitation of this survey is it failed to ask the gender of the respondent. Kuthy et al. determined that males were more likely to indicate that they would feel comfortable treating patients with special needs with no prior experience with this population than females were.[28] However, this study surveyed dental students, not practicing dental hygienists. It would be interesting to see if there is a difference between dental education and dental hygiene education and how that would affect the comfort level of the male dental hygienist versus the female dental hygienist regarding treating patients with special needs.

One expected result of the study was that the dental hygienist who worked in either a pediatric practice or public health facility would respond that they felt more

comfortable treating patients with special needs. Unfortunately, due to the small response rate of these dental hygienists (<10%), no relationship was determined.

Future Research

Future research on this topic should include dental hygienists in other regions of the United States. The current research on dental hygienists' perceived preparedness when treating patients with special needs only spans a limited number of states (Alabama, Florida, Louisiana, Tennessee and Texas). Additionally, longitudinal research could include a more comprehensive look into dental hygiene programs' curriculum to determine if there is a relationship between clinical and didactic focus on the comfort level of the graduating dental hygienist.

Educational Implications

The majority of respondents felt that their dental hygiene education did not sufficiently prepare them to treat patients with special needs. However, the respondents did feel that experience in the dental field, on the job training and clinical experience was beneficial in increasing their confidence and comfort when treating this population. The addition of a clinical requirement to the CODA standard for dental hygiene education on the special needs population may promote an increased level of confidence and comfort when treating these patients for future graduating dental hygienists.

Inclusion of a mandatory yearly continuing education course on the special needs patient may be beneficial for all dental professionals. Results from this study, as well as previous studies suggest that many dental professionals agree there should be more education on the special needs patient. The inclusion of such a course may increase the

dental professionals comfort level, and, in turn, increase the willingness of practioners to treat special needs patients in their dental practice.

CHAPTER V

CONCLUSION

Results of the survey show approximately 69% of respondents indicated that they felt their education somewhat prepared them or did not prepare them to treat patients with special needs. Results of this study also show that there was a significant relationship ($p=0.003$) between the time spent on the subject of special needs patients during dental hygienists' education and their perception of how well their dental hygiene education prepared them to treat patients with special needs. The number of years of experience in the dental field of the respondent had no significant correlation with their perceived comfort or confidence treating patients with special needs. The majority of anecdotal comments made by the respondents regarding their dental hygiene education indicated they felt that more information on patients with special needs should be included in the dental hygiene curriculum.

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APPENDIX A

SURVEY

Consent Form

Project Title: Registered Dental Hygienists' Perceived Preparedness on Treating the Special Needs Patient

Primary Investigator: Patricia Campbell MS

Protocol Director: Kayla Reed MS-EDHP Candidate, RDH BS

Faculty Advisors: Lisa Mallonee MPH, Kathleen Muzzin MS, and Dr. Peter Buschang

Purpose: You are being asked to participate in a research study to determine your opinion on how your dental hygiene education affects your perceived preparedness on treating the special needs patient.

Procedures: As a respondent in this study, you will be asked to complete a paper survey. It should take you no longer than 20 minutes to complete the survey.

Risks: There are no foreseeable risks or discomforts to subjects.

Benefits: There will be no direct benefit to you by your participation in this research study. Indirectly, the research findings will be published in a peer reviewed journal with hopes of advancing the body of knowledge on needed methods to prepare the dental hygiene professional in the treatment of special needs population.

Confidentiality: Information about you will be kept confidential to the extent permitted or required by law. People who have access to your information include the Principal Investigator and research study personnel. Representatives of regulatory agencies such as the Office of Human Research Protections (OHRP) and entities such as the Texas A&M University Human Research Protection Program may access your records to make sure the study is being run correctly and that information is collected properly.

Results of this study may be used for teaching, research, publications or presentations at scientific meetings. All research material will be held in strictest confidence until the study is completed.

Subjects' Rights: Your participation in this study is voluntary and you are free to withdraw at any time.

For questions about your rights as a research respondent, to provide input regarding research, or if you have questions, complaints, or concerns about the research, you may call the Texas A&M University Human Research Protection Program office by phone at 1-979-458-4067, toll free at 1-855-795-8636, or by email at irb@tamu.edu

Any questions about this study may be directed to Kayla Reed via email at kreed@medicine.tamhsc.edu ; Thesis Chair contact: pcampbell@tamhsc.edu .

I agree to participate in the research study described above. If I have questions, I have been told whom to contact.

- ☐ **Yes, I consent.**
- ☐ **No, I do not consent.**

DENTAL HYGIENE CARE OF PATIENTS WITH SPECIAL NEEDS

For the purpose of this study, the definition provided by the American Dental Association (ADA) for the special needs patient will be used. According to the ADA, "the special needs patient in the dental world is a patient whose medical, physical, psychological, cognitive or social situations make it necessary to consider a wide range of assessment and care options in order to provide dental treatment."

PRACTICE QUESTIONS

1) Do you currently treat patients with special needs?
- o Yes (skip to question #3)
- o No, but I have in the past
- o No, I never have (skip to question #7)

2) If you no longer treat patients with special needs, which of the following statements best describes the reason why.
- o I did not feel comfortable treating patients with special needs
- o I no longer see patients

3) How often did/do you see patients who exhibit an *emotional/mental* disability/impairment?
- o Never
- o One-two times a month
- o One-two times a week
- o Once a day
- o More than once a day
- o Do not know

4) How often did/do you see patients who exhibit a *physical* disability/impairment?
- o Never
- o One-two times a month
- o One-two times a week
- o Once a day
- o More than once a day
- o Do not know

5) How often did/do you see patients who exhibit a *cognitive or intellectual* disability/impairment?
- o Never
- o One-two times a month
- o One-two times a week
- o Once a day
- o More than once a day
- o Do not know

6) How often did/do you see patients who exhibit a special *medical* need?
- o Never
- o One-two times a month
- o One-two times a week
- o Once a day
- o More than once a day
- o Do not know

EDUCATION

7) Where did you receive the MAJORITY of your training on how to treat special needs patients?
- o A class taught in dental hygiene school
- o A small portion of a semester in dental hygiene school
- o Continuing Education Courses
- o Other training not specified here
- o On the job training
- o I did not receive such training (skip to question 13)
- o Do not know

8) Approximately how much time was spent on the subject of special needs patients during your dental hygiene program?
- o 1-2 hours
- o ½ a semester
- o None (skip to question 13)
- o 1 full semester
- o 2 or more semesters

9) Did you learn about special needs patients in your dental hygiene program didactically, clinically or a mixture of both?

o Didactically (skip to question 12)
o Clinically
o Both

10) During the clinical experience dedicated to learning about special needs patients, how often did you actually see a patient with a special need?

o Several times in a semester
o 1–2 times in a semester
o 1-2 times the entire program
o Never

11) If you received both clinical and didactic training on special needs patients, which did you find was *most* beneficial in learning about these patients?

o Clinical
o Didactic

12) How well do you feel your dental hygiene education prepared you to treat patients with special needs?

o Over prepared
o Sufficiently prepared
o Somewhat prepared
o Not prepared

COMFORT/CONFIDENCE LEVEL

13) Do you feel comfortable assisting in wheel chair transfers?

o Always
o Usually
o Sometimes
o Never

14) Does your comfort level treating special needs patients depend on the severity of the disability/impairment?

o Yes
o No

15) Does your confidence in treating special needs patients depend on your knowledge?

o Always
o Usually
o Sometimes
o Never

16) Do you feel more comfortable treating a patient with a special need if you feel more prepared to treat this patient?

o Yes
o No

DEMOGRAPHICS

17) Please select your race.

o White
o American Indian or Alaska Native
o Black or African American
o Native Hawaiian or Other Pacific Islander
o Asian

18) What degree in **dental hygiene** do you hold?

o Associates
o Bachelors
o Masters

19) Which of the following describes your current employment status?

o Full-time
o Temporary
o Part-time
o Unemployed
o Retired

20) Please indicate how long you have been in the dental field.

- o Less than 1 year
- o 1-3 years
- o 4-6 years
- o 7-10 years
- o 11-20 years
- o 20+ years

21) Which of the following most accurately describes where you ***primarily*** practice?

- o Community Health Care Center
- o Education
- o General dentistry office
- o Hospital
- o Indian Reservation
- o Mobile Clinic
- o Nursing home
- o Pediatric office
- o Periodontal office
- o Prison
- o Public Health
- o VA Hospital
- o OTHER_____

OPEN ENDED

22) Do you have anything you wish to add regarding your dental hygiene education on special needs patients?

APPENDIX B

DIVISION OF RESEARCH

TEXAS A&M UNIVERSITY

EXEMPTION DETERMINATION

January 03, 2018

Type of Review:	Submission Correction for Initial Review Submission Form
Title:	REGISTERED DENTAL HYGIENISTS' PERCEIVED PREPAREDNESSON TREATING THE SPECIAL NEEDS PATIENT
Investigator:	Patricia Campbell
IRB ID:	2017-0927-CD-EXM
Reference Number:	067997
Funding:	Texas A&M College of Dentistry
Documents Reviewed:	IRB Application v. 1.0 CONSENT FORM 1.2 SURVEY 1.1 Participant Postcard 2nd Request 1.2 Participant Letter 1st Request 1.1 ReedThesisProposal 1.1
Special Determinations:	N/A
Risk Level of Study:	Not Greater than Minimal Risk under 45 CFR 46 / 21 CFR 56

Dear Patricia Campbell:

The HRPP determined on 01/03/2018that this research meets the criteria for Exemption in accordance with 45 CFR 46.101(b) under Category 3: Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior, if (i) the human subjects are elected or appointed public officials or candidates for public office or (ii) federal statute(s) require(s) that the confidentiality of the subjects identifiable information will be maintained throughout the research and thereafter..

Your exemption is good for five (5) years from the Approval Start Date. At that time, you must contact the IRB with your intent to close the study or request a new determination.

If you have any questions, please contact the IRB Administrative Office at 1-979-458-4067, toll free at 1-855-795-8636.

750 Agronomy Road, Suite 2701
1186 TAMU
College Station, TX 77843-1186

Tel. 979.458.1467 Fax. 979.862.3176
http://rcb.tamu.edu

APPENDIX C

First Cover Letter

Dear Fellow Registered Dental Hygienist,

My name is Kayla Reed and I am a Registered Dental Hygienist currently working towards a Master of Science in Education for Healthcare Professionals (MS-EDHP). I am writing to ask for your participation in a study of Registered Dental Hygienists' preparedness treating the special needs patients. The goal of this study is to determine whether the current practices in dental hygiene programs are sufficient to provide proper education to dental hygienists when treating special needs patients.

As a practicing dental hygienist educated at an accredited institution, you are ideally suited to answer questions regarding your own experiences and comfort level when treating patients with special needs. The responses of practicing dental hygienists such as yourself provide valuable insight to this important topic and could potentially affect the learning of future dental hygiene students.

This survey will take no more than 20 minutes of your time. Please return this survey within two weeks of receiving. If you have any questions or comments regarding this study, please do not hesitate to contact me. I can be reached via e-mail at kreed@medicine.tamhsc.edu

Your participation in this study is voluntary. If you choose to complete the survey, your answers will be confidential and will be released only as summaries in which no individual's answers can be identified. All information that is returned will be coded, encrypted and stored in a locked filing cabinet at Texas A&M College of Dentistry. To maintain anonymity, the second mailing will be handled by an administrative assistant who is not a member of the research team. The potential risk is the unlikely disclosure of your responses. The only way any information can be traced to the respondent is by someone who has access to the coded surveys, the database used to randomly choose respondents and the original data collected from your state dental board webpage. There will be no direct benefit to you by your participation in this research study. Indirectly, the research findings will be published in a peer reviewed journal with hopes of advancing the body of knowledge on needed methods to prepare the dental hygiene professional in the treatment of special needs population.

For questions about your rights as a research respondent, to provide input regarding research, or if you have questions, complaints, or concerns about the research, you may call the Texas A&M University Human Research Protection Program office by phone at 1-979-458-4067, toll free at 1-855-795-8636, or by email at **irb@tamu.edu**.

Thank you for your participation in this study.

Kayla Reed, BS, RDH
Master of Science EDHP Candidate
Texas A&M University
College of Medicine

Patricia R. Campbell, RDH, MS (Thesis Chair)
Executive Director
Caruth School of Dental Hygiene
Texas A&M University, College of Dentistry

APPENDIX D

Second Cover Letter

Dear Fellow Registered Dental Hygienist,

My name is Kayla Reed and I am a Registered Dental Hygienist currently working towards a Master of Science in Education for Healthcare Professionals (MS-EDHP). Last month a questionnaire was sent to you regarding your perceived preparedness for treatment of the special needs patient. If you have already completed and returned your response, please accept my sincere thanks. If you have not yet sent your reply, please do so now.

The survey has been approved by the Texas A&M University College of Dentistry Institutional Review Board. The survey should take approximately 20 minutes of your time.

Your response is very important to my study. Accurate results from this survey are only accomplished with the participation of a large percentage of dental hygienists who return this questionnaire for statistical processing. You are giving your informed consent by completing and returning the survey. Please keep in mind your answers are completely anonymous and will be released only as summaries in which no identifying factors are available.

If you no longer have a copy of the survey, you can access it online at: https://tinyurl.com/ycrypcec

For questions about your rights as a research participant, to provide input regarding research, or if you have questions, complaints, or concerns about the research, you may call the Texas A&M University Human Research Protection Program office by phone at 1-979-458-4067, toll free at 1-855-795-8636, or by email at **irb@tamu.edu**

Please return this survey *today*. If you have any questions or comments regarding this study, please do not hesitate to contact me. I can be reached via e-mail at kreed@medicine.tamhsc.edu

Thank you for participating in this study,

Kayla Reed, BS, RDH
Master of Science EDHP Candidate
Texas A&M University
College of Medicine

Patricia R. Campbell, RDH, MS (Thesis Chair)
Executive Director
Caruth School of Dental Hygiene
Texas A&M University, College of Dentistry

APPENDIX E

RESULTS FIGURES

Figure E-1: Question 7: Where did you receive the MAJORITY of your training on how to treat special needs patients?

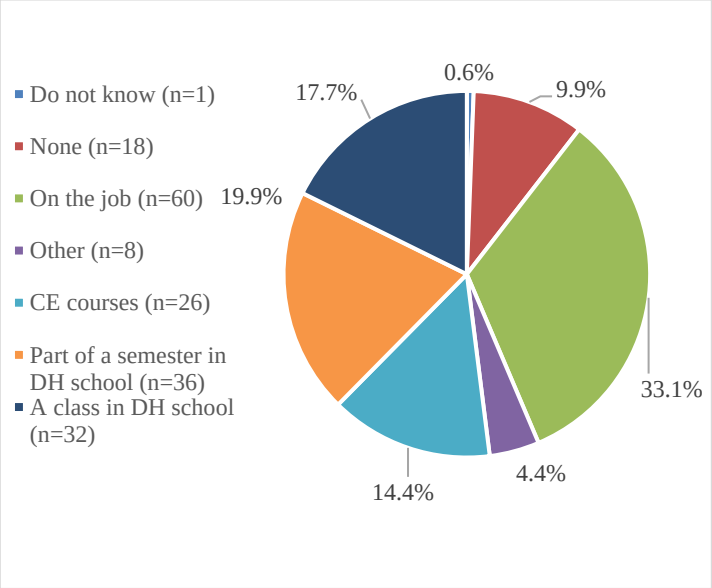


Figure E-2: Question 8: Approximately how much time was spent on the subject of special needs patients during your dental hygiene program?

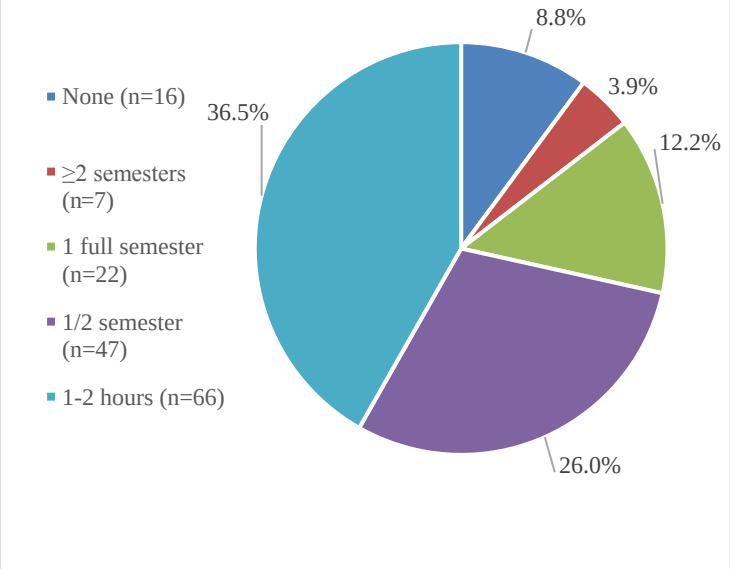
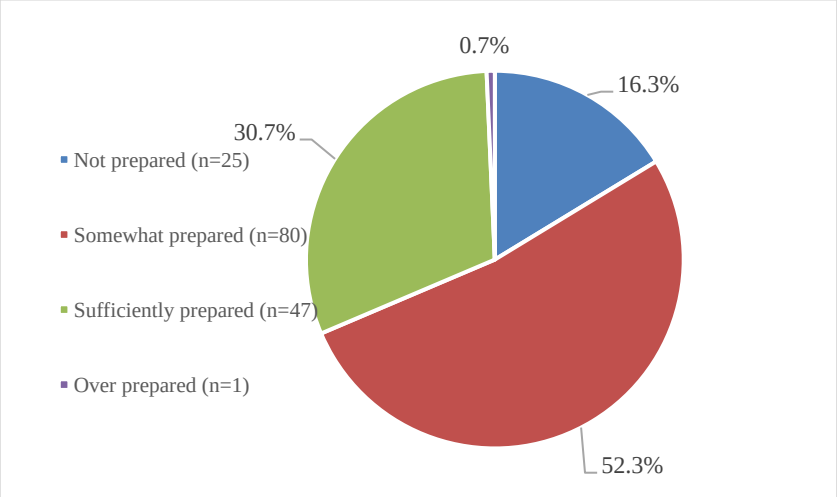


Figure E-3: Question 12: How well do you feel your dental hygiene education prepared you to treat special needs patients?



APPENDIX F

Table F-1. **Stratification of the sample and response rate**

State	Active Dental Hygienists	Sample Size	Sample Size % Total	Number Responding	Response Rate *(number responding/ sample size)*
Alabama	4,219	124	3%	13	10%
Florida	13,378	394	47%	64	16%
Tennessee	4,276	124	3%	23	19%
Texas	13,399	394	47%	81	21%
Total	**35,272**	**1036**	**100%**	**181**	**17%**

Table F-2. **Response rate by question**

Question	Respondents	Did not answer per instructions	Missed question
1	181	0	0
2	25	153	3
3	171	7	1
4	173	7	1
5	172	8	1
6	171	7	3
7	181	0	0
8	158	17	6
9	148	30	3
10	122	57	2
11	107	65	9
12	153	27	1
13	181	0	0
14	180	1	0
15	180	0	1
16	174	0	7
17	176	5	0
18	180	0	1
19	181	0	0
20	181	0	0
21	181	0	0

Table F-3. **Race of respondent**

Race	Number of respondents	% of respondents
White	167	92.3%
Black/African American	5	2.7%
Asian	3	1.7%
American Indian or Alaska Native	0	0%
Native Hawaiian or Other Pacific Islander	1	0.6%
No answer/skipped	5	2.7%
Total	181	100%

Table F-4. **Degree held by respondent**

Degree held in dental hygiene	Number of respondents	% of respondents
Associates	125	69.1%
Bachelors	48	26.5%
Masters	6	3.3%
No answer/skipped	2	1.1%
Total	181	100%

Table F-5. **Employment status of respondent**

Employment status	Number of respondents	% of respondents
Full-time	123	67.9%
Part-time	42	23.2%
Temporary	3	1.7%
Retired	10	5.5%
Unemployed	3	1.7%
No answer/skipped	0	0%
Total	181	100%

Table F-6. **Experience in dental field of respondent**

Length of time in Dental field	Number of respondents	% of respondents
0-10 years	47	26.0%
11-20 years	38	21.0%
20+ years	96	53.0%
No answer/skipped	0	0.0%
Total	181	100%

Table F-7. **Respondent place of employment**

Type of office worked in	Subgroup	Number of respondents	% of respondents
General	General	144	79.6%
	Pediatric	37	20.4%
	Periodontic		
	Public health		
	Community health care center		
	Nursing home		
	VA Hospital		
	Mobile clinic		
	Prison		
	Indian reservation		
	Hospital		
	Education		
Total		181	100%

Table F-8. **Questions 3-6**

How often did you see patients who exhibit a(n)…	Never	1-2 times a month	1-2 times a week	Once a day	More than once a day	Do not know
3) …emotional disability/impairment?	1.2% n=2	66.1% n=113	15.8% n=27	4.7% n=8	6.4% n=11	5.8% n=10
4)…physical disability/impairment?	1.1% n=2	57.2% n=99	23.7% n=41	6.4% n=11	5.2% n=9	6.4% n=11
5) ...cognitive or intellectual disability/impairment?	4.1% n=7	63.4% n=109	18% n=31	3.5% n=6	4.1% n=7	6.9% n=12
6) …special medical need?	4.1% n=7	52.6% n=90	16.4% n=28	8.2% n=14	9.9% n=17	8.8% n=15

**Sum of responses may not equal 181 since not all questions were required to be completed by all respondents*

Table F-9. **Questions 13 & 15**

Question	Never	Sometimes	Usually	Always
13) Do you feel comfortable assisting in wheel chair transfers?	10.5% n=19	33.2% n=60	37.6% n=68	18.8% n=34
15) Does your confidence in treating special needs patients depend on your knowledge?	4.4% n=8	29.4% n=53	38.9% n=70	27.3% n=49

**Sum of responses may not equal 181 since not all questions were required to be completed by all respondents*

Table F-10**. Questions 14 & 16**

Question	Yes	No
14) Does your comfort level treating special needs patients depend on the severity of the disability/impairment?	70.2% n=126	29.8% n=54
16) Do you feel more comfortable treating a patient with a special need if you feel more prepared to treat this patient?	92.5% n=161	7.5% n=13

**Sum of responses may not equal 181 since not all questions were required to be completed by all respondents*

Table F-11. **Bivariate analysis; education level, experience and comfort/confidence**

Question	Education level	Majority of training on SNP	Time spent in school on subject of SNP	Length of time in dental field
12) How well do you feel your dental hygiene education prepared you to treat patients with special needs?	0.078	-	**0.003***	-
13) Do you feel comfortable assisting in wheel chair transfers?	0.228	0.509	0.295	0.059
14) Does your comfort level treating special needs patients depend on the severity of the disability/impairment?	0.157	0.259	0.945	0.744
15) Does your confidence in treating special needs depend on your knowledge?	0.457	**0.033***	0.926	0.591

***$p \leq 0.05$**

Table F-12. **Bivariate analysis: education on special needs patients and comfort/confidence**

Question	Clinical/vs didactic training	How often SNP was seen in DH program
12) How well do you feel your dental hygiene education prepared you to treat patients with special needs?	**0.003***	**<0.001***
13) Do you feel comfortable assisting in wheel chair transfers?	0.466	0.185
14) Does your comfort level treating special needs patients depend on the severity of the disability/impairment?	0.507	0.504
15) Does your confidence in treating special needs depend on your knowledge?	0.450	0.370

***$p \leq 0.05$**