Identification of Preferred Healthy Weight Counseling Approaches for Children in the Dental Setting

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Objective: *There is a gap in the literature regarding optimal methods for the dental team to help address the childhood obesity epidemic; accordingly, this investigation sought to identify preferred communication approaches the dental team can rely upon to initiate dialogue with caregivers regarding the weight of their children.* ***Study Design***: *A structured interview guide containing seven potential Healthy Weight Counseling (HWC) approaches and eight follow up questions was developed, pilot-tested, revised and utilized as a structured interview guide. Interviews were conducted at the Children's Clinic at the School of Dentistry at the University of North Carolina at Chapel Hill (UNC-CH) with 50 participants who are English-speaking caregivers of children ages 4-12.* ***Results***: *Ninety-four percent of the participants were receptive to HWC in the dental setting. Caregivers indicated varying levels of acceptance for the seven HWC-approaches based on specific word choices in each approach. Sixty percent preferred HWC to be delivered with the child not present while 34% preferred the child's presence and 6% had no preference.* ***Conclusions***: *Caregivers were open to weight-related conversations in the dental setting but to be well received, the dental team must choose their approach carefully and establish the proper doctor/patient relationship prior to HWC delivery. An individualized HWC-approach tailored to the specific needs of each family is indicated.*

Key words: *childhood obesity, healthy-weight counseling, dentists, caregivers, dental education, parental perceptions*

INTRODUCTION

The prevalence of obesity in children and adolescents in the US increased significantly between reports form 1988-94 and 2013-14.[1] For US children and adolescents ages 2-19, the prevalence of obesity was 17.0% and extreme obesity was 5.8% in 2011-14.[1] Obesity is defined as having a BMI at or above the sex-specific 95th percentile and extreme obesity is defined as a BMI at or above 120% of the sex-specific 95th percentile.[1] Alarmingly, the prevalence of extreme obesity in adolescents between the ages of 12-19 increased over three-fold from 3% in 1988-94 to 9% in 2013-14 (9.1%).[1]

Childhood obesity is associated with a wide range of negative health consequences, many of which are long-term persisting into adulthood. Overweight children and adolescents are more likely to be overweight or obese as adults and are at increased risk for hypertension and high blood cholesterol.[2] Aside from the negative health consequences, childhood obesity is also a risk factor for undesired social consequences. Obese children and adolescents often are subjected to discrimination because of their body size.[3] Research has shown that children and adolescents with higher BMI reported increased rates of depression and lower health-related quality of lifescores.[4] Because of these myriad risks, initiatives such as Healthy People 2020 rank childhood obesity reduction as one of the highest priorities in the US, with a concomitant aim to reduce the obesity rate in children and adolescents by 10% by 2020.[5]

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Hansen and colleagues[6] recently reported a generational shift in caregivers' ability to accurately determine their children's weight status. Compared to peers with similar weights surveyed over 10 years ago, today's overweight children were less likely to be perceived as overweight by their parents. This declining rate of parental recognition of childhood obesity further complicates efforts to address the epidemic because research confirms that parental awareness and monitoring can be effective in preventing risky behavior among children and adolescents.[7] Taken together, evidence underscores the necessity for healthcare professionals to be aware of and sensitized to the childhood obesity epidemic and offer weight-related counseling.

Beginning as early as 2005, dentists have been encouraged to take a role in weight-related counseling.[8,9] The dental home provides an ideal opportunity for longitudinal weight monitoring and counseling because the dentist may see the child patient at an early age and be visited more regularly in comparison to pediatricians over time.[10] Greenberg and colleagues recently found that primary care physicians expressed favorable attitudes toward the dental team's role in screening for medical conditions such as obesity.[11] Adult patients have reported favorable views toward being screened for medical conditions in the dental chair as well as willingness to discuss height and weight.[12] In the case of children, dental teams routinely communicate with caregivers about dietary factors such as sugar-sweetened beverages that can relate to caries prevention. The height and weight of children are also often recorded at each dental visit. A pilot study conducted by Tavares and Chomitz[13] underscored that healthy weight intervention for child/adolescent dental patients is both feasible and acceptable to parents, having the potential to improve oral and systemic health for pediatric patients.

Despite the fact that the dental team may be qualified to offer weight counseling, several studies have shown that there are barriers for such counseling. A random survey of 8000 general and pediatric dentists reported that 54% were concerned about offending patients and 52% were concerned about appearing judgmental.[14] A separate survey study found similar barriers in offering weight counseling in the dental setting: fear of offending parents/patients (54%), appearing judgmental (53%), and lack of patient acceptance of weight-loss advice (47%).[15]

To address some of these barriers, Swinney and colleagues[16] investigated caregivers' opinions about weight-related counseling for their children in the dental setting, finding that caregivers were generally receptive when the doctor/patient relationship is established and the approach/tone is compassionate. While this study showed promising results advocating for weight-related intervention by the dental team, further research was recommended to establish evidence of caregivers' opinions on the best approaches to be used by the dental team.

There is minimal current literature relative to how the dental team can best initiate healthy weight discussions; accordingly, this study's goal was to expand on previous research by gaining further insight on caregivers' opinions for HWC but rather to identify optimal approaches and strategies for the dental team to relay upon in offering HWC.

MATERIALS AND METHOD

The principle investigator (JG) completed 50 semi-structured interviews with randomly selected caregivers whose children were established patients at the Children's Clinic at the School of Dentistry at the University of North Carolina at Chapel Hill (UNC-CH). Participants were English-speaking caregivers of children ages 4-12. The Non-Biomedical Internal Review Board at UNC-CH approved this investigation.

The primary investigator (JG) conducted all interviews in a private setting near the dental clinic after a thorough explanation of the study was provided and obtaining consent using approved documents. All interview data were recorded on a copy of the survey instrument. Each interview lasted approximately 15 minutes.

Survey Instrument and Structured Interview: The research team designed the research instrument—an interview guide—to address HWC topics that are lacking in the current literature. The interview guide was structured and it included seven potential approaches to HWC. These approaches presented to caregivers were imbedded with a variety of word choices (verbiage) that expressed the same fundamental message but with different words. This enabled an analysis of caregivers' receptiveness based on ***how*** the message is delivered.

Figure 1 contains abbreviated versions of the HWC approaches presented to caregivers. Eight follow-up questions were included to increase the scope of understanding of the caregivers' perceptions and to collect child/caregiver demographic data.

The interview guide was initially piloted-tested with ten caregivers whose children were under routine care in the Children's Clinic and then modified by the research team for clarity. The principle investigator then presented the interview guide to each caregiver verbally and in print. Caregiver participants provided written response on the interview guide.

The order of presentation of the HWC approaches was randomized for different groups of participants to minimize response bias.

Data Collection, Synthesis, and Analysis

All data were collected and analyzed by the primary investigator (JG) under the supervision and guidance of the research collaborators. Following each interview, the interviewer recorded the date, caregiver responses to the survey questions, follow-up questions, and any pertinent observations made during the interview process. The data were recorded using a combination of Microsoft Excel 2010 and Microsoft Word 2010.

The Chi-square test of independence was used to establish the significance of the relationship between variations in verbiage and caregivers' preferences for the seven HWC approaches presented in the interview guide. Chi-square statistics is a valuable and appropriate tool in this study to because it tests hypotheses about variables measured at the nominal level.[17] A Cramer's V value (measured between 0-1) was determined to analyze the strength of the association between variations in verbiage and caregivers' preferences for HWC.[17]

Student's t-tests were performed to compare the mean ages of children whose caregivers indicated preference either for or against child presence during HWC. All statistical analysis was performed using Microsoft Excel 2010.

Figure 1: Potential HWC approaches presented to caregivers.

#1	Informative using lay language	"The recorded weight was concerning to us. When compared to national standards, your child is overweight. This puts your child at a greater risk for diabetes, heart disease and stroke among other medical issues. Are you aware of this and are you concerned about the weight of your child? Have you used any strategies to reduce the weight?"
#2	Indirect using lay language	"Your child has a couple of cavities but before we address those needs, let us first talk about another issue. Are you concerned about your child's weight? Your child weighs much more than is recommended for someone of this age and height, and this concerns me. The diet diary suggests that your child is getting too many fats and other calorie rich foods. This is not good for the teeth or the rest of the body and puts your child at greater risk for serious health issues in the future."
#3	Direct and lacking in sensitivity using lay language containing negative terminology	"It was very disturbing when we compared the weight against the recommended standards for a child of this age and height. By the definition of the standards, your child is considered over weight! That means being fat! Are you aware that this puts your child at greater risk for future health problems such as diabetes, heart disease and stroke, even obesity? Do any of your other children or other members of the family have similar weight issues?"
#4	Direct using lay language containing negative terminology	Your child has a couple of cavities that can be easily restored. But, what really disturbs me is the weight. Being fat is not healthy for the teeth or the whole body and often leads to a lifetime weight problem. The diet diary suggests that too many foods that contain fat and excessive calories are being eaten. This needs your immediate attention. Would you like me to review the diet diary and make some suggestions?
#5	Direct using lay language containing less-negative terminology	"Your child has a couple of cavities that can be easily restored. But, what really disturbs me is the weight. Your child is a bit chubby and that is not healthy. The diet diary suggests that too many foods that contain fat and excessive calories are being eaten by your child, which can lead to some unhealthy issues as an adult. Would you like me to review the diet diary and make some suggestions?"
#6	Informative using lay language	"The recorded weight really got my attention considering the height and age. When compared to recommended guidelines, your child is overweight. This is rather alarming as it puts your child at a greater risk for diabetes, heart disease and stroke among other medical issues. Are you concerned about the weight? Have you made any changes at home to try to help your child reduce their weight?"
#7	Informative using high health literacy language	"The recorded weight really caught my attention. When compared to the Center for Disease Control's recommended guidelines, your child's Body Mass Index is greater than the 85th percentile for their age. This is rather alarming as it puts your child at an increased risk to develop Diabetes mellitus (type 2), cardiovascular diseases, hypertension, among many other chronic illnesses later in life. Would you like me to go over the diet diary and make some suggestions?"

RESULTS

A total of 50 caregiver interviews were conducted. Table 1 illustrates the caregiver demographics. The majority (68%) of caregivers identified as female, 58% were between the ages of 35 to 45, 58% reported educational levels of college degree or beyond, and 74% identified as Caucasian. Five major themes were identified from interpretation of the data and are elaborated in Table 2 with caregivers' responses to the open-ended survey question.

Theme 1*: Caregivers are receptive to having weight-related conversations in the dental setting.*

Figure 2 illustrates that 94% (47/50) of study participants were receptive to discussing their children's weight in the dental setting. Of the nine participants who reported perceiving their child as being overweight or obese, all were enthusiastic and open to discussions.

Although most caregivers welcomed the HWC discussions, 6% (3/50) preferred that such a conversations take place with the child's pediatrician. One such caregiver indicated that he personally suffers from dental anxiety and that "dental visits are stressful enough as they are," and thus weight issues should be discussed elsewhere.

Of those receptive to HWC, 56% (26/47) said they would like the message to be delivered by the dentist, while 45% (21/47) said they would be open to having the discussion with any member of the dental team.

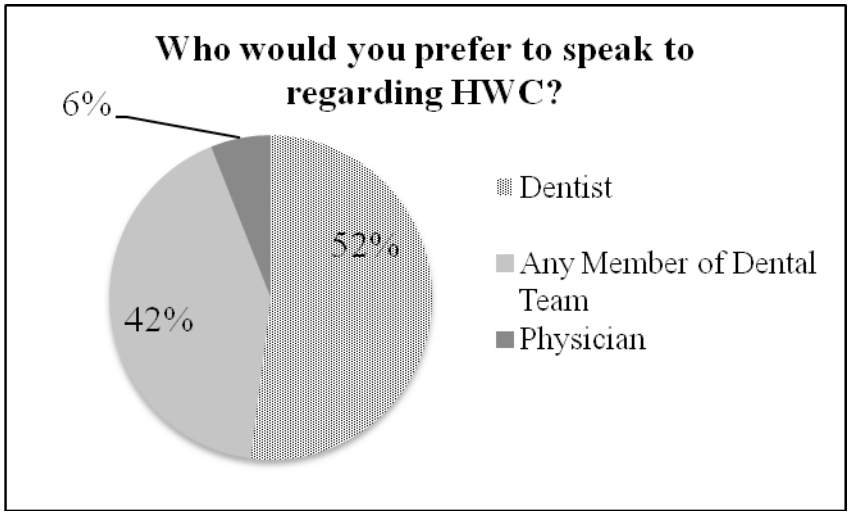
Table 1: Sociodemographic characteristics of the study participants.

Characteristic	No. of participants	Percent of participants
Sex		
Male	**16**	**32**
Female	**34**	**68**
Age Range (Years)		
<35	**4**	**8**
35-45	**29**	**58**
46-55	**12**	**24**
>55	**4**	**8**
No Response	**1**	**2**
Level of Education		
Did not finish high school	**1**	**2**
High school diploma or GED	**3**	**6**
Some technical school or community college	**14**	**28**
Community college degree	**3**	**6**
College or University degree and above	**29**	**58**
Race/Ethnicity		
White	**37**	**74**
Black or African American	**7**	**14**
Hispanic or Latino	**1**	**2**
Asian/Pacific Islander	**5**	**10**

Table 2: Major themes observed from data.

Theme 1: Caregivers are receptive to having weight-related conversations in the dental setting.	• *"good idea for dental team to be involved in combating obesity, heart disease, etc"* • *"team could try to inform kids about healthy eating and benefits it has on teeth and health"* • *""cavities=drilling=pain" dentists can use same logic to warn kids against bad diet"* • *"keep up the good work, good idea"* • *"I think having someone talk to you about nutrition is a great idea"*
Theme 2: The verbiage used to deliver HWC is associated with caregiver response, and MUST be chosen carefully.	• *"be aware you can't use the word fat!"* • *"using "recommended guidelines" is preferred over labeling a kid as "fat" or "chubby"* • *"note when suggestions are made, avoid negative wording, provide open-ended options"*
Theme 3: Clinical decisions on child presence during HWC delivery are case dependent.	• *"my child listens to input of others, it would be better to have the dentist- someone of authority, deliver the message"* • *"it would be better for the child to hear the advice (from provider) and think about the problem"* • *"discuss issue with parent first to make sure on same page before speaking to child"*
Theme 4: Building a relationship with the family is instrumental prior to offering HWC.	• *"establish relationship first, offer counseling on 3rd or 4th visit"* • *"family involvement is important"* • *"having rapport is most important before this conversation. Should not take place at first visit"*
Theme 5: Caregivers prefer HWC approach to be linked with oral health.	• *"tie this together with dental health, patients will probably be more likely to accept"* • *"include information on diet and oral hygiene when giving counseling, maybe use a pamphlet"* • *"team could try to inform kids about healthy eating and benefits it has on teeth and health"* • *"it's a good idea. Tie together bad food with bad teeth and bad health"*

Figure 2: Distribution of caregiver preference for source of HWC.



Theme 2: *The verbiage used to deliver HWC is associated with caregiver response, and Must be chosen carefully.*

Caregiver response to the presented HWC approaches varied based on the specific wording of each approach. Figure 3 shows the distribution of caregiver preference for each of the 7 potential HWC approaches. A Chi-square test of independence ($P< 0.001$) was performed to demonstrate that the resulting distribution is not random and that caregiver response is dependent on the presented HWC approach. The Cramer's V test ($V= 0.916$) performed using the Chi-square value suggests that there is strong association between the verbiage presented and caregiver response. Table 3 correlates examples of specific verbiage used in the various HWC approaches with parental receptiveness.

Theme 3: *Clinical decisions on child presence during HWC delivery are case dependent.*

Caregiver participants expressed mixed opinions on whether they prefer their children be present during the HWC discussion. Figure 4 illustrates the distribution of caregiver preference for child presence. Sixty percent (30/50) of caregivers preferred the conversation to take place without the child present, while others reported either preference for child presence (17/50, 34%) or no preference (3/50, 6%). Interestingly, the majority of participants (6/9, 66.7%) that reported perceiving their child as overweight or obese indicated preference for the child to be present during HWC.

Figure 3: Distribution of caregivers' preference for each of the 7 HWC approaches in order of favorable ratings ("Favorite" and "Good").

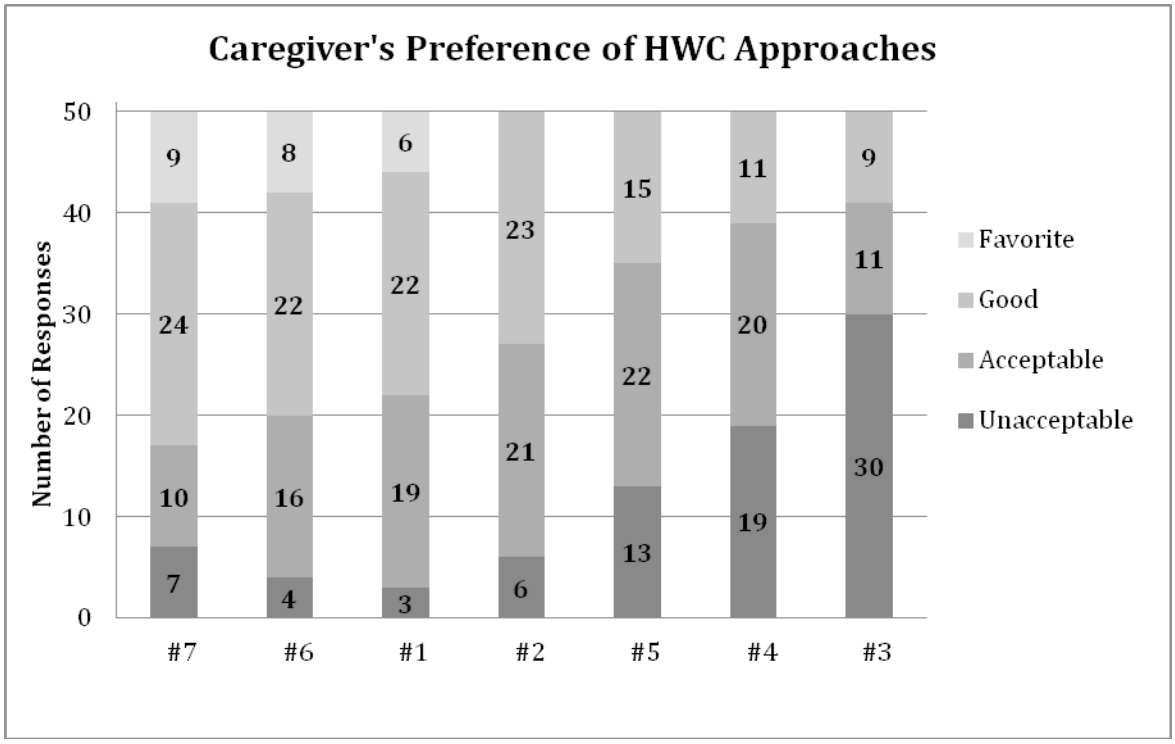
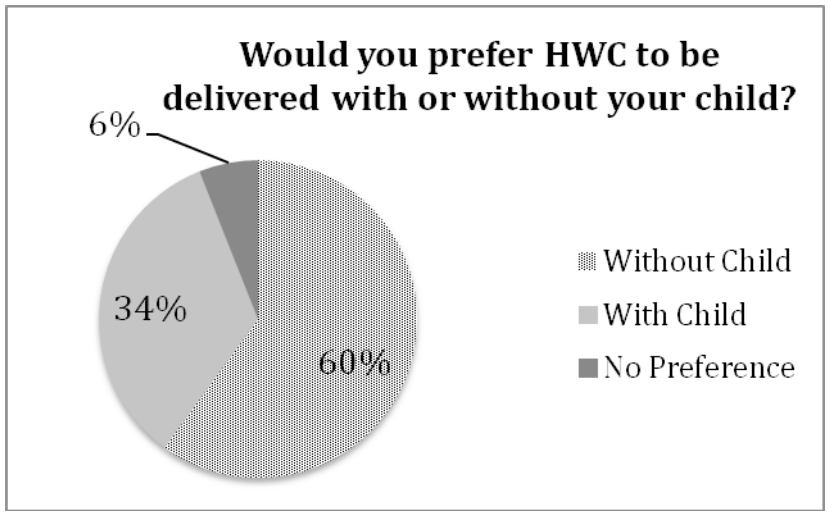


Table 3: Preference level for specific verbiage as reported by caregivers.

Preferred	Acceptable	Unacceptable
Overweight, obese		Fat, Being fat, Chubby
Heart disease	Hypertension, stroke	
Your child's weight really caught my attention	Your child's weight is very concerning	Your child's weight is really disturbing/alarming
Recommended standards, guidelines, national standards	Body Mass Index	
Diabetes	Type II Diabetes mellitus	
Would you like me to go over the diet diary and make some suggestions?		This needs your immediate attention

Figure 4: Distribution of caregiver preference for child presence during HWC.



Caregiver rationale against having the child being present include factors such as the sensitive nature of the topic, the young age of the child, and caregiver perception of child's personality. The age of the children was obtained to determine the extent to which age may affect the caregivers' preference for child inclusion, finding that at around age 10, inclusion was preferred, while inclusion was not preferred for children under age eight. (Student's t-test, $p < 0.05$). The thematic rationale for including the child in the HWC discussion as reported by caregivers was increased likelihood and willingness of the child to listen to advice from a healthcare professional.

Several participants suggested that initially HWC should be discussed with only the caregiver to ensure a "united front" approach be established between the caregiver and dental team prior to discussing the issue with the child.

Theme 4: *Building a relationship with the family is instrumental prior to offering HWC.*

Caregivers expressed understanding and appreciation for the dental team's desire to be involved in offering HWC; however, many were concerned that the weight discussion could be a sensitive topic for families and should only be undertaken after the establishment of rapport. Caregivers believe the initial visit is not an appropriate setting for HWC and that a preferred time would be at a future visit with the same provider team with whom the family had already become acquainted.

Theme 5: *Caregivers prefer HWC approach to be tied with oral health.*

Caregivers indicated HWC would be better received if the discussion included caries-related nutritional counseling. Several participants believed that pairing healthy diet discussions with preventive dentistry instructions would assist understanding of the dental team's role in dietary discussions. Other suggestions included presenting cultural sensitive informational pamphlets to the family that focus on healthy eating and its benefits for oral health.

DISCUSSION

This study is the first to offer specific verbiage to utilize and strategies to initiate a HWC discussion in a dental setting. The findings corroborate results of previous studies that have shown parental receptiveness to a weight focused discussion with the dental team. [13, 16]

These findings offer more encouragement for the dental team to participate in the interdisciplinary approach to address childhood obesity. Although the concept has been suggested by several authors beginning as early as 2005 [8,9], Ziegler and Hughes[18] recently reviewed the literature and offered a cogent argument that the dental office is an environment where weight screening and early childhood obesity intervention should be performed. Children's weights are generally routinely obtained to monitor growth and development, determine local anesthesia and sedation medications [9, 10] and the dental team has expertise at counseling caregivers in the nutritional realm. Weight-related counseling is an easy next-step and our findings reveal that most caregivers support the role of the dental team in intervening with their children's weight as long as a caring approach is taken and the end goal is to benefit the health of the child patient.

Discussion of a child patient's weight is a potentially delicate matter and must be approached carefully.[10, 16] These findings indicate that different verbiage used to discuss weight will elicit variations in caregiver response. The approach (Approach 7 in Figure 1) that received the highest number of "good" or "favorite" ratings is one that contains a high level of health literacy. Many caregivers preferred this approach because the verbiage used demonstrated the dental team's training and qualification in offering HWC while avoiding key negative words such as "fat," "disturbing," and "need immediate attention." It is important to note that this approach also received more "unacceptable" ratings in comparison to Approach 1 and Approach 6 due to its high health literacy content. Caregivers who responded negatively to Approach 7 indicated the verbiage appeared pretentious and may not be understood by all parents, noting that while it is a good idea to offer BMI range and health consequences, it is more important to explain why HWC is being delivered and explain all the health literate terms in detail. An ideal HWC approach should attempt to educate the family about the negative implications of childhood obesity without appearing critical of each family's situation. Golan and Crow[19] suggest that effective intervention should motivate parental and family involvement and have a health-centered perspective.

HWC approaches containing verbiage that demonstrated empathy and compassion were better received than those that were less personable. This is shown in Approaches 3 and 4; both of which contained verbiage such as "fat," and discussed the child's weight issue as "disturbing" and "needing immediate attention." Caregivers commented that verbiage such as "disturbing" and "alarming" should be avoided during the weight discussions because it will likely elicit negative responses from the family. On the contrary, relaying that the child's weight has "caught the attention" of the dental team and offering suggestions to help in a sympathetic manner will be better received. These results further underscore the need for providers to use a carefully chosen approach when offering HWC.

The authors' key suggestion is to individualize HWC for each family through establishing adequate rapport. Fowler-Brown and Kahwati[20] recommended using a weight intervention strategy tailored toward each family through integrating child and caregiver preferences while taking factors such as family lifestyle and patient's age, sex and cultural background into account. The findings of this study support those of Swinney and colleagues[16] who found that building the proper doctor/patient relationship is instrumental prior to offering effective HWC. Most caregivers agreed that weight discussion is a sensitive topic and should not be approached at the initial visit.

The sample of caregivers who perceived their child as OW/OB in this study was 18% (9/50). This was consistent with parental perceptions in the NHANES survey conducted 2005-2010[6] wherein parents reported perceiving 16% of boys and 22% of girls to be OW/OB. These findings show that caregivers who perceive their child as OW/OB were no less receptive to HWC. In fact this group of parents demonstrated enthusiasm and interest toward the topic.

Caregivers who perceived their child as being overweight were about twice as likely as all respondents to indicate a preference for the dental team to offer HWC in the presence of the child (68% versus 34%). We also found that caregivers of children above age 10 were more likely to prefer HWC in the presence of the child

in comparison to caregivers of younger children. Due to the age limitations of child patients in this study, future research to explore opinions of caregivers of adolescent patients to increase the scope of understanding is needed.

Just over half of the participants expressed a preference for HWC to be delivered by the dentist, while others indicted they would be comfortable having the conversation with any member of the dental team. The authors suspect the preference for direct interaction with the dentist could be influenced by the fact that the patient population within the academic setting has little if any interaction with dental hygienists. However, a pilot study conducted by Tavares and Chomitz[13] showed that a vast majority (94%) of parents who interacted with the hygienist agree the hygienist is a good person to speak with regarding the weight of their child.

Future steps toward enabling the dental team to provide healthy weight intervention should address the lack of obesity and weight management training available. A 2011 survey of US dental schools showed most dentists/dental students report receiving obesity-related information during their didactic dental education.[21] However, the same study showed that the majority of responders do not translate that information to clinical application by recording height, weight, and BMI. A separate survey study found that roughly half pediatric dental residents receive formal training on management of obese pediatric patients.[22] Residents who received training reported feeling more prepared to address overweight and obese patients in practice.[22] Due to the effectiveness of obesity management, the incorporation of obesity management training into all dental and dental auxiliary curricula to increase practitioner competency in HWC delivery is a logical future step.

The authors recommend caries-related HWC despite current literature offering mixed results regarding the relationship between obesity and dental caries. While some studies suggest an inverse relationship between obesity and dental caries of the primary dentition, others argue that childhood obesity and dental caries are problems that share similar causal factors- all of which are within the dentist's scope to prevent.[23, 24] Lasater and colleagues[25] found between 1989 and 2008, children ages 6-11 showed an upward trend in sugar-sweetened beverage consumption, which increases the risk of developing both obesity and dental caries. Relating caries prevention to HWC may increase the likelihood of caregiver acceptance of intervention. Swinney and colleagues[16] found that caregivers were receptive to caries-related counseling. The authors agree with Tseng and colleagues[10] that dentists could easily modify the caries prevention focused diet counseling to include the HWC approach that encourages generalized improved systemic health. Caregiver participants of this study indicated that HWC should be centered on nutritional health and its positive impact on oral health.

A limitation of this study is the ability to generalize findings and translate them into practice. All participants were English-speaking caregivers of children who are between the ages of 4-12.

Research aimed at investigating the opinions of caregiver from other language and cultural backgrounds is a logical next step in this field. Future studies may also focus on children of other age ranges to further explore the effects of a child's age on caregiver perception for HWC. Over half (58%) of study participants reported an educational level of college or university degree and above. The self-reported racial and ethnic distribution of our participants include 74% White, 14% Black or African American, 2% Hispanic or Latino, and 10% Asian or Pacific Islander. While this demographic distribution may not be reflective of all dental settings, especially those of a public health focus, it may be more representative of the patient base in many private practice settings.

Response bias may be another limiting factor considering the study was conducted in an academic institution setting. Caregivers may have responded favorably to the dental team's role in weight intervention due to its perceived social desirability. However, the overwhelming receptiveness to healthy-weight discussion found in our data is consistent with that reported in previous studies.[13, 16] Future studies may examine parental perception of the dental team's involvement in HWC in the private practice setting.

This study addressed a major gap in the dental team's understanding on how to best approach a weight-related conversation with the family. The authors employed a hybrid qualitative method that incorporates elements of quantitative data analytics to examine parental perceptions for specific verbiage and delivery preferences during HWC. Qualitative descriptive techniques allowed for a more detailed understanding of the research question while quantitative analysis established the significance and strength of study findings.[17, 26]

CONCLUSIONS

The findings reveal caregivers' response to HWC is influenced by variations in verbiage, thus the dental team must choose words carefully when initiating the conversation.

Caregivers were generally receptive to having a weight-related discussion with the dental team assuming the proper doctor/patient relationship has been established.

Caregivers indicated preference for HWC approach to be of a compassionate nature, linked to oral health, and individually tailored to each caregiver/child patient dyad based on their specific needs.

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