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Exploratory Research to Design a School Nurse-Delivered Intervention to Treat Adolescent Overweight and Obesity

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INTRODUCTION

Adolescent overweight and obesity, defined as a BMI ≥ 85th and 95th percentile for age and gender, respectively, have increased dramatically over the past several decades. Thirty four percent of adolescents and young adults ages 12–19 years are obese or overweight,[1] suggesting a critical need to address overweight in this population. While a number of studies have found intensive behavioral interventions in pre-adolescents to be effective for weight loss and long-term maintenance, few studies have tested interventions in adolescents and none have investigated the efficacy of interventions delivered within the school health care setting[2]. As little is known about successful strategies for implementing current treatment recommendations,[3–6] there is a need to carefully design and test interventions that can be delivered through readily accessible sites such as the school health setting, including the school nurse[7].

As the primary health professional in the school setting, school nurses have tremendous potential to identify, prevent and treat overweight and obesity in adolescents. School nurses provide accessible and continuous care, as over 95% of children and adolescents attend school and thus have access to the school health system each year;[8] they have the skills and credibility to offer health-related assistance to adolescents,[9] and they can be accessed by students without parental participation, transportation or cost. For these reasons school nurse-delivered interventions have tremendous potential for dissemination.

In addition to the tremendous potential for school nurses to address this issue, results of a recent study suggest that parents view schools as having greater responsibility to reduce obesity compared to the health care system and the government[10]. Therefore, as the primary

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health professional within the school health care system, school nurses are ideally positioned to address overweight and obesity in adolescents. However, there have been no studies to date which have investigated the impact of a weight loss interventions delivered by school nurses within the school health setting among adolescents.

We conducted a randomized clinical trial (RCT), The Lookin' Good Feelin' Good study, which tested the feasibility and potential efficacy of an innovative, theory-based school nurse-delivered intervention for the treatment of adolescent overweight in reducing BMI, improving dietary quality, increasing physical activity and decreasing sedentary behavior. The intervention incorporated current expert committee recommendations for the prevention and treatment of overweight in children and adolescents[11] and was based on Social Cognitive Theory (SCT) [12], employing cognitive-behavioral techniques to facilitate changes in self-management behaviors. As part of the formative phase of the research, we conducted a qualitative study using focus groups to gain insight into the needs and suggestions of stakeholders (i.e., students, parents, school nurses, and school personnel) regarding the design and implementation of the intervention protocol content and materials. The data gathered from these focus groups are presented in this manuscript and were used to inform the Lookin' Good Feelin' Good intervention and RCT.

METHODS

Approach

So as not to bias participants by investigators giving pre-defined choice options as on a questionnaire, qualitative research methods were used to gather suggestions from participants to see what suggestions for tailoring would emerge related to our proposed intervention concept without prompting. Focus groups were chosen as the qualitative data collection method as they can be beneficial in promoting interaction and identifying potential consensus among participants that will inform investigators how to best implement an evidence-based school-nurse intervention[13, 14]. Focus groups have long been used to inform the development of everything from surveys to websites and are particularly useful in giving potential users the opportunity to provide input into the development of a product or service they might be motivated to use if designed to meet their needs.

Sample

Five groups were recruited to participate in separate focus group sessions: male overweight and obese adolescents ages 13 to 17, female overweight and obese adolescents ages 13 to 17, parents of overweight or obese adolescents, high school nurses, and high school staff (teachers, guidance counselors, school secretaries, principals).

Recruitment

School nurses were recruited through the Massachusetts Department of Public Health, School Health Unit from the entire state of Massachusetts. For the remaining focus groups of adolescents, parents and high school staff, school nurses in three high schools located in Central and Western Massachusetts recruited participants through word of mouth, direct contact, PA announcements during home room and advertisements posted on the school website. BMI-eligible adolescents were identified by school nurses through a review of health records. Recruitment took place over a two month period between April 1st 2008 and May 31st 2008. The study protocol was approved by the University of Massachusetts Medical School Institutional Review Board. Prior to participation in the focus groups written informed consent was obtained from all adult participants ages 18 and older; written assent was obtained from adolescents younger than 18 years of age along with parental consent.

Focus Groups

The objective of the focus groups was to gain insight into the needs and suggestions of stakeholders regarding the design and implementation of a nurse-delivered intervention for overweight and obese adolescents. Focus group participants were introduced to the concept of school nurses working one-on-one with overweight and obese adolescents to assist them in making changes in their diet and level of physical activity to manage their weight. As the theoretical framework for the intervention was SCT[12], the focus group script incorporated questions soliciting insight into SCT constructs such as building knowledge, self efficacy and behavioral capability[12]. The script was developed through an iterative process involving a behavioral psychologist, nutritionists, school nurse liaison and qualitative methodology experts.

Three focus groups were conducted with each of the five different stakeholder groups (male teens, female teens, parents, nurses and school staff) resulting in a total of fifteen focus group sessions. Sample questions from the protocol are presented in Table 1. All focus groups were conducted between April 2008 and June 2008 with five to twelve participants per group. Overweight and obese adolescents were grouped by gender; all other groups were mixed gender. A single trained interviewer facilitated all focus groups. At each focus group an observer took notes, identifying which participant made which comments and non-verbal responses. Each focus group ranged between 45 minutes and 1.5 hours in length. Participants received a twenty-dollar compensation for their participation in the focus group. Demographic data including age, gender and race were collected for each participant.

Data Analysis

Sessions were audio taped, transcribed verbatim, and coded thematically within topics of interest to the research team. All data were transcribed into Microsoft Word tables by one transcriber to format them for ease of sorting text segments by theme code[15]. Two investigators read a sample of the transcripts and, using a template style of thematic analysis, a codebook was partly developed from topics of interest reflected in the focus group script such as teen specific issues, family support, implementation related concerns, and curriculum content. The template was then modified and enhanced as the transcript text was examined and themes within topic areas were identified [16]. The two investigators then discussed the themes identified and reconciled discrepancies and agreed upon a coding scheme. The codebook contained a definition of each major topic area and each theme within that major topic. Major topics were assigned whole number codes with themes assigned decimal fraction codes appended to the whole number representing the major topic to which they were related[15]. This coding structure mimics an outline of topics and related themes and causes the topical and thematic text instances to be grouped in the order of the outline structure defined by the numeric codes assigned when sorted by topic/theme code for further analysis. For example, regarding the topic of intervention implementation concerns, themes included: confidentiality, recruitment concerns, and competing demands for time. Once the coding schema was in place, theme instances related to the research topics were identified, coded, and sorted by topic/theme code. After sorting, data reduction tables [17] were created to organize and manage the qualitative data related to particular topics and related themes. Findings are presented as a description of recurrent themes within topics areas.

RESULTS

One hundred individuals participated in 15 focus group sessions, including 22 male and 19 female overweight and obese high school students, 17 parents, 13 high school nurses, and 29

high school staff (23 teachers, 2 guidance counselors, 3 school secretaries, 1 principal). Demographics of the study sample are presented in Table 2.

Focus Group Findings

Four major topics were discussed with participants, which informed the subsequent design of the RCT intervention protocol: teen specific issues, family support, implementation related concerns, and curriculum content. Key findings by major theme are presented in Table 3.

Teen Specific Issues

Teen specific issues discussed by adolescents included themes related to dealing with peer pressure, avoiding emotional eating and getting support from friends. When faced with making healthy eating and physical activity choices, adolescents reported that they may be influenced by their peers either positively or negatively. Adolescents offered suggestions on how the intervention could help teens deal with peer pressure regarding eating behavior, including asking if healthier foods are available when at a friend's home or party, bringing your own snack or healthy alternative, just saying "no" to unhealthy foods if they are offered, and only eating a small portion of the unhealthy food. Some adolescents suggested avoiding situations where they feel pressured by telling others who pressure them that they cannot hang out with them. Others suggested simply ignoring those who are pressuring them to eat poorly or to not participate in physical activity.

Strategies suggested by teens for avoiding emotional eating included engaging in some form of physical activity, talking about your feelings, and listening to or playing music. For getting support from friends for healthy eating and physical activity, participants suggested asking a friend to join the study with the adolescent and several adolescents suggested that a "true friend" will be supportive. One adolescent boy stated "only tell certain friends, the ones you feel more comfortable with secrets."

Family Support

Family Support issues include themes related to addressing the possibility that families might not be supportive of teen involvement in the intervention; strategies for gaining family support, and finding helpful ways parents might become involved in a supportive way. Feelings towards the role of the parent or family in the intervention were inconsistent among stakeholders. Several adolescents suggested that parents not be involved in the intervention at all. Alternatively, some participants, across all groups, thought it should be the adolescent's choice to involve their parents; nurses and parents suggested that, if the adolescent didn't want parents involved, reasons for this should be explored with the adolescent. One nurse stated "If the child doesn't want the parent to know what went on in each session, or discuss it with the parent, then that's up to the child."

Several adolescents and several parents voiced concerns that involving parents or families in the intervention may result in counterproductive responses or the adolescent being teased. One adolescent boy suggested "At least for me it is because I am very self conscious, and sometimes even people in your family will give you (flak) about trying to eat healthy and stuff." Several adolescent girls voiced similar concerns. "My mom, if she was at the grocery store and she was like, "Do you want me to get you anything, like a treat or something?" And I am like, "Ok, get me an apple." She'd be like, "There's something wrong with you."" Another continued "I think it is easier with your family, like you go up to your parents and say, "Listen mom, I think I am fat. I really want to go on a diet." She'll be like, "I'm not getting healthy food.""

The most common suggestion from all participant groups for gaining parental support was that the adolescent should ask the family to eat healthily with them. Additional suggestions included; that parents should exercise more with their adolescent, buy healthier foods for the home, take the adolescent food shopping with them and offer supportive feedback to their adolescent. One adolescent boy suggested "Speaking for myself, my family eats junk. So the whole family should just work together to find a good routine." Parents in the focus groups suggested that parents of adolescents in the intervention should be told how important their support is to their adolescent's success.

When asked about how adolescents could solicit support from their family, teen recommendations included thinking about what the adolescent will say to their parent ahead of time, being honest and communicating openly. One adolescent girl suggested that before an adolescent speaks with their parent they first be confident that they want to make a change: "I think you have to get yourself ready up here (in your mind) before you can actually say something about it. You have to tell yourself, "I want to change. I want to be on a diet. I want to maintain this diet. I want to be better, and I want to lose weight." If you don't have that in your head, you're not going to be able to do it."" Another suggested saying "Mom, I don't really feel comfortable with myself and I want to go down [---] sizes, so can you help me out?"

Intervention Implementation Related Concerns

Intervention implementation related concerns included themes related to preserving confidentiality, sensitive recruitment techniques, and dealing with competing demands during the school day. Confidentiality was identified most frequently by all participant groups as a potential barrier to implementation of the study. One school nurse stated "I think kids would find this more confidential than talking about sex. I think it would be, probably #1 or #2 on the top of their list of things they don't want to discuss within somebody else's hearing." A staff member suggested "I think just the confidentiality piece and the embarrassment piece." A teen boy offered one suggestion to maintain privacy: "because rumors are pretty much like a virus or something that will get passed around faster than a wildfire through a forest. But if they don't tell anyone about what some of their answers were, I don't see how it could get out."

Related to confidentiality, peer pressure and fear of being bullied were the most cited internal barriers by adolescents. One female adolescent suggested "People might be too shy, or afraid because of peer pressure – "Oh, you're going to the nurse," and someone finds out. "Oh, you're going to the nurse to lose weight." You know, it's always that fear of getting made fun of, being the laughing stock of that, you know, year. And that's something no one wants." In an attempt to enhance confidentiality teens offered various suggestions. Teen boys suggested having a private room, keeping the blinds closed, having a witty remark to respond when someone asks them why they are going to the nurse's office. Teen girls suggested completing forms online and having the student and nurse meet at the beginning of class rather than at the end of class, so that the student is coming to class late rather than leaving early.

Competing demands for time, such as after school jobs and class schedules, were the most cited external barriers to protocol implementation by all participant groups. Identification of eligible overweight and obese adolescents for recruitment was cited as a potential barrier to implementation by nurses and staff. One staff member stated "You know, it's obvious that it's a very sensitive matter for a lot of students, and you don't want to – the worst thing that you could do is alienate these students. You want them to feel they have resources here in the building that they can come to, and if you offend them you have lost that opportunity to make that connection." As a strategy to overcome this barrier nurses and staff offered

several suggestions. Researchers could recruit through the school website by posting information regarding the intervention and suggesting that interested adolescents contact the school nurse or other school staff to get additional information. Furthermore, several staff suggested that including additional school staff in the recruitment process may enhance recruitment efforts and lessen the potential unease, experienced by adolescents, of being approached to participate in an overweight and obesity treatment intervention. In the case where a particular staff member had a close relationship with an adolescent who was overweight or obese, they suggested that the adolescent may be more comfortable being approached by that staff member than any other.

Curriculum Content

Curriculum content issues included themes related to recommendation regarding nutritional information content and recommendations regarding physical activity and weight control information. Common suggestions from all participant groups for nutrition education curriculum content included information on portion sizes, healthier food choices, how to read food labels, health benefits of weight loss and the science of weight regulation. When probed about the physical activity education curriculum content, common suggestions from all participant groups included listing different types of exercise, tips for increasing physical activity and listing how many calories are burned for a given exercise. For example, one nurse stated, “Suggestions for activities. You know, instead of parking your car in the closest spot, park your car as far away as possible and walk that many more steps every day.”

DISCUSSION

Despite, the importance of addressing adolescent overweight and obesity, few studies have evaluated obesity prevention and treatment interventions among adolescents[2]. Those testing intensive intervention programs involving cognitive behavioral techniques, dietary advice or calorie-restricted diet, and a physical activity component showed promise, resulting in either reduction in weight/BMI or fat free mass, but lacked clear theoretical frameworks and process evaluations of intervention adherence. With so few rigorous studies evaluating adolescent overweight and obesity interventions, the existing literature provides little guidance on the most effective strategies for designing and implementing interventions for this unique and understudied population. Findings from the focus groups conducted in this study shed light on key challenges and recommendations from overweight and obese adolescents, their parents, and other key stakeholders regarding implementing a novel theory-based weight management intervention within the school health setting.

Four major issues were discussed within these focus groups, and recommendations were made for addressing each of the related challenges and concerns in each category: teen specific issues, family support, intervention implementation related concerns, and curriculum content.

The major teen specific issues discussed by adolescents included dealing with peer pressure and avoiding emotional eating. Older adolescents have access to foods outside the home and school and have greater ability and responsibility to make food choices compared to children and younger adolescents. These food choices can often be influenced by friends and peers[18], which may hinder weight loss efforts. Indeed the greatest concern adolescents reported was the pressure they feel from peers to eat unhealthy foods. While many factors have been shown to influence food choices among adolescents [18], this finding is consistent with the majority of previous research [19–22]. One study [22] of 108 urban Costa Rican adolescents found that adolescent boys were peer pressured to eat unhealthy foods as a sign of masculinity, where as adolescent girls were peer pressured to eat healthy foods as a sign of

femininity. In another study [21] conducted with 140 adolescents with type 1 diabetes investigating perceptions, barrier and motivation to healthy eating, peer relationships were cited as a barrier to healthy eating and peer interactions were found to increase social pressure to eat unhealthy foods. In contrast, French et al. [20] investigated potential motivating factors for vending snack choices in 418 adolescents and found peer influence was the least cited motivator for snack choice. While avoiding or overcoming peer pressure is challenging, focus group participants offered creative, practical strategies to address peer pressure in a socially acceptable manner that may enhance teens' ability to achieve their weight loss goals.

Emotional eating was another key teen specific issue raised by participants. Participants cited emotional eating as a barrier to weight loss success. Surprisingly, little data is available on the role of emotional eating on weight loss efforts in adolescents. Thus, research regarding the issue is needed. Many participants agreed that finding a healthier outlet for negative emotions would be a beneficial strategy to overcoming emotional eating.

Discrepancies were found between and within participant groups regarding the role of parents in the intervention. Many teens and parents suggested that it should be up to the adolescent whether to include the parent or to what extent parents should be included due to the concern raised that parents and family may be unsupportive or worse, sabotage the teen's efforts. This is a realistic concern given the findings from recent research [23–25] suggesting that weight teasing by family members was significantly greater in obese adolescents compared to average weight adolescents. Van den Berg et al. 2008[25] found that 33% of overweight and nearly half of obese adolescents were teased about their weight by their families, compared to 24% of average weight adolescents. Furthermore, of those who were teased about their weight 51% reported being bothered by the teasing. Eisenberg et al. 2003[23] reported that weight based teasing by family members increased adolescents' risk of low body satisfaction, low self esteem, depression, suicidal ideation and attempt.

Others felt that it was very important to have parents be involved with the adolescent's efforts. For those adolescents choosing to solicit parental support, the most frequently cited recommendation was to ask the family to eat healthily with them. Other suggestions focused on parents engaging in the healthy behaviors with the adolescents (e.g., exercising together and taking them food shopping), providing a healthy food environment in the home, and offering supportive feedback regarding their adolescent's efforts. These recommendations contribute to the literature by providing concrete strategies to address current expert committee recommendations for parental support of adolescent weight loss efforts [11].

Several barriers to intervention implementation were cited by all participant groups, including the stigma associated with being identified as overweight or obese, and the need for confidentiality. These concerns are consistent with the literature, which finds that youth with weight problems are more likely to experience depression[26] and low self esteem and are more likely to be stigmatized[27], marginalized socially[7] and teased[23] by their peers compared to their lean counterparts. The findings from this study support the expectation that adolescents may be uncomfortable being identified as overweight or obese and approached for recruitment into a weight-related intervention. This suggests the need for researchers to be sensitive to the potential social stigma associated with recruitment and participation in such trials, and the findings provide specific steps that can be taken to minimize this potential stigma.

The majority of participants in all groups agreed on the types of nutrition and physical activity education which should be included in a school nurse-delivered intervention curriculum (see Table 3). They emphasized the provision of concrete, practical strategies

that adolescents could fit into their lifestyle. These content related suggestions are consistent with those outlined by current expert driven guidelines and recommendations for pediatric overweight and obesity intervention [11, 28] and provide specific content of interest to the target audience and related stakeholders.

These findings were used to guide the development and implementation of a theoretically-based school nurse-delivered intervention tested in an RCT. For example, when determining the location of the intervention delivery, the research team ensured that private rooms were available to enhance confidentiality concerns raised during these focus groups. Originally, the research team intended to design and deliver a strong parental component within the intervention. However, after learning of the possible issues regarding parental involvement, we reduced the intensity of this component. A brief newsletter was sent to parents which simply included nutrition, physical activity and support educational materials. We were very concerned about teen's feelings of stigma associated with being identified as overweight or obese. For this reason, during recruitment sessions, all teens were asked if they would like to participate in a research study on healthy eating and physical activity. The recruitment team then spoke with all interested teens, to avoid any teen from feeling stigmatized. Additionally, the school nurse was available to speak with any teen, in private regarding the study and the teen's eligibility to participate. Recruitment and retention rates for the RCT were 100%.

The results of this study are subject to several limitations. First, inherent to focus group research, participants may respond to questions with socially desirable responses in the presence of peers. These responses may differ from those that may be gathered through one on one interviews or written questionnaires. Second, selection bias may have occurred as participants were volunteers with interest in the focus group topic. Third, 94% of the participants in the parent focus groups were female, thus the parent perspective was gathered mostly from mothers. It is possible that fathers would have different perspectives on the issues discussed and further research in this area would be beneficial. Fourth, there is variability in terms of nurse to student ratios across states. Since, this study was conducted in Massachusetts results may not be generalizable to all states. Finally, study participants were from high schools in Massachusetts, and thus represent a limited geographic range; adult participants (parents, nurses and school staff) were predominately female, and all groups were primarily White, thus results may not be applicable to adult males and to all racial and ethnic groups or those in other states.

This research provides a number of unique contributions to the field of adolescent obesity and overweight treatment. First this study solicited stakeholders' recommendations in order to tailor the development and implementation of a school based overweight and obesity treatment intervention, enhancing the likelihood of acceptance and feasibility of a novel treatment approach. Findings include recommendations regarding ways to enhance recruitment and reduce the potential stigma of adolescents being identified as overweight or obese. These findings are useful for other studies as well as our own. Secondly, this research uncovered practical teen recommended strategies to address peer pressure to eat unhealthy foods. Third, while previous research has suggested that adolescents are affected by family-inflicted weight related teasing[23–25], the results of this study are novel as they suggest that family weight related teasing might be problematic for intervention success. These recommendations can help inform the design of intervention curricula to address potential barriers to intervention implementation and efficacy.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Several key findings, including the stigma of being identified as overweight or obese and the importance of confidentiality, warrant special consideration when discussing implications of findings for research and practice. While participant confidentiality is often regarded as a paramount concern in research and practice, the findings of this study suggest particular consideration is necessary when working with overweight and obese adolescents within the school setting. During the design of intervention and recruitment protocols to be delivered in schools, researchers and clinicians need to carefully consider the methods used for recruitment and advertising, location and privacy of the intervention sessions in an attempt to enhance participant confidentiality and comfort. Coupled with confidentiality concerns is the potential for being labeled overweight or obese. While it is often apparent that an individual is overweight or obese, findings from this study and others suggest that adolescents are concerned about being labeled as such. Therefore, researchers and practitioners should carefully consider strategies to enhance sensitivity regarding how overweight and obese adolescents are identified and approached during intervention recruitment and implementation.

Debate exists in the literature regarding the importance of parental involvement in interventions targeting older adolescents. While results of a recent review of evidence suggest that parents can act as agents of change in interventions which target younger children and adolescents [28], little is known about the impact of including parents and family in interventions with older adolescents[29, 30]. And while children and younger adolescents may need parents to make or help them make healthy eating and physical activity decisions, older adolescents may prefer to assert their autonomy and make their own decisions. Further research on the impact of parental involvement in interventions which target overweight and obesity in older adolescents is needed. Until additional research has been completed, based on the present study's findings, researchers and clinicians should carefully consider whether or not to include a parental component in interventions targeting older adolescents and how best to incorporate them into the intervention. It may be beneficial to consider the adolescents' preference for involving their parents in the intervention.

As the primary health professional in the school setting, school nurses have tremendous potential to identify, prevent and treat overweight and obesity in adolescents. In addition to the school nurse, important members of the intervention team include school staff supporting the interventionists, the overweight and obese youth themselves, and possibly parents of these youth. Effective interventions for overweight and obese youth require an understanding of the needs and concerns of all involved. The in-depth information obtained through this qualitative research highlighted issues, concerns and recommendations that informed the design and implementation of an obesity intervention targeting adolescents in the school setting.

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References

1. Ogden CL, Carroll MD, Flegal KM. High body mass index for age among US children and adolescents, 2003–2006. Jama. 2008; 299(20):2401–2405. [PubMed: 18505949]

2. Roseman MG, Riddell MC, Haynes JN. A content analysis of kindergarten-12th grade school-based nutrition interventions: taking advantage of past learning. J Nutr Educ Behav. 43(1):2–18. [PubMed: 21216364]

3. Krebs NF, Jacobson MS. Prevention of pediatric overweight and obesity. Pediatrics. 2003; 112(2): 424–430. [PubMed: 12897303]

4. Montalto NJ. Implementing the guidelines for adolescent preventive services. Am Fam Physician. 1998; 57(9):2181–2188. 2189–2190. [PubMed: 9606308]

5. Lyznicki JM, Young DC, Riggs JA, Davis RM. Obesity: assessment and management in primary care. Am Fam Physician. 2001; 63(11):2185–2196. [PubMed: 11417771]

6. Gidding SS, Leibel RL, Daniels S, Rosenbaum M, Van Horn L, Marx GR. Understanding obesity in youth. A statement for healthcare professionals from the Committee on Atherosclerosis and Hypertension in the Young of the Council on Cardiovascular Disease in the Young and the Nutrition Committee, American Heart Association. Writing Group. Circulation. 1996; 94(12):3383–3387. [PubMed: 8989156]

7. Strauss RS, Pollack HA. Social marginalization of overweight children. Arch Pediatr Adolesc Med. 2003; 157(8):746–752. [PubMed: 12912779]

8. U.S. Department of Commerce CB, Historical Statistics of the United States. Colonial Times to 1970; Current Population Reports, Series P-20, various years; and Current Population Survey, October, 1970 through 2007. 2007.

9. Broussard L. School nursing: not just band-aids any more! J Spec Pediatr Nurs. 2004; 9(3):77–83. [PubMed: 15553549]

10. Evans WD, Finkelstein EA, Kamerow DB, Renaud JM. Public perceptions of childhood obesity. Am J Prev Med. 2005; 28(1):26–32. [PubMed: 15626552]

11. Barlow SE. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: summary report. Pediatrics. 2007; 120 (Suppl 4):S164–192. [PubMed: 18055651]

12. Bandura, A. Social foundation of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall; 1986.

13. Gubrium, JaHJA. Handbook of Interview research: Context and Method. Thousand Oaks, CA: Sage Publications; 2002.

14. Miller, WLCB. Clinical Research. In: Denzin, NK.; Lincoln, YS., editors. Handbook of Qualitative Research. Vol Thousand Oaks, CA: Sage Publications; 1994. p. 340-352.

15. La Pelle N. Simplifying qualitative data analysis using general purpose software tools. Field Methods. 2004; 16(1):85–108.

16. Crabtree, BF.; Miller, WL. Doing Qualitative Research in Primary Care: Multiple Strategies. 2. Newbury Park, CA: Sage Publications; 1999.

17. Miles, MBaHAM. Qualitative Data Analysis. 2. Thousand Oaks, CA: Sage Publications; 1994.

18. Neumark-Sztainer D, Story M, Perry C, Casey MA. Factors influencing food choices of adolescents: findings from focus-group discussions with adolescents. J Am Diet Assoc. 1999; 99(8):929–937. [PubMed: 10450307]

19. Evans AE, Wilson DK, Buck J, Torbett H, Williams J. Outcome expectations, barriers, and strategies for healthful eating: a perspective from adolescents from low-income families. Fam Community Health. 2006; 29(1):17–27. [PubMed: 16340675]

20. French SA, Story M, Hannan P, et al. Cognitive and demographic correlates of low-fat vending snack choices among adolescents and adults. J Am Diet Assoc. 1999; 99(4):471–475. [PubMed: 10207402]

21. Gellar LA, Schrader K, Nansel TR. Healthy eating practices: perceptions, facilitators, and barriers among youth with diabetes. Diabetes Educ. 2007; 33(4):671–679. [PubMed: 17684168]

22. Monge-Rojas R, Garita C, Sanchez M, Munoz L. Barriers to and motivators for healthful eating as perceived by rural and urban Costa Rican adolescents. J Nutr Educ Behav. 2005; 37(1):33–40. [PubMed: 15745654]

23. Eisenberg ME, Neumark-Sztainer D, Story M. Associations of weight-based teasing and emotional well-being among adolescents. Arch Pediatr Adolesc Med. 2003; 157(8):733–738. [PubMed: 12912777]

24. Neumark-Sztainer D, Falkner N, Story M, Perry C, Hannan PJ, Mulert S. Weight-teasing among adolescents: correlations with weight status and disordered eating behaviors. Int J Obes Relat Metab Disord. 2002; 26(1):123–131. [PubMed: 11791157]

25. Van den Berg P, Neumark-Sztainer D, Eisenberg ME, Haines J. Racial/ethnic differences in weight-related teasing in adolescents. Obesity (Silver Spring). 2008; 16 (Suppl 2):S3–10. [PubMed: 18978760]

26. Lau B. Global negative self-evaluations, weight and eating concerns and depressive symptoms: a prospective study of adolescents. Eat Weight Disord. 2000; 5(1):7–15. [PubMed: 10840651]

27. Tang-Peronard JL, Heitmann BL. Stigmatization of obese children and adolescents, the importance of gender. Obes Rev. 2008; 9(6):522–534. [PubMed: 18643945]

28. Flynn MA, McNeil DA, Maloff B, et al. Reducing obesity and related chronic disease risk in children and youth: a synthesis of evidence with ‘best practice’ recommendations. Obes Rev. 2006; 7 (Suppl 1):7–66. [PubMed: 16371076]

29. McLean N, Griffin S, Toney K, Hardeman W. Family involvement in weight control, weight maintenance and weight-loss interventions: a systematic review of randomised trials. Int J Obes Relat Metab Disord. 2003; 27(9):987–1005. [PubMed: 12917703]

30. Stuart WP, Broome ME, Smith BA, Weaver M. An integrative review of interventions for adolescent weight loss. J Sch Nurs. 2005; 21(2):77–85. [PubMed: 15801873]

Table 1

Sample Focus Group Questions Assessing Perceptions of Stakeholders

The nurse and teen will talk about handling social situations and peer pressure that get in the way of improving their diet and level of physical activity. What ideas or tips do you have for teens to handle these types of situations? What have you found to be helpful?
The nurse and teen will discuss ways to manage stress and emotional eating, which often gets in the way of eating healthy and taking care of ourselves. What ideas or tips do you have for teens to handle these types of situations? What have you found to be helpful?
What can parents do to assist their teen in making changes in their diet to help them manage their weight?
What can parents do to assist their teen in making changes in their level of physical activity to help them manage their weight?
What do parents need to know to provide a supportive home environment for the teen in making changes in their diet and level of physical activity?
We would like to engage parents and families in the school nurse-delivered intervention. One idea would be to send written materials home to parents with information on how to help them help their teen in making the healthy changes. What are your thoughts about this or what other ways would you recommend to engage parents?
What would be some of the barriers to implementing this intervention in the school setting?
What are some ideas you have for overcoming these barriers?
What information do teens need to help them eat healthy and increase their physical activity?

Table 2

Demographics of Focus Group Participants

	Teens (n=41)	Parents (n=17)	Nurses (n=13)	Staff (n=29)
Female	46%	94%	100%	72%
Mean age	16.0 years	45.6 years	52.0 years	42.4 years
Caucasian	93%	100%	100%	100%
African American	5%	-	-	-
American Indian	3%	-	-	-

Table 3

Key Findings from Focus Groups Assessing Perceptions of Stakeholders Regarding a School Nurse Delivered Intervention to Treat Adolescent Overweight and Obesity

Teen Specific Issues	
Challenges/Barriers	**Strategies/Recommendation**
Dealing with peer pressure	• ask for healthier foods when at a friend's home • bring your own snack or healthy alternative • just say no to unhealthy foods if they are offered • avoid situations where you feel pressured • ignore the peer pressure
Avoiding emotional eating	• do some form of physical activity • talk about your feelings • listen to or playing music
Gaining support from friends	• ask friend to join the study with the teen • tell only certain friends you are in the study
Family Support Issues	
Challenges/Barriers	**Strategies/Recommendation**
Addressing concerns that involving families may result in counterproductive responses or the teen being teased	• allow teen to choose extent of parental involvement • tell parents teen wants to make a change and need parents' help
Gaining family support	• ask the family to eat healthily with teen • tell parents how important their support is to teen's success
Finding helpful ways parents can become involved	• exercise more with their teen • buy healthier foods for the home • take the teen food shopping with them • offer supportive feedback to their teen
Intervention Implementation Related Issues	
Challenges/Barriers	**Strategies/Recommendation**
Confidentiality	• maintain confidentiality during recruitment and intervention sessions to avoid stigma of being identified as overweight or obese • conduct sessions in a private room • be prepared with response if asked why going to nurse • meet at the beginning rather than end of class
Competing demands for time (after school jobs, class schedules)	• Not Applicable
Identification of eligible overweight and obese teens for recruitment	• recruit through school website suggesting teens contact nurse to get more information • include additional staff in recruitment effort so teen can be approached by staff members they feel closest to
Curriculum Content Issues	

Teen Specific Issues	
Challenges/Barriers	**Strategies/Recommendation**
Not Applicable	**Recommendations regarding nutrition education**
	• information on portion sizes
	• information on healthier food choices
	• how to read food labels
	• health benefits of weight loss
	• the science of weight regulation
	Recommendations regarding education on physical activity and weight control
	• menu of potential physical activities to choose from
	• ideas for increasing physical activity
	• list of how many calories are burned for a given physical activity