

SCREENING PRACTICES AND INTERVENTIONS BY PEDIATRIC DENTISTS IN
TEXAS TO ADDRESS CHILDHOOD OBESITY

A Thesis

by

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ABSTRACT

Childhood obesity is emerging as a global epidemic that threatens the health and well-being of children in the United States. Early identification of children at risk for obesity is a key public health priority area. The purpose of this study was to examine the screening practices, intervention procedures, barriers to the provision of services, and attitudes of Texas pediatric dentists for those patients who may be at risk for childhood obesity. Participants of this study consisted of a census sample of pediatric dentists currently licensed in Texas. A paper survey was sent to 548 pediatric dentists actively licensed in Texas. One hundred and nineteen pediatric dentists returned the survey for a response rate of 21.7% (n=119). All survey data were coded and entered into an Excel spreadsheet. The ordinal responses were analyzed using descriptive statistics. Findings demonstrated that Texas pediatric dentists agree they have a role in helping children achieve a healthy weight due to the implications of weight to general health. Respondents indicated positive interest towards providing healthy weight interventions. Approximately 36% (n=43) of Texas pediatric dentists agreed they are willing to employ a screening tool to identify those children at-risk for obesity, 19% (n=23) are open to inclusion of behavior-modification programs and 35% (n=42) are willing to offer dietary counseling in their practices. Lack of parental motivation was identified by 54% (n=64) as the greatest barrier to the provision of obesity related services. Additionally, 47% (n=56) felt lack of parental acceptance to advice and 31% (n=49) felt fear of offending the parent were significant deterrents. Texas pediatric dentists identified notable

incentives needed to confidently address at-risk populations for childhood obesity. Fifty-nine percent (n=70) identified the need for more CE courses on the topic of obesity and 57% (n=68) felt there needed to be established clinical guidelines to integrate during patient care. Fifty-three percent of practitioners (n=63) felt there was a need for more evidence supporting the link between obesity and dental disease. Sixty-three percent (n=74) report they would be more likely to include obesity related interventions in their practice if there was increased availability of patient education resources. Their opinions are independent of their age, area of practice and years of practice. Future studies need to determine if the pediatric dentists' perceived barriers to the provision of obesity related services are in fact offensive and not wanted by parents. Future studies could investigate which interventions are most successful and acceptable to children and their parents. Interprofessional collaboration is needed among educators, pediatric health care providers, oral health care providers, parents and community leaders to advocate for societal changes that may lead to a reduction in the prevalence of childhood obesity.

DEDICATION

My journey as a dental hygienist has been influenced by many professional role models who have helped shape the trajectory of my career. I would like to dedicate this thesis to Gail Pesterfield RDH, Thomas Tennery DDS, Steven Newby DDS, Arlon Hoermann DDS, and Lana Crawford RDH. Each one gave me encouragement and support to pursue opportunities within my chosen profession.

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Contributors

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NOMENCLATURE

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|--------|--------------------------------------------------|
| AAPD | American Academy of Pediatric Dentistry |
| ADA | American Dental Association |
| ADHA | American Dental Hygienists' Association |
| AN | Acanthosis Nigricans |
| BMI | Body Mass Index |
| CAMBRA | Caries Management by Risk Assessment |
| CDC | Centers for Disease Control and Prevention |
| CE | Continuing education |
| CODA | Commission on Dental Accreditation |
| HWI | Healthy Weight Intervention |
| IRB | Institutional Review Board |
| MI | Motivational Interviewing |
| NHANES | National Health and Nutrition Examination Survey |
| TSBDE | Texas State Board of Dental Examiners |
| WHO | World Health Organization |

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1. INTRODUCTION AND LITERATURE REVIEW

1.1 History

Since the 1970's, the prevalence of childhood obesity has tripled in the United States.¹ Results from the 2015-2016 National Health and Nutrition Examination Survey (NHANES), estimate that 18.5% of US children and adolescents ages 2-19 are obese.² One in three children in the state of Texas is considered overweight or obese, ranking Texas in the top 15 states for prevalence of childhood obesity.¹ Historically, identification and assessment of childhood obesity have been the responsibility of the pediatrician or family physician.^{3,4} Pediatricians have long-term relationships with children from birth to adulthood with metrics in place to monitor weight status at annual wellness visits. There is a culture of prevention among pediatricians as well as a notable sense of trustworthiness.³ As the prevalence of children with overweight and obesity issues has risen dramatically, it is no longer an effective strategy to only screen at well-child visits.⁴ There is a need for united efforts across the health professions to address this growing public health concern. In 2016, the American Academy of Pediatric Dentistry joined a collaborative initiative with the American Dental Hygienists' Association, the American Dental Association, the Santa Fe Group and the National Maternal and Child Oral Health Resource Center in order to identify the role oral healthcare professionals can play in the fight against childhood obesity.⁵

Pediatric dentists and dental hygienists are uniquely positioned to identify children at-risk for childhood obesity due to the frequency of recare appointments.⁴ The

same domains of long-term relationships, culture of prevention and trustworthiness exist between pediatric dental patients, their parents, and pediatric dentists.⁴ The 2016 National Survey of Children's Health found that 77.1% of Texas children, ages 1-17, had a preventive medical care visit during the previous year and 77.5% of Texas children, ages 1-17, had a preventive dental visit during the previous year; therefore, due to the frequency of dental recare appointments the pediatric dental visit could be another viable strategy for obesity screening.⁶

Overweight and obesity are defined as excess body weight and generally measured by Body Mass Index (BMI).^{4,7} However for children and adolescents, BMI is age and sex-specific to account for growing bodies and variances between sexes.^{2,4,7-9} The Centers for Disease Control and Prevention (CDC) has produced the widely accepted CDC Growth Charts. These growth charts state when children, ages 2-19, present with a BMI greater than 85% of the reference population they are classified as overweight. Children with a BMI greater than 95% are considered obese.^{2,4,7-9} In infants and toddlers from birth to 2 years old, recumbent length is measured instead of standing height. Weight related to recumbent length is determined to be high if at or above the 95th percentile of the CDC growth chart.^{4,7-8}

A serious concern for all healthcare providers is the link between obesity and chronic diseases. Overweight children are at an increased risk for developing hypertension, type 2 diabetes, psychological problems, respiratory ailments, sleep apnea, orthopedic difficulties, and high cholesterol.^{1,4,7,10-12} Overweight and obese children have a 70% higher risk of becoming overweight adults, which increases to 80% if one or

both parents are overweight.^{1,4,7-8,10-12} Overweight children who become obese adults will carry an increased risk for developing diabetes and other chronic diseases.¹² The Healthy People initiative identifies overweight children as a priority concern. The ongoing high rates of childhood obesity provided the impetus for the authors of Healthy People 2020 to reduce the target for children with obesity to 14.5%.¹³ According to the World Health Organization (WHO), childhood obesity is emerging as a global epidemic; therefore, early identification of children at-risk for obesity warrants a high priority.¹⁰ Due to a lack of research, little is known about the screening practices, intervention procedures, and attitudes applied by Texas pediatric dentists regarding their patients who may be at-risk for childhood obesity.

1.2 Screening Procedures

Screening procedures that may be used to identify at-risk children in the pediatric dental setting include anthropometric measurements, blood pressure, body mass index, and extra-oral examination that includes Acanthosis Nigricans (AN) detection.¹⁰ AN is a predictable cutaneous marker associated with obesity and found in up to 90% of children with type 2 diabetes.¹⁴⁻¹⁵ Many Texas pediatric dentists assess weight, height and blood pressure due to the use of conscious sedation; BMI calculation can be easily determined with this data. A simple extra-oral exam can detect the presence of AN on the necks of children. These screening tools may be used to identify children at-risk for obesity and then offer an appropriate Healthy Weight Intervention (HWI).¹¹ Pediatric dental practices could be encouraged to use screening tools available within their scope of practice and refer children identified as at-risk to primary care providers and/or

registered dietitians for an intervention for obesity prevention. A culturally competent and positive approach must be employed to effectively educate the parent or caregiver and relay the importance of the intervention.⁴

1.3 Interventions

An intentional coordination of efforts directed at prevention and intervention is needed by the dental community to address the development of weight-related health problems presenting in pediatric patients. Dental professionals have tools within their scope of practice to promote the prevention of childhood obesity. These tools include screening and identification of patients at risk for overweight/obesity, nutritional counseling, Motivational Interviewing (MI) to promote healthy weight, and referral to a primary care physician for weight loss counseling. Motivational Interviewing in health care can be defined as a goal-directed approach for eliciting behavior change.

Tavares and Chomitz developed and tested a Healthy Weight Intervention (HWI) protocol based on Motivational Interviewing with pediatric dental patients.¹¹ This study tested the HWI on 139 participants, ages 6-13, during two or three subsequent preventive dental visits. A dental hygienist collected anthropometric data and information relevant to obesity risk factors during each recare visit over 18 months. Each child received a personalized “Health Report Card” with healthy recommendations for lifestyle behavior modification. Each child chose one “healthy living” goal for each 6-month recare visit over the 18 month period. Children with a BMI over 85% of the reference population were referred to a primary care provider.¹¹ The conclusions of this study found the HWI to be feasible and appropriate for use in a pediatric dental setting and significantly useful

to the child participants, their caregivers, and the oral health care providers. Tavares and Chomitz reported that 97% of caregivers (n=65.0) found the Healthy Weight Interventions to be helpful.¹¹

In a survey of nutritional counseling practices of North Carolina pediatric dentists, Braithwaite et al. concluded the pediatric dental office is an untapped resource to address childhood obesity.¹⁶ In the Braithwaite study, 77% of the dentists (n=53.9) reported nutritional training in their dental school experiences and 69% (n=48.3) were interested in CE courses related to nutrition. The data from this study indicated that 67% of the dentists (n=46.9) did not record the weight of their patients and 94% (n=65.8) did not record height; however, all should have the ability and could use the child's BMI score as a tool for discussion.¹⁶ Lee et al. analyzed data from a national survey of 1,779 participating pediatric dentists and discovered the pediatric dentists who offered dietary counseling related to caries and/or weight loss were more likely to screen for oral cancer, offer tobacco and alcohol cessation programs, and monitor blood pressure (all $P < .001$). Lee et al. discovered several practice indicators linked with the provision of weight-related interventions.¹⁷ Provision of healthy weight interventions was more common among providers who were female, Hispanic, solo practitioners and those who received advanced training in counseling techniques during dental school.¹⁷ Lowenstein et al. surveyed North Carolina pediatricians regarding childhood obesity counseling and discovered three significant findings: providers were confident (78.5%, n=96) or very confident (95.3%, n=117) and expected lasting change (64.2%, n=79), providers that included obesity counseling in their practices were more likely to be female (68.3%,

n=84) and provider attitudes are associated with reported frequency of counseling services.¹⁸

1.4 Barriers

Significant barriers to the implementation of healthy weight interventions in the pediatric dental office have been reported. Fear of offending the child and parent, lack of adequate training and knowledge, inadequate time during examinations, and inadequate options for referral are all notable barriers that may affect a dental health provider's willingness to address obesity issues.^{16, 17, 19} The most significant barrier to the implementation of a healthy weight intervention is the ability to communicate a child's weight status to the parent or caregiver in an appropriate manner.⁴ Cultural competence, compassion, and motivational interviewing skills are needed to effectively approach children and their parents in order to achieve a positive outcome. Tseng et al. identified three relevant topics as important to discuss with children and their parents: the definition of BMI and childhood overweight/obesity, the negative health implications of being overweight, and the dentist's recommendations and rationale for a weight loss intervention.⁴

1.5 The Role of the Pediatric Oral Healthcare Provider

The consequences for Texas children may prove significant if the obesity trend is not reversed. Health care costs in Texas, as well as the United States, may be drastically affected by obesity-related conditions.¹⁰ It has become increasingly urgent that new systems and modalities designed for the prevention of obesity in children be

implemented with the use of evidence-based screening tools, healthy weight interventions, and the examination of risk factors affecting the health status of children.¹⁰

A recent report by Hales et al. analyzed obesity prevalence data from the 2015-2016 National Health and Nutrition Examination Survey (NHANES). According to the authors, obesity rates continue to be high in the United States with a prevalence of obesity in children and adolescents aged 2-19 at 18.5 % and 39.8% in adults.² *The State of Obesity: Better Policies for a Healthier America* reports the combined overweight and obesity rate for Texas children ages 10-17 years is 33.3% and the obesity rate for Texas adults is 33.7%. Out of the 50 states and Washington DC, Texas children ages 10-17 are ranked number 15 and Texas adults are ranked number 8 based on current statistics for these ages in the overweight and obesity category.²

Curran et al. conducted a survey of 8,000 members of the American Dental Association. A total of 2,965 respondents included 1,186 general dentists and 1,779 pediatric dentists. The survey found the pediatric dentists were generally more likely to support an active role in helping their patients achieve weight loss goals than were the general dentists.¹⁹ Only 4.6% (n=81) of those pediatric dentists surveyed initiated a brief discussion about weight loss with their patients, 3.2% (n=58) initiated a referral to a medical specialist for a weight loss intervention, and less than 2% (n=29) delegated nutritional counseling to a dental hygienist.¹⁹

Braithwaite et al. surveyed 70 North Carolina pediatric dentists and found 77% (n=54) reported nutritional training in dental school. This study determined that participants who were both knowledgeable and confident about nutritional counseling

were more likely to offer these services to their child patients.¹⁶ A qualitative study by Lee et al. found similar findings among a random sample of 4,154 pediatric dentists in the United States. Pediatric dentists were more likely to be confident and effective after specialized training. It was also determined that educational programs coupled with public and professional advocacy may alleviate dentists' fear of offending patients and their parents.¹⁷

Kading et al. surveyed 246 North Carolina dental hygienists in order to determine confidence levels in their ability to offer nutritional counseling and behavior modification skills related to obesity prevention and management.²⁰ Forty-three percent (n=106) of the hygienists surveyed reported an increase in overweight patients in their practices.²⁰ The authors found 65% (n=160) of the participants were confident to discuss the health risks of obesity with a patient, 60% (n=148) were confident to refer a patient to a specialist for weight loss guidance, 90% (n=221) reported training in nutritional counseling, and 95% (n=234) felt dental hygienists have a role in helping patients improve nutrition.²⁰

Cole et al. employed a cross-sectional survey research design with a random sample of 13,357 dental hygienists. The recent study resulted in 919 respondents participating in the electronic survey. The authors confirmed that a majority of dental hygienists (99%, n=910) have an understanding of the risk of obesity, but need further training (58%, n=533) in order to confidently provide obesity counseling in clinical practice. The commonly held belief that parents and children may resist obesity

counseling (51%, n=468) could be addressed with additional knowledge, continuing education, and confidence for the oral health care providers.²¹

Early detection of children at risk for childhood obesity by periodic screening in the pediatric dental setting may be a first step in identification and intervention. Longitudinal collection of anthropometric measurements beginning at the first dental visit may facilitate relevant data of a child's growth and development.⁴ Tseng et al. concluded that pediatric dental teams should weigh and measure children, calculate BMI, assess diet and physical activity, and monitor growth trajectories on a regular basis. Unhealthy weight status should be reported in a culturally sensitive manner to the parent or guardian.⁴

Falkner and Gidding report a consistent association between body weight and elevated blood pressure in overweight and obese children.²² Tu et al. found a significant increase in high blood pressure in the cohort of children whose BMI measurements were in the overweight range.²³ Furthermore, Tu et al. report the strongest indicator of high blood pressure in young adulthood was a high adiposity rate as a child.²³ Moore et al. investigated the relationship between blood pressure and BMI in a cohort of 767 children, ages 5-18, in a multiethnic population in southwestern Oklahoma. A strong association was found between overweight children with a BMI above the 85th percentile and an elevated blood pressure above the 90th percentile categorized according to the National High Blood Pressure Education Program Working Group on Hypertension Control in Children and Adolescents Report.²⁴ This study concluded that children with a

high BMI coupled with elevated blood pressure, over a prolonged period of time, are at an increased risk for cardiovascular events.²⁴

Otto et al. at the University of Texas-Pan American conducted a nonexperimental retrospective quantitative study utilizing 32,788 records from the state of Texas Health Screening for School-age Children program.¹⁰ The purpose of this study was to investigate the relationships between BMI, blood pressure, gender and Acanthosis Nigricans (AN) in school-age children in grades 1-9 in the Laredo, Texas school district.¹⁰ Acanthosis Nigricans is defined as a cutaneous marker characterized by hyperkeratosis, hyperpigmentation, and papillomatosis.^{10,14-15,25-28} AN is associated with hyperinsulinemia and insulin resistance and is considered a marker for type 2 diabetes. Otto et al. found as a child's BMI increases; the child is more likely to have positive evidence of AN. Additional results indicated the use of the AN marker as a screening tool in school-age children may have value in predicting the future development of type 2 diabetes in overweight/obese children.¹⁰

Kong et al. conducted a cross-sectional study with 1,133 participants in order to investigate the association of risk factors for type 2 diabetes and AN in young people.²⁸ The authors found the prevalence of AN increased as the number of risk factors for disease increased. The risk factors included were a family history of type 2 diabetes mellitus, overweight/obesity, hypertension, and minority ethnicity.²⁸ For example, children (ages 7-19 years) with a family history of type 2 diabetes were twice as likely to present with AN (21.4%, n=313) compared with those children with no family history of diabetes (8.8%, n=170). Less than 3% (n=13) of the children with a normal weight

presented with AN compared to 11.2% (n=80) of overweight children and 51.2% (n=129) of obese children. Children with hypertension presented with a manifestation of AN 68.8% (n=16) of the time as compared to 15.2% (n=467) of children without hypertension.²⁸ An unexpected finding of this study was the detection of AN led to discussions about healthy lifestyle behavior modifications that were not planned and patients were receptive to the prevention counseling.²⁸ While an elevated BMI may not raise concern for parents or physicians, the abnormal appearance of AN can act as a motivator for children, their parents, and physicians to take action.^{15,25,28}

Many barriers may exist for the implementation of a screening, counseling, and referral protocol of overweight pediatric dental patients. Braithwaite et al. found considerable barriers that survey participants indicated had an impact on the provision of counseling services.¹⁶ The lack of qualified staff to provide counseling services was noted by 60% (n=42) of the participants. The authors conclude that this barrier can be addressed by continuing education (CE) opportunities and by advocacy from the employer. The personal lack of nutritional knowledge was reported by 47% (n=33) of the dentists surveyed.¹⁶ Other barriers reported were lack of time, lack of interest by the patient or caregivers, and no financial incentive. Braithwaite et al. investigated the likelihood of provision of counseling services compared to levels of academic training and found a significant predictor when pediatric dental resident training included nutrition and healthy lifestyle courses.¹⁶ Fifty-six percent (n=39) of dentists in this study confirmed that the pediatric dental office is an appropriate setting for comprehensive nutritional counseling services.¹⁶ Lee et al. studied barriers to offering counseling

services and found more than half of the respondents reported fear of offending the patient/parents and fear of appearing judgmental to be the main barriers among pediatric dentists.¹⁷ The authors conclude that professional advocacy and continuing education could properly address these fears.¹⁷ Curran et al. compared the responses of general dentists to pediatric dentists regarding the barriers to offering weight-related screening and counseling services.¹⁹ The pediatric dentists were found to be more confident in their skills and more likely to initiate and support patients with weight loss goals. These findings are likely due to the fact that 80.4% of pediatric dentists report nutritional training in their dental school training compared to 60.6% of general dentists.¹⁹ Pediatric dentists were much less likely than general dentists to note a lack of education, lack of trained staff, referral options, and lack of interest as barriers to the provision of services.¹⁹

In 2016, Wright and Casamissimo surveyed 7,450 pediatric dentists and residents in order to compare and contrast the provision of services related to the prevention of childhood obesity and the reduction of the intake of sugar-sweetened beverages.²⁹ The authors found 73% (n=1,178) of the 1,615 respondents agreed that pediatric dentists have a role in helping children maintain a healthy weight.²⁹ While only 17% (n=205 out of 1211) of the dentists reported offering weight-related services, 67% (n=1,082) of those who did not offer weight-related services were interested in the establishment of a healthy weight protocol.²⁹

Currently, there is limited evidence that demonstrates which interventions and/or screening practices are routinely performed by pediatric dentists to identify and address

risk factors specific to childhood obesity. The purpose of this study was to investigate: 1) the general attitudes and opinions of pediatric dentists in Texas regarding the provision of services and information related to obesity of child patients, 2) the current delivery of information and services to the parents of child patients at risk for being overweight and obese, 3) barriers to providing information and services, and 4) incentives for providing information and services related to obesity and achieving a healthy weight for child patients. It is hoped that the results of this study will raise awareness of the positive impact of periodic screenings and appropriate interventions regarding childhood obesity in the Texas pediatric dental setting. The research questions for this study follow:

1. What are the attitudes of Texas pediatric dentists regarding the provision of information or interventions targeted to the goals of a healthy weight for child patients ages 0-17?

2. What services are performed in the pediatric dental office, such as providing information or counseling, with the goal of helping patients ages 0-17 achieve a healthy weight?

3. What are the barriers related to the provision of services with the goal of helping parents achieve a healthy weight for child patients ages 0-17?

4. What factors might encourage the pediatric dentist to provide services related to healthy weight and obesity for child patients ages 0-17?

2. METHODS AND MATERIALS

2.1 Sampling Strategy

The sample population for this project consisted of a census sample of pediatric dentists from the state of Texas. An electronic list of pediatric dentists was acquired from the Texas State Board of Dental Examiners. Pediatric dentists with an expired, revoked, enforced suspension, canceled, retired or deceased status were excluded. Approximately 548 pediatric dentists were listed as having an active status. All 548 active pediatric dentists were chosen to be included in the sample population.

2.2 Survey Instrument

The investigators acquired permission, from the Pediatric Oral Health Research and Policy Center of the American Academy of Pediatric Dentistry and Dr. Robin Wright, to use a previously administered survey regarding childhood obesity. The survey instrument (Appendix A) was adapted to include questions from five domains: attitudes and opinions regarding screening procedures for comorbidities of childhood obesity, referral practices and interventions employed in the state of Texas, barriers to the provision of healthy weight services, incentives for provision of healthy weight services, and demographics.

In section one of the survey, participants were asked to rate the effectiveness of their abilities to identify children at risk for obesity. Respondents were asked to rate their opinions regarding the feasibility of the provision of screening services in the dental office and they were asked to report if parents had requested advice regarding healthy

weight for their child. Section two included questions regarding the current delivery of services. The dentists were asked how often 11 specific weight-related services are performed in their offices. The respondents were questioned about their interest in the establishment of a healthy weight protocol and asked to provide comments if they were not interested. Section two ended by asking the dentists to mark which of 13 intervention methods they would consider using. Section three asked participants to identify 19 potential barriers as major, minor, or not a barrier. Section four asked the dentists to identify which of 13 factors would encourage them to provide services related to childhood obesity. Section five was the demographic section, which asked questions about the state and county where their practice is located and whether their practice location was rural, suburban or urban. Information was asked about current employment status, number of years in the practice of pediatric dentistry and practice type. The respondents were asked to report their age, gender and self-described weight status. The survey closed with an invitation to leave any additional comment with the investigator regarding the screening of childhood obesity in the pediatric dental office.

2.3 Pilot Testing Survey

The survey instrument was pilot tested with 16 pediatric dental residents at Texas A&M University College of Dentistry. The residents were given the paper survey and asked to complete the survey as well as a questionnaire regarding their opinions of the survey. The survey took 5-16 minutes to complete and the pilot test survey questionnaire (Appendix B) was completed by each of the participants. The majority of the residents stated they would prefer an electronic version of the survey; however, there was no

practical way to obtain email addresses of all active licensed pediatric dentists in Texas. Accurate mailing addresses are posted on the TSBDE website due to a statutory requirement for current addresses to be updated within 60 days of an address change. The residents reported the survey questions were delivered in a logical sequence and were easy to follow. There were no modifications made to the survey. A proposed timeline (Appendix C) was created to guide the project. A proposed budget (Appendix D) was created, and no additional funds were needed. The research proposal was submitted to the Institutional Review Board (IRB) at Texas A&M University College of Dentistry, which granted an expedited status (2017-0476-CD-EXM) on July 21, 2017 (Appendix E).

2.4 Survey Mailing and Tracking

Initially, 548 survey packets were mailed to every active licensed pediatric dentist in Texas. To maintain the anonymity of the respondents, each survey was assigned a six-digit number and logged in by the investigator as they were returned to Texas A&M University College of Dentistry. The survey packages included a cover letter explaining the study with an invitation to participate (Appendix F), consent form, survey, and stamped return envelope. A second letter (Appendix G) was mailed approximately four weeks later to all non-respondents with a request to return the original survey or contact the investigator for another survey if needed.

2.5 Informed Consent and Confidentiality

Informed consent was requested and obtained with a signed consent form (Appendix A). Participation was voluntary and the participants were free to withdraw at

any time. The investigators were the only individuals with access to the survey information. Six survey packages were returned as undeliverable. The returned surveys were stored in a locked drawer in room 136A at Texas A&M University College of Dentistry.

2.6 Data Analysis

All survey data was coded and entered into an Excel spreadsheet. The data was analyzed using the statistical analysis program GraphPad 6.0 for Windows (GraphPad Software Inc., La Jolla, CA). Descriptive statistics, primarily frequencies and percentages, were used to assess the ordinal responses. Initially, non-parametric Chi-square row by column test for independence was used to assess differences in answers to “opinion-questions” (dependent variable) among various factors (independent variables), including years of practice, area of practice, and demographics of dentists. However, no dependent relationships were found (significance level was set at $\alpha = 0.05$), thus no results of Chi-square tests were reported.

3. RESULTS

Of the 548 surveys mailed to active Texas pediatric dentists, 6 were returned as undeliverable leaving a total of 542. Eighty-seven surveys were returned after the first mailing and thirty-two were returned after the second mailing for a total of 119 returned surveys. Two respondents declined to participate due to closed practices. The participating response rate was 21.4% (n= 117). According to Visser et al., this is considered a good response rate (>20%).³⁰ Not all participants answered every question; therefore, the number of responses to each question varies. Descriptive statistics were generated for all survey components using Excel. Open-ended comments were transcribed and analyzed by themes. For this study, the margin of error is around 8% for a 95% confidence interval with n=117 out of 548.

3.1 General Attitudes and Opinions of Pediatric Dentists

The first section of the survey consisted of a five-point Likert scale, which asked the pediatric dentists to rate their effectiveness in their ability to perform six different tasks related to screening or referral of child patients. The majority of dentists (89.7%, n=105) felt effective to very effective in their ability to weigh children and measure their height. Greater than 57% (n=67) felt effective to very effective in their ability to calculate and interpret body mass index (BMI). The majority (77.8%, n=91) were confident in their ability to identify a child at risk for obesity. In this section regarding attitudes and opinions, pediatric dentists were asked to rate their ability to advise parents, refer children to a specialist and persuade parents to follow their advice. The perceived

effectiveness declined to less than 50% in these categories, with the ability to persuade parents to follow their advice on weight management as the lowest confidence level of 21.4% (n=25).

Question 3 of the survey asked dentists to rate their opinions on nine various statements. The highest level of agreement (81.2%, n=95) was on the statement “a dentist who appears physically fit is more credible when providing obesity counseling to parents.” A similarly high level of agreement was found on the statement “if a link between obesity and oral health status is determined, then I would be interested in advising parents about weight management for their children” (80.4%, n=94). Eighty-eight (75.2%) respondents agreed that dentists have a role in helping children achieve a healthy weight because of the importance of weight to general health. Low levels of agreement were found on questions regarding parents’ willingness to pay more for weight-related advice (5.1%, n= 6), parents’ receptiveness for counseling in the dental office (16.3%, n= 19) and if parents think it is important for dentists to screen children for obesity (6%, n=7).

Question 4 inquired if parents had asked for advice about obesity and healthy weight options for their child. The majority responded no (83.8%, n=98). Of the 16 dentists that responded yes, 14 were in private practice, 13 have been in practice greater than 15 years, 14 are over 40 years of age, and 15 are of an appropriate weight status.

3.2 Current Delivery of Services

Question 5 asked if the dentists were currently offering childhood obesity information or other healthy weight interventions for patients, only 18.8% (n=22) responded yes. Of the 22 that responded yes, 13 were in an urban practice, 14 have been in practice greater than 15 years, 18 are over 40 years of age and 19 are in an appropriate weight status.

Question 6 asked the dentists to indicate which procedures are performed in their offices. Eleven different services were listed. Due to the frequent provision of local anesthesia and/or sedation to children in dentistry, the results regarding the taking and recording of blood pressure (85.5%, n=100) and weighing children (79.5%, n= 93) were expected. The height of children is measured in 35.9% (n=42) of the respondents' offices and BMI is calculated in only 23% (n=27) of the practices. Screening for Acanthosis Nigricans (AN) during an extra-oral exam is done in 29% (n=34) of the offices. Dentists report making chart notations if a child shows signs of obesity 66.6% (n=78) of the time. Educational materials, discussions with parents, follow-up communications, or behavior modification programs such as motivational interviewing are offered in less than half of the practices. Refer to Figure H.1 for a summary of the current delivery of services by the responding dentists.

Regarding survey question 7, "Are you interested in establishing a protocol to advise parents on healthy weight goals?" 60.7% (n= 71) responded yes and 32.5% (n=38) responded no. All dentists in academia, hospital and public health practices

responded yes. Those who responded no were given the opportunity to comment, and those comments are categorized by theme in Table I.1.

Question 8 asked the dentists to mark intervention methods they would consider using in their practice. Refer to Figure H.2 for a summary of the results. The majority of respondents would consider taking blood pressure, weighing children, measuring children's height, calculating BMI, making chart notations if signs of obesity are present, talking to parents about their observations, the provision of educational materials, and the provision of a referral for children identified as overweight or obese. Less than 50% of the respondents would consider screening for AN during an extraoral exam, use of a self-administered screening tool, weight counseling, behavior modification programs such as motivational interviews, or follow-up communications.

3.3 Barriers to the Provision of Services

Question 9 asked dentists to identify a list of 19 potential barriers that are faced in dental offices related to the provision of interventions with the goal of helping parents achieve a healthy weight for child patients. The respondents were asked to identify the barriers as a major barrier, minor barrier or not a barrier. Figure H.3 summarizes the findings of barriers to the provision of information and services. The following statements were considered major barriers: fear of offending the parent, fear of appearing judgmental of parents, lack of parental acceptance of advice from a dentist, may create parental dissatisfaction, and lack of parental motivation. Each of these major barriers related to perceived parental reactions. The following statements were considered minor barriers: lack of trained personnel to perform this service, lack of

personal knowledge or training about childhood obesity, lack of time in the daily schedule, lack of knowledge of how to start the conversation and dietary recommendations about childhood obesity are confusing. The following statements did not present a barrier: may be seen as practicing medicine by the state board, no additional fees charged to parents, lack of 3rd party payers, lack of training in communication skills, low income of parents and low educational level of parents.

3.4 Incentives to the Provision of Services and Information

Question 10 asked pediatric dentists to identify factors that would incentivize the provision of information or interventions related to obesity and achievement of a healthy weight for child patients. Figure H.4 summarizes the findings of the incentives for the provision of information and services. The majority of respondents answered yes to all but four factors. The parents' willingness to pay, more marketability and greater parent satisfaction within the practice were not factors that would encourage the provision of additional services. Increased credibility in the opinion of parents was a factor with approximately half of the respondents (n=59).

3.5 Demographics

The last section of the survey, questions 11-19 asked demographic questions starting with question 11 regarding dental practice location (Table I.2). The largest group of respondents (46.2%, n=54) practice in a suburban setting. The second largest group (41.9%, n=49) practice in an urban location. The third and smallest group (8.5%, n=10) practice in a rural setting.

Question 12 inquired about practice type (Table I.3). The largest number of respondents (87.2%, n=102) practice in a private practice setting. Five respondents (4.3%) reported working in an academic/research setting. Four respondents (3.4%) reported working in a corporate setting. Four respondents (3.4%) declined to answer. The smallest groups were public health and hospital practice types with one respondent each. None of the pediatric dentists reported working in a government practice type.

Question 13 identified approximately half of the respondents (49.6%, n=58) practice as sole proprietors (Table I.4). Twenty-one (17.9%) of the pediatric dentists work in a partner employment situation with two or more owners. Nineteen respondents (16.2%) are considered employees. Fourteen dentists (12.0%) report they practice as independent contractors. One dentist reported not working and one dentist reported “other” due to a closed practice.

Question 14 inquired about the number of years practicing as a pediatric dentist (Table I.5). The largest group of respondents (34.2%, n=40) had been in practice for more than 25 years. The second largest group (30.8%, n=36) had practiced 16 to 25 years. The next highest group (12.8%, n=15) practiced for 11 to 15 years. Twelve respondents (10.3%) report being in practice for six to ten years and the smallest group (9.4%, n=11) report five years or less of practice.

Question 15 asked respondents to list the state or U.S. territory that they practice in most. The majority of respondents practiced pediatric dentistry (89.7%, n=105) in Texas (Table I.6). Seven dentists reported their practice location in the following states:

Alaska, Arkansas, Florida, South Carolina, Tennessee, Vermont, and North Carolina.

Two respondents (1.7%) were from Puerto Rico.

Question 16 identified that approximately half of the respondents practice in the four most populated counties in Texas (Table I.7). The largest number of pediatric dentists practice in Harris County (16.2%, n=19) followed by Tarrant (9.4%, n=11), Dallas (9.4%, n=11) and Bexar (8.5%, n=10) Counties.

Survey questions 17 and 18 asked about age (Table I.8) and gender (Table I.9). The smallest group of respondents was less than 30 years old (4.3%, n=5). The largest group of respondents was in the age group of 51-60 (26.5%, n=31). The other age groups reported as follows: 30-40 years (17.1%, n=20), 41-50 years (23.9%, n=28) and over 60 years (25.6%, n=30). There were 57 female (48.7%) and 55 male (47%) participants. One dentist (0.9%, n=1) preferred not to say. Four dentists chose not to respond.

The final demographic survey question 19 asked the dentists to self-describe their personal weight status (Table I.10). The largest group (74.4%, n=87) described their weight status as appropriate. The second largest group (17.1%, n=20) reported being overweight. Two dentists (1.7%) reported being underweight and three respondents (2.6%) preferred not to say.

A bivariate analysis of the entire study population compared each demographic question with the gender of the respondents (Table I.11). The 57 (48.7%) female and 55 (47%) male respondents reported similar characteristics regarding practice location and practice type. The female respondents reported 23.0% (n=27) practice in an urban setting compared to 17.9% (n=21) of the male respondents. A suburban setting is the practice

location for 23.0% (n=27) of the female pediatric dentists compared to 22.2% (n=26) of the male dentists. Private practice is the choice for 43.5% (n=51) of the female dentists and 41.8% (n=49) of the males. Academia is the choice of practice type for 2.5% (n=3) of the female pediatric dentists and 1.7% (n=2) of the male dentists. The characteristic of employment situation found a smaller percentage of female dentists (20.5%, n=24) as sole practitioners compared with male dentists (28.2%, n=33). Female dentists reported a larger percentage as partners (11.1%, n=13) and employees (10.2%, n=12) compared with the male partners (6.8%, n=8) and male employees (4.2%, n=5). Similar results were found among men and women in the number of years in practice except for the last two categories. Male practitioners (9.4%, n=11) reported being in practice for 16-25 years compared to 21.3% of the females (n=25). Male practitioners (23%, n=27) reported being in practice greater than 25 years compared to 10.2% of the females (n=12). Similarly, the age characteristic reported more male dentists over 60 years of age (19.6%, n=23) as compared to females (5.1%, n=6). As expected, the same trend was found with the age characteristic of 51-60 years old as in the 16-25 years of practice characteristic, more women (17.0%, n=20) responded than men (9.4%, n=11). Similar responses between genders were reported in the self-described weight status as having an appropriate weight with males (38.4%, n=45) and females (35.8%, n=42).

3.6 Qualitative Answers

Questions 6-10 gave the opportunity for the respondents to leave additional qualitative responses to each question. Question 6 asked how often specific procedures were performed in the office, of the 117 respondents, 7% (n=9) left additional

comments. Four (3.4%) reported they would refer a child to a pediatrician. Three (2.5%) commented that they only weigh children who need sedation. One dentist reported they would retire soon. One dentist stated that parents get angry when obesity is mentioned. Question 7 asked if the dentist was interested in establishing a protocol in order to advise parents on healthy weight goals. Of those reporting they were not interested (32.5%, n=38) in a healthy weight protocol, (19.6%, n=23) left comments that are summarized in Table I.1. The most common theme among respondents was the feeling that obesity counseling was outside their scope of practice and should be left to the child's primary care physician. Several expressed the sense that parents would not be receptive and might be offended. Time and cost were listed as prohibitive factors.

Question 8 asked the respondents which intervention methods they would consider using in their practice. Four comments were recorded. One practitioner stated a concern regarding payment for the services. One stated obesity is a difficult subject to discuss but they do provide consultation when necessary. Another commented on the unreliability of the BMI as a diagnostic tool. One reported their willingness to discuss and refer children to a nutritionist.

The final question on the survey was an open-ended/qualitative question requesting any additional comment. Of the 117 responding pediatric dentists, 17.9% (n=21) left comments. Table I.12 categorizes the responses. The majority of the respondents who commented left remarks regarding: the importance of the study, the significance of more research on childhood obesity, and the urgency for a reversal in the obesity trends affecting children in their practices.

4. DISCUSSION

According to the literature, this is the only study that has explored pediatric dentists' opinions on the provision of weight-related services in the state of Texas. Specifically, this survey instrument was designed to examine the following issues: attitudes regarding the provision of services targeted to the goals of a healthy weight for child patients ages 0-17, the current delivery of weight-related services provided to children, barriers related to the provision of weight-related services for children, and any factors that might encourage the provision of weight-related services for children. Each section of the survey included the opportunity for respondents to make additional personal comments. Similar studies have been conducted in other states and were used for comparison.

4.1 General Attitudes and Opinions of Texas Pediatric Dentists in Comparison to Current Delivery of Services

Overall, 75.2% (n=88) of Texas pediatric dentists agree they have a significant role in the promotion of a healthy weight for children because of the link between a healthy weight and overall health. Tseng et al. found that the pediatric dental team is uniquely positioned to provide screenings for childhood obesity and offer preventive care and advice regarding the overall health of the child.⁴ Similarly, Braithwaite et al. found 56% (n=57) of North Carolina pediatric dentists agreed that a pediatric dental office is an appropriate place for comprehensive weight-related services.¹⁶ These findings suggest a heightened awareness of the need for an interprofessional

collaboration regarding the epidemic of childhood obesity and the appropriate role of the pediatric dental team. The recommendation is not that pediatric dentists should replace pediatricians or registered dietitians for the provision of weight-related services, but oral health care providers may use dental visits as another source for screening and interventions to address childhood obesity.⁴

This study found that the majority of pediatric dentists in Texas were confident in their abilities to weigh, measure, calculate BMI, and identify children at-risk for obesity. However, the results of this study found the dentists' confidence levels in their abilities differed from their actual delivery of these services. As expected, 89.7% (n=105) felt confident to weigh and measure children; whereas, 79.5% (n=93) weigh children at least once per year and only 35.9% (n=42) measure the height of children. Greater than 57% (n=67) felt effective with the calculation of BMI; yet, only 23% (n=27) provide the service. The majority, 77.8% (n=91) were confident in the ability to identify a child at-risk for obesity; although, 66.6% (n=78) record chart notations if a child shows signs of obesity. In contrast to these findings, Braithwaite et al. found in their 2008 study that 67% (n=68) of North Carolina pediatric dentists did not record weight and 94% (n=95) did not record height measurements routinely.¹⁶ These results represent an available opportunity for the pediatric dental team to compile this data and discuss the findings with parents or caregivers. While many oral health care professionals may find this discussion awkward or uncomfortable, the ethical principles of beneficence and nonmaleficence may be at stake. Tseng et al. concluded that pediatric dentists should be

encouraged to advocate for the best interests of their patients and develop obesity prevention protocols for their practices.⁴

Question 2 asked the dentists to rate their abilities in several areas. The dentists' confidence in their ability declined below 50% in the ability to advise parents about the child's weight (46.1%, n=54), refer children to a weight management specialist (42.8%, n=50), and get parents to follow advice on weight management (3.5%, n=4). The most notable concerns raised by Texas pediatric dentists were all related to perceived parental opinions. Similarly, Wright and Casamassimo found the most notable barriers to the provision of healthy weight interventions to be lack of parental motivation, lack of parental acceptance of advice about weight from the dentist, and fear of appearing judgmental of the parents and children.²⁹ Low levels of agreement were found on question 3 regarding parents' willingness to pay more for weight-related advice (5.1%, n=6), parents' receptiveness for counseling in the dental office (16.3%, n=19) and if parents think it is important for dentists to screen children for obesity (6%, n=7).

Question 4 asked if parents had requested advice related to obesity and finding a healthy weight for their child. The majority responded no (83.8%, n=98). A similar finding was reported in the Wright and Casamassimo study, only 9% (n=110 out of 1218) of the respondents had been asked by parents for healthy weight advice for their children, compared to 85% (n=1039 out of 1222) of the dentists who reported being asked for advice regarding sugar-sweetened beverage intake.²⁹

Interestingly, the 2009 study completed by Tavares and Chomitz found that 95.5% (n=64) of parents/caregivers felt the dental office was a good place to get

information on healthy eating and exercise, 95.5% (n=64) of parents were comfortable having their child weighed at the dental office, 92.5% (n=62) were comfortable receiving their child's weight and BMI results in the dental office and 94% (n=63) thought a dental hygienist was a good person to discuss their child's height and weight goals.¹¹ More research is needed to explore the opinions and attitudes of parents in Texas regarding obesity screening and the provision of weight-related services of their children in the pediatric dental setting. It is quite possible that parents would appreciate conversations that are conducted in a sensitive and optimistic manner. Tseng et al. recommend compassionate, culturally sensitive, and health-focused conversations, which may help to dispel the negative emotions parents and children may exhibit.⁴

In this study, the majority of respondents (81.2%, n=95) agreed with the statement "a dentist who appears physically fit is more credible when providing obesity counseling to parents." The respondents were asked to self-report their weight status with 74.4% (n=87) of Texas pediatric dentists identifying themselves as having an appropriate weight status, 17.1% (n=20) identified as overweight, and 1.7% (n=2) identified as underweight. Braithwaite et al. reported that 89% of the respondents in their 2008 study thought someone who appeared physically fit would be more credible when providing weight-related counseling. Likewise, 87% thought a provider who appeared physically unfit would be less credible.¹⁶ Curran et al. found that many participants, in their 2010 study, commented that they were overweight themselves and feared not being credible.¹⁹

Over 80% (n=94) of the respondents report they would be interested in advising parents about weight management if there was a link between obesity and oral health. Similar findings also appear in studies conducted over the last decade.^{17,19-20} In 2012, Lee et al. compared the practice characteristics of pediatric dentists who provide caries-related counseling (69%, n=1,227) to those who provide weight-related counseling (9%, n=153) and found that 32% of those offering caries-related counseling would not consider offering weight-related counseling until a link between oral health and obesity is determined.¹⁷ Curran et al. found a similar response with their 2010 national survey, approximately 40% of respondents surveyed reported they would not consider the provision of weight-related services until a link was found; however, 82% reported that dentists would be more likely to provide weight-related services if obesity were definitively linked to oral disease.¹⁹ In comparison, Wright and Casamassimo found that a definitive link between obesity and oral disease would significantly encourage 88% of the pediatric dentists to consider weight-related services.²⁹ While a clear, direct relationship between obesity and oral disease has not been established, the harmful effects of obesity on overall health cannot be ignored. Oral health care providers should be encouraged to closely monitor emerging research on the link between oral health and obesity. Curran et al. concluded that dental educators should develop obesity-related intervention protocols and obesity risk assessment tools to implement into dental school curricula and courses.¹⁹

Due to the use of local anesthesia and/or sedation in many pediatric dental practices, vital sign monitoring, anthropometric measurements, and chart notations are

required by the Texas State Board of Dental Examiners. As seen in Figure H.1, the majority of respondents report the provision of these services to some degree. The majority do not report the calculation of BMI, screening for Acanthosis Nigricans, speaking to the parents about obesity, providing obesity-related materials or offering follow-up interventions that could result from data acquired from the required screening procedures. This is understandable due to the perceived concerns of offending the parents. Similar findings have been reported in previous studies.^{4,16,17,19-21}

Tseng, et al. concluded that the pediatric dental office is well equipped to record BMI scores and then provide valuable longitudinal data due to the frequency of recare appointments.⁴ Braithwaite et al. found that pediatric dentists who received nutritional training during their residency training were more likely to positively affect the childhood obesity epidemic.¹⁶ Kading et al. surveyed North Carolina dental hygienists and found that 95% (n=234) felt hygienists have a role in helping patients with nutrition, but only 65% (n=160) felt confident to discuss the health-related risks of obesity. Similarly, Cole et al. conducted a random sample of members of the American Dental Hygienists' Association (ADHA) and found 96% (n=880) provide nutritional counseling at least some of the time; however, 85% (n=776) cited a lack of confidence to address obesity as a barrier.²¹ Many of these concerns may be addressed by CE courses offered to both pediatric dentists and hygienists, and by advocacy and leadership in the dental community.¹⁶

Question 5 asked if the dentists were currently offering childhood obesity information to their patients or if there was interest in offering healthy weight

interventions in their practice. The majority responded favorably at 60.7% (n=71) with 32.5% (n=38) responding no. It was interesting to note that all dentists who work in academia, hospital, and public health practice settings responded yes. Those dentists who were not interested in a protocol were given the opportunity to comment. As seen in Table I.1, those comments included: should be addressed by the pediatrician, parents are not receptive, parents do not want to pay for this service, the dentist does not have time and the dentists would feel hypocritical because they are overweight.

Question 7 in this section asked the dentists to rate which interventions they would consider using. As seen in Figure H.2, the majority of dentists are willing to weigh children, calculate BMI, obtain blood pressure, provide educational materials, make chart notations, talk to parents and offer a referral. Almost half are willing to screen for Acanthosis Nigricans. And less than half are willing to measure children's height, provide a screening tool, offer dietary counseling, offer behavior modification programs or provide a follow-up protocol.

4.2 Barriers to the Provision of Services

Pediatric dentists work closely with the parents of their patients; therefore, it is very important to establish a strong sense of trust and respect between dentist, parent, and child. Interestingly, as seen in Figure H.3, the major barriers to the provision of obesity-related services were all parent related. A lack of parental motivation and a lack of parental acceptance were the most widely chosen major barriers to the provision of services. Fear of offending the parents, appearing judgmental, and creating parent dissatisfaction were also chosen by a majority of the Texas pediatric dentists as major

barriers. Interestingly, the lack of additional fees charged to the patients, the lack of 3rd party payer reimbursement, and the concern over legal risks did not present as major barriers. A survey of Texas parents would be beneficial in order to determine if the perceived major barriers are accurate. As found in the Tavares et al. study, a large majority of parents and caregivers were open to the provision of obesity education and found the interventions helpful.¹¹

In this study, minor barriers to the provision of services included: lack of trained personnel to perform these services, lack of time in the daily schedule, lack of knowledge of how to start the conversation. Cole et al. found similar results in their recent 2018 national survey of dental hygienists. It was reported that while dental hygienists (99%, n=910) understand the risk of obesity and overall health, the participants stated the barriers to the provision of weight-related services: as lack of time in the daily schedule, fear of offending the patient and parents, and a lack of confidence to address obesity issues.²¹ Approximately half (51%, n=459) of the dental hygienists surveyed reported nutrition education as part of their dental hygiene education. This was alarming, as it is required in the curriculum of every CODA accredited dental hygiene program.²¹ Several studies reveal that both dentists and dental hygienists report a lack of training on obesity.^{16-17,19-21} Kading et al. concluded that hygienists should stay engaged in research and monitor emerging research on the links between obesity and oral health so as to promote an increase in knowledge and confidence in the provision of obesity services.²⁰

4.3 Incentives to the Provision of Services and Information

As seen in Figure H.4, the majority of survey participants reported they would be encouraged to provide obesity-related interventions by incentives that promote more education. The availability of more CE courses on childhood obesity for both dentists (70.1%, n=82) and their staff (63.2%, n=74) could help to promote confidence to start the conversation with parents in a non-judgmental, culturally competent manner. Continuing education courses could help outline ways to relate the findings in a manner that takes very little time and required little or no payment. Braithwaite et al. found a similar finding in their 2008 study in which respondents (69%, n=70) stated an interest in nutrition and healthy lifestyle CE courses¹⁶.

In this study, respondents (67.5%, n=78.9) reported that clear guidelines for the implementation of obesity services would be an incentive to provide these services. The adoption of clear, concise guidelines on diet, nutrition, and obesity specifically for children may help give providers the tools needed to discuss their findings with parents. The development of culturally sensitive patient education materials on childhood obesity is needed. The awareness of referral options available in local communities would aid dentists in their ability to make appropriate recommendations to the parents of their patients. A well-coordinated effort in the dental and healthcare communities could develop these options for the best interest of our child patients.

As seen in Figure H.4, it was interesting that less than half of the participants in this study stated that increased marketing opportunities, parents willing to pay additional

fees, and greater patient satisfaction within the practice would motivate them to provide obesity-related services.

4.4 Qualitative Answers

The open-ended questions in the study allowed the respondents to freely give their opinions regarding their experiences treating children who may be overweight or obese. The most common theme was a concern about the scope of practice and whether it is a dentist's responsibility to counsel their patients regarding obesity. Many expressed a reasonable concern about the need to not offend parents and their children. Parents may take the dentist's recommendations as judgment of their ability to properly care for their children. One Texas pediatric dentist stated that some parents are overwhelmed with information and may not seem interested in hearing about nutritional counseling from the dentist.

Another significant theme was the question of who would pay for these services. Overall, the respondents did not report reimbursement issues as a significant barrier to the provision of weight-related services. However, three dentists commented that parents do not want to pay for necessary dental services, much less, nutritional counseling. It was reported that Medicaid and insurance benefits are small and may not cover nutritional counseling in the dental setting. Curran et al. explored the attitudes of general dentists compared to pediatric dentists and found that pediatric dentists were less likely to report reimbursement issues as a barrier to the provision of obesity-related services.¹⁹ A similar theme was found regarding appointment times. Overall, only 31.6% (n=37) of the dentists in this study reported time constraints in the appointment schedule as a

major barrier. However, two pediatric dentists described their time with their patient as too short to include nutritional counseling or referral.

Many respondents wrote encouraging words regarding the study and added that there is a significant need to develop interprofessional education in order to help address the childhood obesity trend.

4.5 Limitations

One limitation of this study was the lack of data regarding the ethnicity of the respondents. Previous studies looked at the role of ethnicity and gender and found that these two factors played a role in the provision of weight-related services.^{16-17,19-21} Lee et al. found that Hispanic female pediatric dentists were more likely to offer weight-related counseling to their child patients.¹⁷ Curran et al. found a similar dynamic; overall, respondents who were female, Hispanic, younger than 36 years, pediatric specialists as opposed to general dentists, and were employees of their practices were more interested in providing obesity-related services to patients.¹⁹ The respondents in this study were nearly equally represented by males and females and gender did not present a bias; however, ethnicity might have presented an interesting data point. Future research should consider the role of race and gender in the provision of obesity-related services.

Another possible limitation of this study was the timing of the mailing of the paper survey. This survey was initially mailed out on September 25, 2017. The number of respondents from the coastal area of Texas may have been affected due to Hurricane Harvey, which made landfall on August 25, 2017. Three respondents from Puerto Rico apologized for a delayed response and reported no mail service due to the landfall and

destruction caused by Hurricane Maria on September 20, 2017. If it had been possible to obtain email addresses from the TSBDE or another source, there may have been a higher participation rate with an electronic survey.

4.6 Future Research

Future research on this subject could include the survey of Texas dental hygienists' attitudes, opinions, and practices regarding child patients with obesity. Many children receive a dental prophylaxis by a dental hygienist every six months and may only see the dentist one time per year for an exam. This frequency of recare appointments allows for a relationship of trust to form between the hygienist and the patient. Dental hygienists are required to take a nutrition course as part of the curriculum required for graduation from a CODA accredited school. The ADEA Compendium of Curriculum Guidelines for Allied Dental Education Programs lists primary educational goals for each of the required courses in the dental hygiene curriculum. One of the primary goals listed for the required nutrition course is the demonstration and implementation of effective approaches to dietary assessment and nutrition counseling.³¹ Therefore, it would be valid to survey Texas dental hygienists and determine their attitudes and willingness to provide nutritional counseling services to their patients.

Another viable study would be to survey parents and caregivers who bring their children for dental visits. Due to the understandable concerns reported by Texas pediatric dentists regarding their perceptions of parental attitudes, it may be valuable to determine if parents would be receptive to receiving weight-related services and nutritional counseling from the oral health care providers.

Research and development of an objective obesity-screening assessment tool similar to the Caries Management by Risk Assessment (CAMBRA) could be useful to dentists and their patients. Reporting the objective scores of an evidence-based assessment tool may help to reduce the uncomfortable feelings when discussing a child's weight issues and bridge the conversation to nutritional counseling and/or referral to a registered dietician. An obesity assessment tool may be a useful conversation starter for oral health care providers to use with both children and their parents.

5. CONCLUSION

This study found the majority of Texas pediatric dentists report the routine performance of many of the procedures used to screen for obesity; and, they are confident in their effectiveness to perform these screening procedures. Texas pediatric dentists agree that dentists have a role in helping children achieve a healthy weight because of the importance of weight to overall health. However, the results indicate there are still gaps in the current delivery of services in the pediatric dental setting that specifically address identification and prevention of childhood obesity. Dental professionals should be encouraged to take the results of the obesity-screening procedures that are widely used in pediatric dental offices and discuss their findings with the parents or caregivers of their patients, provide interventions, and refer their patients to appropriate providers.

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APPENDIX A

SURVEY

Consent Form

Project Title: Screening practices and interventions by pediatric dentists in Texas to address childhood obesity.

Primary Investigators: Tammy Fisher RDH BS, Lisa Mallonee MPH, Patricia Campbell MS, Dr. Alton McWhorter, and Dr. Qian Wang.

Purpose: You are being asked to participate in a research study to discover your opinions and practices regarding childhood obesity.

Procedures: As a participant in this study, you will be asked to complete a paper survey. It should take you no longer than 15 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. However, your participation will aid in our understanding of potential roles that dental professionals can play in encouraging healthy nutrition and promoting healthy weight in Texas children.

Confidentiality: Information about you will be kept confidential to the extent permitted or required by law. We are not recording any demographic information that could identify you. People who have access to your information include the study investigators. They are required to maintain confidentiality regarding subject pools.

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.

Contact Person: Any questions about this study may be directed to Tammy Fisher via email at tfisher@tamu.edu.

1. 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.

General Attitudes and Opinions

The investigators want to know about your attitudes, interests, and experiences in terms of providing information to parents and services to your child patients about obesity. Thank you in advance for your contribution to research that can help encourage healthy weight and healthy smiles in children.

To begin, we would like to know your attitudes regarding the provision of information or interventions targeted to the goals of a healthy weight for child patients ages 0-17.

2. Rate how effective you feel you are in your ability to:

| | Very Effective | Effective | Neither Effective nor Ineffective | Ineffective | Very Ineffective |
|-------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------------------|-----------------------|-----------------------|
| Weigh children and measure their height | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Calculate and interpret a body mass index (BMI) score for children ages 2 and older | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Identify a child patient at risk for obesity | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Give parents advice about their child's weight | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Refer a child to a specialist to help with weight management | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Get parents to follow advice on weight management | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

3. Rate your opinions of the following statements:

| | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------------------------|
| Dentists have a role in helping children achieve a healthy weight because of the importance of weight to general health | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I am willing to discuss childhood obesity concerns without parents initiating the conversation for a child patient who would benefit from the effort | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| If a link between obesity and oral health status is determined, I would be interested in advising parents about weight management for their children | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Parents are willing to pay more for a dental visit that includes advice about consumption of sugar-sweetened beverages | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| A dentist who appears physically fit is more credible when providing obesity counseling to parents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Parents are receptive to obesity counseling in the dental office | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Parents think it is important for dentists to screen children for obesity | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| If a dentist provides screening for obesity, parents will consider the dentist more professional/ knowledgeable | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Parents are willing to pay more for a dental visit that includes childhood obesity screening | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

4. Have parents asked you for advice about obesity and maintaining a healthy weight for their child?

| | |
|-----------------------|-----------------------|
| Yes | No |
| <input type="radio"/> | <input type="radio"/> |

Your Current Delivery and Services

This section of the survey asks about any services performed in your office, such as providing information or counseling, with the goal of helping patients ages 0-17 achieve a healthy weight.

5. Are you currently offering childhood obesity information or other healthy weight interventions for patients?

| Yes | No |
|-----------------------|-----------------------|
| <input type="radio"/> | <input type="radio"/> |

6. Please indicate how often the following is performed in your office:

| | At every visit | One time per year | Never |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|
| I weigh children | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I measure children's height | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I calculate and interpret a Body Mass Index (BMI) score for children ages 2 and older | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I obtain and record children's blood pressure | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I screen for Acanthosis Nigricans on the necks of children during the Extra-Oral exam | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| My practice provides educational materials on childhood obesity | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| If a child shows signs of being overweight or obese, I note it in the chart | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| If a child shows signs of being overweight or obese, I talk to parents about my observations | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| If a child shows signs of being overweight or obese, parents are offered motivational interviewing or another behavior-modification program | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Parents are provided a self administered screening tool for childhood obesity | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Obesity information and other interventions are followed up with additional communication, such as phone calls, text messages, or emails | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Other (please specify):



7. Are you interested in establishing a protocol to advise parents on healthy weight goals?

| Yes | No | Not applicable, I do provide them |
|-----------------------|-----------------------|-----------------------------------|
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

If no, please provide an explanation as to why you are not interested:

8. Which of the following intervention methods would you consider using? (Mark all that apply.)

- Weigh children
- Measure the height of children
- Calculate and interpret a BMI score for children ages 2 and older
- Obtain and record Blood Pressure
- Screen for Acanthosis Nigricans
- Provide educational materials on childhood obesity
- Provide parents with a self-administered screening tool for childhood obesity
- Note signs of being overweight or obese in the child's chart
- Talk to parents about observations if a child shows signs of being overweight or obese
- Offer weight-related dietary counseling
- Offer weight-related motivational interviewing or other behavior-modification programs
- Offer a referral for children identified as overweight or obese
- Follow up weight counseling and other interventions with additional communication, such as: phone calls, text messages, or emails

Other (please specify):

Barriers to Providing Information and Services

We are interested in barriers you face in your office related to the provision of interventions with the goal of helping parents achieve a healthy weight for child patients ages 0–17.

9. Below are potential barriers to offering information or other services about obesity and weight management to parents of child patients. Please indicate whether you perceive the following as a major barrier, minor barrier or not a barrier to offering this service. A barrier is any factor that prevents the performance of a behavior. A major barrier has considerable influence on your actions; a minor barrier has little influence on your behavior.

| | Major barrier | Minor barrier | Not a barrier |
|--------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|
| Fear of offending the parent | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Fear of appearing judgmental of parents and/or child patients | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Lack of parental acceptance of advice about weight management from a dentist | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| May be seen by state dental board as practicing medicine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| May create parent dissatisfaction with my practice | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Lack of trained personnel in my office to perform this service | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Lack of personal knowledge or training about childhood obesity | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Lack of time in the daily clinical schedule | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Lack of parental motivation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| No additional fees charged to parents for the additional services | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Lack of reimbursement from 3rd-party payers | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Dietary recommendations about childhood obesity are ambiguous and/or confusing | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| | | | |
|--------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
| Concern over legal risks | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Lack of appropriate referral options | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Lack of knowledge about how to start the conversation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | Major Barrier | Minor Barrier | Not a Barrier |
| Lack of training in communication skills | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Lack of available patient education materials on childhood obesity | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Low income level of parents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Low educational level of parents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (please specify): | | | |
| | | | |

Incentives to Providing Information and Services

We are interested in any factors that might encourage you to provide information or other interventions related to obesity and achieving a healthy weight for child patients ages 0 – 17.

10. Which of the following factors would encourage you to provide information or other interventions related to childhood obesity issues with parents? (Please check all that apply.)

- More continuing education courses on childhood obesity for dentists
- More continuing education courses on childhood obesity for dental staff
- More approaches that add little or no time to a dental visit
- More parents asking for information about childhood obesity and healthy weight counseling
- Increased parent willingness to pay additional fees for the service

- Increased reimbursement from 3rd-party payers
- Clear clinical guidelines on diet, nutrition, and obesity
- Stronger clinical evidence of a link between childhood obesity and dental disease
- Increased availability of appropriate referral options
- Increased availability of patient education materials on childhood obesity
- Increased opportunity to market my practice
- Greater parent satisfaction with my practice
- Increased credibility/professionalism in the opinion of parents

Other (please specify):

Demographics

11. Practice location

- Urban
- Suburban
- Rural

12. Practice type

- Private practice
- Academia/research
- Public health/community clinic
- Hospital-based clinic
- Government
- Corporate
- Other (please specify):

13. Current employment situation

- Sole proprietor – the only owner
- Partner – two or more owners
- Employee
- Independent contractor
- Not working at this time
- Other (please specify):

14. Number of years practicing pediatric dentistry

- 5 years or less
- 6-10 years
- 11-15 years
- 16-25 years
- More than 25 years

15. In what state or U.S. territory do you practice? (Please choose only one answer; the state or territory you practice in most.)

16. In what Texas County do you practice?

17. Age

- Under 30 years old
- 30 - 40 years old
- 41 - 50 years old
- 51 - 60 years old
- Over 60 years old

18. Gender

- Female
- Male
- Prefer not to say

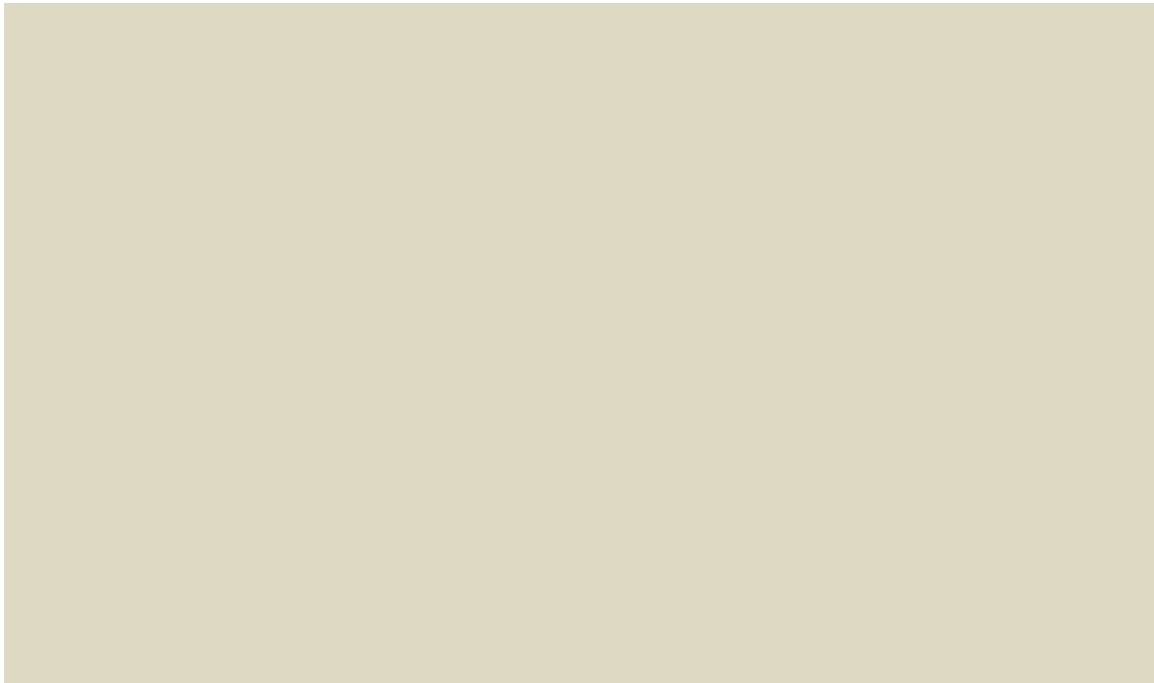
19. Self-described weight status

- Overweight
- Appropriate weight
- Underweight
- Prefer not to say

Thank you!

Thank you for your time and insights on these topics that are crucial to the health of children.

20. We welcome any comments you would like to provide in the space below.



APPENDIX B

PILOT TEST SURVEY QUESTIONNAIRE

1. How long did it take you to complete the survey?
2. Was the survey easy to read and follow through to the end?
3. Do you prefer a paper or electronic survey?
4. Is the question sequence logical?
5. Are there any improvements you would suggest?
6. Is there any other area related to this topic that needs to be questioned?

Thank you very much for your participation!

Tammy Fisher, RDH BS

APPENDIX C
RESEARCH TIMELINE

| | Task | Time Required |
|-----|-----------------------------------------------------|-----------------------------|
| 1. | Literature Review | Complete |
| 2. | Proposal approval by Committee and IRB | 4-6 weeks |
| 3. | Adapt survey and questionnaire | 1 week |
| 4. | Survey reviewed by faculty | 1 week |
| 5. | Modify survey with suggestions from faculty | 1 week |
| 6. | Design cover letter | 1 day |
| 7. | Pilot test survey and questionnaire | 1 day |
| 8. | Modify survey with suggestions from residents | 1 week |
| 9. | Design database | 2 weeks |
| 10. | Prepare initial survey for mailing | 1 week |
| 11. | Administer surveys/Wait for response | 4 weeks |
| 12. | Administer second mailing/Wait for response | 4 weeks |
| 13. | Enter data into SPSS | 4-6 weeks as surveys return |
| 14. | Analyze data in SPSS | 4 weeks |
| 15. | Write results, discussion, and conclusion of thesis | 4-6 weeks |
| 16. | Thesis defense | 1 week |
| 17. | Submit final thesis draft | 1 week |

APPENDIX D

BUDGET

| | |
|---------------------------------------------------------------|-----------|
| Printing of 600 surveys and 500 second letters | \$327.50 |
| Postage for initial mailing and return envelopes (1100 x .70) | \$770.00 |
| Printing and 1100 envelopes for first mailing | \$279.50 |
| Postage for second mailing | \$225.40 |
| Envelopes and labels for second mailing | \$37.88 |
| Total | \$1640.28 |

APPENDIX E

IRB APPROVAL LETTER

DIVISION OF RESEARCH



July 21, 2017

EXEMPTION DETERMINATION

| | |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type of Review: | Submission Response for Initial Review Submission Form |
| Title: | Screening Practices and Interventions of Pediatric Dentists in Texas to Address Childhood Obesity |
| Investigator: | Lisa Mallonee |
| IRB ID: | 2017-0476-CD-EXM |
| Reference Number: | 055507 |
| Funding: | Office of Academic Affairs, Texas A&M University College of Dentistry |
| Documents Reviewed: | IRB Application v. 1.0 Recruitment Letter 2nd Request v. 3.2 Recruitment Letter 1st Request v. 3.2 Recruitment Consent Form v. 3.2 Survey/Questionnaire v. 3.2 |
| Special Determinations: | N/A |
| Risk Level of Study: | Not Greater than Minimal Risk under 45 CFR 46 / 21 CFR 56 |

Dear Lisa Mallonee:

The HRPP determined on 07/21/2017 that this research meets the criteria for Exemption in accordance with 45 CFR 46.101(b) under Category 1: Research conducted in established or commonly accepted educational settings, involving normal educational practices. Category 2: Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior unless, the information is obtained in an identifiable manner and any disclosure of the subject's responses outside of research could reasonably place the subject at risk.

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 submit a continuing review form through iRIS.

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

Sincerely,

750 Agronomy Road, Suite 2701
1186 TAMU
College Station, TX 77843-1186
Tel. 979.458.1467 Fax. 979.862.3176
<http://rcb.tamu.edu>

IRB Administration

APPENDIX F

INTRODUCTION LETTER

July 1, 2017

Dear Doctor:

My name is Tammy Fisher and I am a graduate student in an interprofessional degree program at Texas A&M University. A requirement for completion of my Masters degree includes a thesis that relates to my field of study. I am conducting a research study at the Texas A&M College of Dentistry in Dallas to investigate the current screening procedures for childhood obesity by pediatric dentists in Texas.

The American Academy of Pediatric Dentistry, the American Dental Association, the American Dental Hygienists' Association, the Oral Health Resource Center and the Santa Fe Group have formed an alliance in order to engage oral health professionals in reducing childhood obesity. This survey will attempt to discover pediatric dentists' practices and opinions regarding the provision of healthy weight services for children, as well as, investigate barriers and incentives for the provision of these services.

You have been selected from a list of currently active licensed pediatric dentists from the Texas State Board of Dental Examiners. I would like to invite you to participate in my research. As a pediatric dentist, your knowledge and opinions are valuable to my study. This survey has been adapted by permission from Dr. Robin Wright and the Pediatric Oral Health Research and Policy Center of the American Academy of Pediatric Dentistry. This survey has been approved by the Texas A&M University College of Dentistry Institutional Review Board (IRB # 2017-0476-CD-EXM). The questionnaire should take about 15 minutes to complete and enclosed is a self-addressed, stamped envelope for you to return with the survey. You will be giving your informed consent by completing and returning the survey. Please return the survey by _____.

Your responses will be kept confidential. Each survey is coded with an identification number and will be used for data analysis and secondary follow-up, if necessary. 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. There will be no direct benefit to you by your participation in this research study; however, your participation will aid in our understanding of potential roles that dental professionals can play in encouraging healthy nutrition and promoting healthy weight in Texas children.

If you have any questions or comments about the project, I can be reached at tfisher@tamu.edu. If you have any questions concerning your rights as a research participant, or if you have any complaints or concerns about the research, you may call the Texas A&M University Human Subjects Program Office at 1-979-458-4067 or contact by email at irb@tamu.edu.

Thank you for your participation in this important study.

Sincerely,

Tammy Fisher RDH, BS
Candidate for MS-EDHP
Texas A&M University
College of Medicine
Texas A&M Health Science Center

Lisa Mallonee BSDH, MPH, RD (Thesis Chair)
Professor and Graduate Program Director
Texas A&M University
College of Dentistry
Texas A&M Health Science Center

APPENDIX G
SECOND LETTER

August 1, 2017

Dear Doctor:

My name is Tammy Fisher and I am a graduate student in an interprofessional degree program at Texas A&M University. A requirement for completion of my Masters degree includes a thesis that relates to my field of study. Last month you were invited to participate in research I am conducting at the Texas A&M College of Dentistry in Dallas. A survey was mailed to you in an attempt to discover pediatric dentists' practices and opinions regarding the provision of healthy weight services for children, as well as, investigate barriers and incentives to the provision of services.

If you have already completed and returned the survey, please accept my sincere thanks. If not, please complete and return the survey today. The survey should take approximately 15 minutes of your time. The survey has been approved by the Texas A&M University College of Dentistry Institutional Review Board (IRB # 2017-0476-CD-EXM). You are giving your informed consent by completing and returning the survey. If you should need a replacement survey or additional information, please contact me immediately at tfisher@tamu.edu, and I will provide another survey. Your responses will be kept confidential.

Your response is very important to my study. Please return the survey by _____. If you have any questions or concerns about the study, you may contact me anytime at tfisher@tamu.edu. If you have any questions concerning your rights as a participant, or if you have any complaints or concerns about the research, you may call the Texas A&M University Human Subjects Program Office at 1-979-458-4067 or contact by email at irb@tamu.edu.

Sincerely,

Tammy Fisher RDH, BS
Candidate for MS-EDHP
Texas A&M University
College of Medicine
Texas A&M Health Science Center

Lisa Mallonee BSDH, MPH, RD (Thesis Chair)
Professor and Graduate Program Director
Texas A&M University
College of Dentistry
Texas A&M Health Science Center

APPENDIX H

RESULTS FIGURES

Figure H.1: Current delivery of weight related services by Texas pediatric dentists

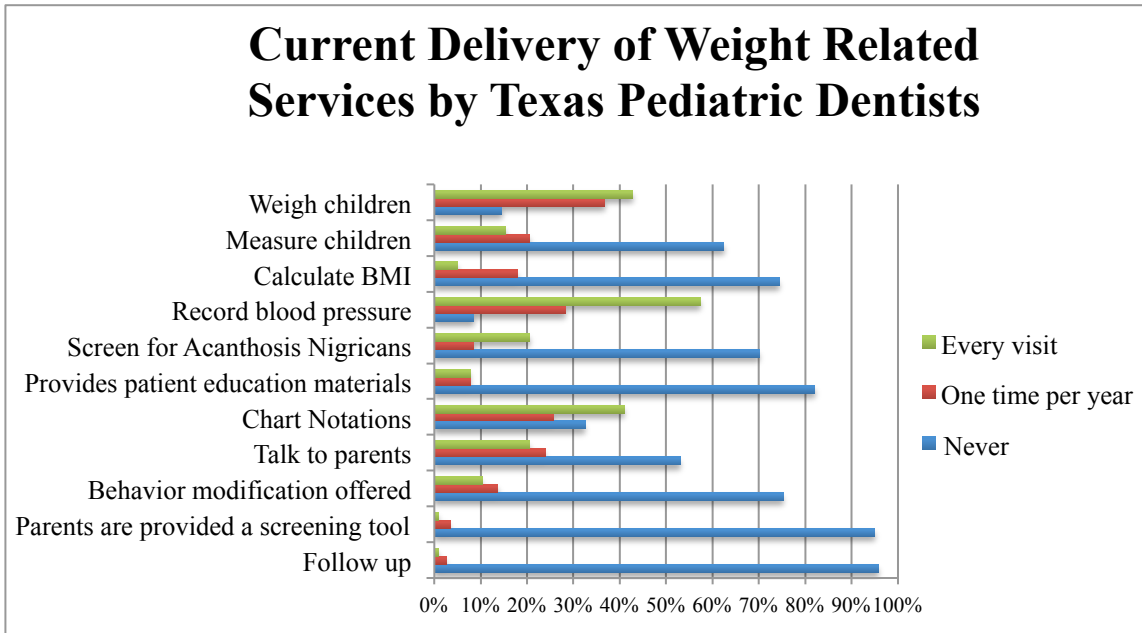


Figure H.1 Percentages of Texas pediatric dentists who perform these weight related services

Figure H.2: Weight related procedures Texas pediatric dentists are willing to perform

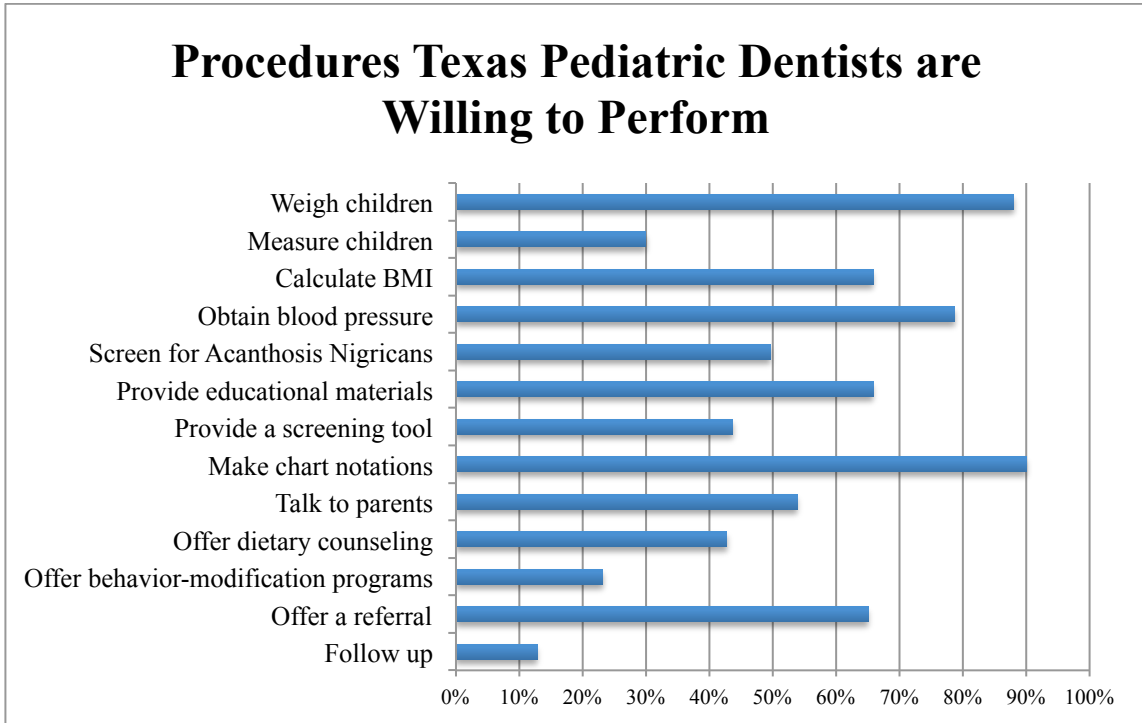


Figure H.2 Percentages of Texas pediatric dentists willing to perform these procedures.

Figure H.3: Perceived major barriers to Texas pediatric dentists

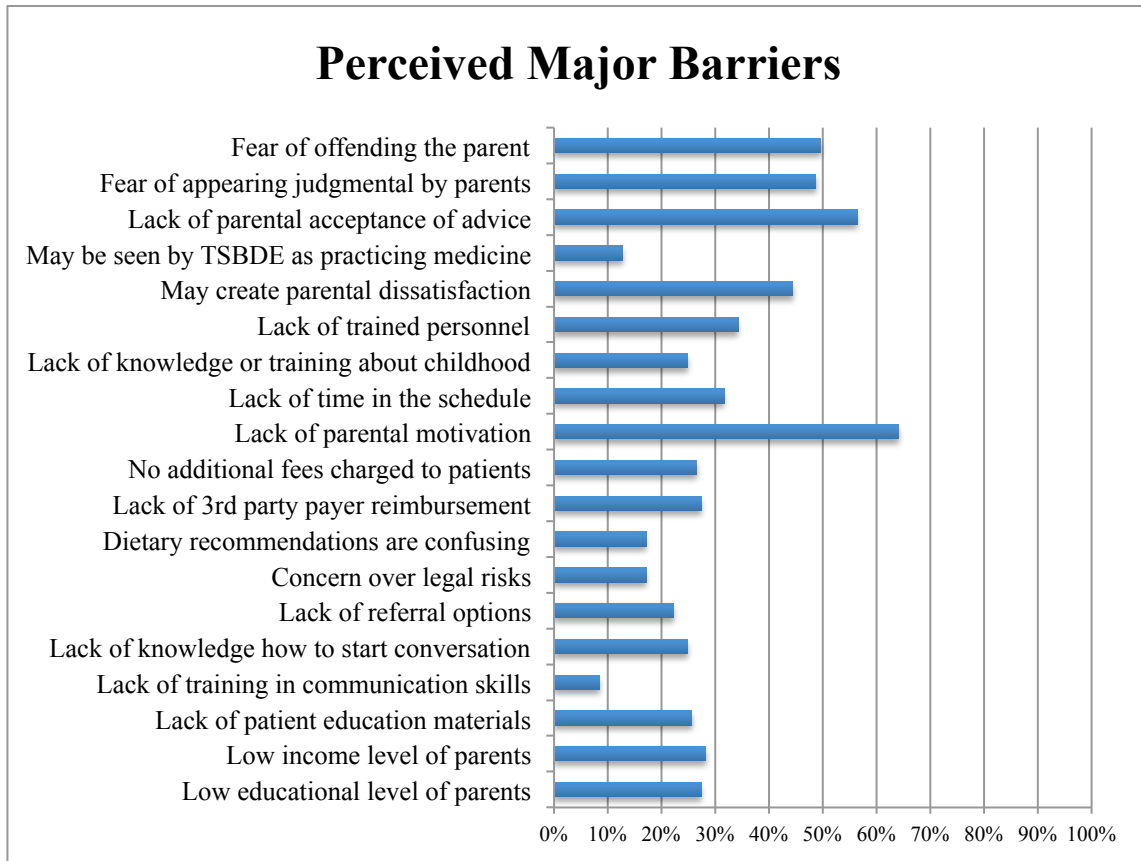


Figure H.3 Percentages of Texas pediatric dentists that consider these statements as major barriers to the provision of obesity related services.

Figure H.4: Incentives to the provision of weight related information and services

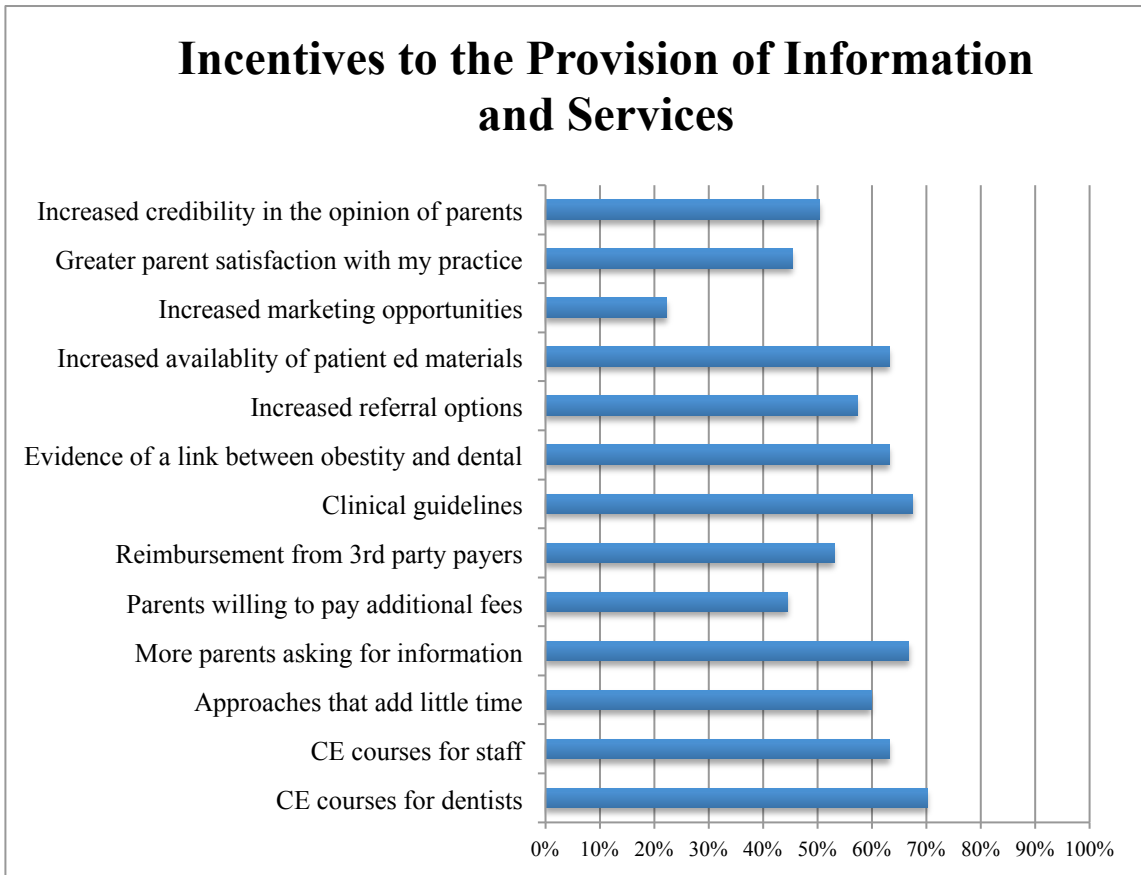


Figure H.4 Percentages of Texas dentists that consider these statements as an incentive to the provision of obesity related services.

APPENDIX I

RESULTS TABLES

Table I.1: Qualitative comments Question 7

| | |
|------------------------------------------------------------|----|
| Should be addressed by pediatrician/primary care physician | 13 |
| Parents are not receptive | 8 |
| Parents do not want to pay for this service | 3 |
| Dentist does not have time | 2 |
| The dentist would feel hypocritical | 1 |

Demographics

Table I.2: Practice location

| Location | Absolute | Relative |
|-----------------|-----------------|-----------------|
| No response | 4 | 3.4% |
| Urban | 49 | 41.9% |
| Suburban | 54 | 46.2% |
| Rural | 10 | 8.5% |
| Total | 117 | 100% |

Table I.3: Practice type

| Practice Type | Absolute | Relative |
|----------------------|-----------------|-----------------|
| No response | 4 | 3.4% |
| Private Practice | 102 | 87.2% |
| Academia | 5 | 4.3% |
| Public Health | 1 | 0.9% |
| Hospital Based | 1 | 0.9% |
| Government | 0 | 0.0% |
| Corporate | 4 | 3.4% |
| Other | 0 | 0.0% |
| Total | 117 | 100% |

Table I.4: Current employment status

| Employment Status | Absolute | Relative |
|--------------------------|-----------------|-----------------|
| No Response | 3 | 2.6% |
| Sole Proprietor | 58 | 49.6% |
| Partner | 21 | 17.9% |
| Employee | 19 | 16.2% |
| Independent Contractor | 14 | 12.0% |
| Not working | 1 | 0.9% |
| Other | 1 | 0.9% |
| Total | 117 | 100% |

Table I.5: Number of years practicing pediatric dentistry

| Years | Absolute | Relative |
|-----------------|-----------------|-----------------|
| No response | 3 | 2.6% |
| 5 years or less | 11 | 9.4% |
| 6-10 years | 12 | 10.3% |
| 11-15 years | 15 | 12.8% |
| 16-25 years | 36 | 30.8% |
| >25 years | 40 | 34.2% |
| Total | 117 | 100% |

Table I.6: In what state or US territory do you practice?

| State | Absolute | Relative |
|--------------|-----------------|-----------------|
| AK | 1 | 0.9% |
| AR | 1 | 0.9% |
| FL | 1 | 0.9% |
| NC | 1 | 0.9% |
| Puerto Rico | 2 | 1.7% |
| SC | 1 | 0.9% |
| TN | 1 | 0.9% |
| TX | 105 | 89.7% |
| VT | 1 | 0.9% |
| No response | 3 | 2.6% |
| Total | 117 | 100% |

Table I.7: In what Texas County do you practice?

| County | Absolute | Relative |
|---------------|-----------------|-----------------|
| Angelina | 1 | 0.9% |
| Bastrop | 1 | 0.9% |
| Bell | 3 | 2.6% |
| Bexar | 10 | 8.5% |
| Brazos | 2 | 1.7% |
| Collin | 8 | 6.8% |
| Comal | 1 | 0.9% |
| Dallas | 11 | 9.4% |
| Denton | 4 | 3.4% |
| El Paso | 3 | 2.6% |
| Fayette | 1 | 0.9% |
| Fort Bend | 4 | 3.4% |
| Greg | 1 | 0.9% |
| Guadalupe | 1 | 0.9% |
| Harris | 19 | 16.2% |
| Hidalgo | 1 | 0.9% |
| Hood | 1 | 0.9% |
| Jefferson | 1 | 0.9% |
| McLennan | 2 | 1.7% |
| Montgomery | 3 | 2.6% |
| Nueces | 2 | 1.7% |
| Potter | 1 | 0.9% |
| Randall | 3 | 2.6% |
| Smith | 1 | 0.9% |
| Tarrant | 11 | 9.4% |
| Travis | 2 | 1.7% |
| Uvalde | 1 | 0.9% |
| Val Verde | 1 | 0.9% |
| Victoria | 1 | 0.9% |
| Walker | 1 | 0.9% |
| Webb | 1 | 0.9% |
| Wichita | 1 | 0.9% |
| Williamson | 1 | 0.9% |
| N/A | 9 | 7.7% |
| No response | 3 | 2.6% |
| Total | 117 | 100% |

Table I.8: Age of respondents

| Age | Absolute | Relative |
|---------------|-----------------|-----------------|
| No response | 3 | 2.6% |
| Under 30 | 5 | 4.3% |
| 30-40 years | 20 | 17.1% |
| 41-50 years | 28 | 23.9% |
| 51-60 years | 31 | 26.5% |
| Over 60 years | 30 | 25.6% |
| Total | 117 | 100% |

Table I.9: Sex of respondents

| Gender | Absolute | Relative |
|-------------------|-----------------|-----------------|
| No response | 4 | 3.4% |
| Female | 57 | 48.7% |
| Male | 55 | 47% |
| Prefer not to say | 1 | 0.9% |
| Total | 117 | 100% |

Table I.10: Self-described weight status of respondents

| Weight Status | Absolute | Relative |
|----------------------|-----------------|-----------------|
| No response | 5 | 4.3% |
| Overweight | 20 | 17.1% |
| Appropriate | 87 | 74.4% |
| Underweight | 2 | 1.7% |
| Prefer not to say | 3 | 2.6% |
| Total | 117 | 100% |

Table I.11 Demographics of study population (n=117)

| Characteristic | Female Pediatric Dentists (n=57) | | Male Pediatric Dentists (n=55) | |
|-------------------------------------|-------------------------------------|-----------|-----------------------------------|-----------|
| | Absolute | Frequency | Absolute | Frequency |
| Practice Location | | | | |
| No response | 1 | 0.9% | 1 | 0.9% |
| Urban | 27 | 23.0% | 21 | 17.9% |
| Suburban | 27 | 23.0% | 26 | 22.2% |
| Rural | 2 | 1.7% | 7 | 5.9% |
| Practice Type | | | | |
| No response | 1 | 0.9% | 1 | 0.9% |
| Private | 51 | 43.5% | 49 | 41.8% |
| Academia | 3 | 2.5% | 2 | 1.7% |
| Public Health | 0 | 0.0% | 1 | 0.9% |
| Hospital | 1 | 0.9% | 0 | 0.0% |
| Government | 0 | 0.0% | 0 | 0.0% |
| Corporate | 1 | 0.9% | 2 | 1.7% |
| Employment Situation | | | | |
| No response | 0 | 0.0% | 1 | 0.9% |
| Sole Practitioner | 24 | 20.5% | 33 | 28.2% |
| Partner | 13 | 11.1% | 8 | 6.8% |
| Employee | 12 | 10.2% | 5 | 4.2% |
| Independent | 8 | 6.8% | 6 | 5.1% |
| Not Working | 0 | 0.0% | 1 | 0.9% |
| Other | 0 | 0.0% | 1 | 0.9% |
| Number of Years in Practice | | | | |
| No response | 0 | 0.0% | 1 | 0.9% |
| < 5 years | 8 | 6.8% | 3 | 2.5% |
| 6-10 years | 5 | 4.2% | 6 | 5.1% |
| 11-15 years | 7 | 5.9% | 7 | 5.9% |
| 16-25 years | 25 | 21.3% | 11 | 9.4% |
| >25 years | 12 | 10.2% | 27 | 23.0% |
| Age | | | | |
| No response | 0 | 0.0% | 1 | 0.9% |
| < 30 years | 5 | 4.2% | 0 | 0.0% |
| 30-40 years | 11 | 9.4% | 9 | 7.6% |
| 41-50 years | 15 | 12.8% | 11 | 9.4% |
| 51-60 years | 20 | 17.0% | 11 | 9.4% |
| >60 years | 6 | 5.1% | 23 | 19.6% |
| Self-described Weight Status | | | | |
| No response | 0 | 0.0% | 1 | 0.9% |
| Overweight | 12 | 10.2% | 7 | 5.9% |
| Appropriate weight | 42 | 35.8% | 45 | 38.4% |
| Underweight | 1 | 0.9% | 1 | 0.9% |
| Prefer not to say | 2 | 1.7% | 1 | 0.9% |

Table I.12: Qualitative comments Question 20

| | |
|------------------------------------------------------------------|---|
| Encouragement for survey | 9 |
| Every parent of obese child encouraged to consult with physician | 1 |
| Encourage Interprofessional Education (IPE) projects | 1 |
| More healthy food options needed to meet cultural needs | 1 |
| Commendable to link oral health and overall health | 1 |
| Would be uncomfortable counseling an obese parent | 1 |
| Important to get the message out | 2 |
| Hurricane prevented delivery of mail | 3 |
| Not appropriate for dentist to advise about child's weight | 1 |