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A Primary Care Intervention for Overweight and Obese Children and Adolescents

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A Primary Care Intervention for Overweight and Obese Children and Adolescents

A Capstone Project Presented

by

Lisa Jenike

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Abstract

The rising rates of overweight and obesity in children and adolescents have been accompanied by an increase in adverse health outcomes such as cardiovascular disease and diabetes. There is a need for evidence-based interventions that can be used by primary care providers to address this issue. Therefore, the purpose of this research translation project was to provide education to children and adolescents and their families on healthy nutrition and physical activity, thus increasing knowledge related to healthy lifestyle patterns and significantly reducing body mass index (BMI). A Primary Care Healthy Choices Intervention Program for Overweight and Obese School-Aged Children and Their Parents (Jacobson & Melnyk, 2012) was the foundation for this project. Their program highlighted the use of remote methods to offer education regarding healthy choices resulting in decreased BMI. A 1-group, 7-week pre-/posttest design was used with outcome measures including BMI percentile and physical activity and nutrition knowledge. Children and adolescents found the project to be informative and helpful in promoting healthy behaviors. Beneficial effects of the intervention included decreased BMI percentile and increased knowledge regarding healthy nutrition and physical activity. This project provides further support that remote education in conjunction with motivational interviewing can result in beneficial outcomes and may provide a convenient, cost-effective approach in which to reach this population.
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Introduction

Childhood obesity continues to be a growing health problem in the United States. According to the Centers for Disease Control (CDC, 2012), childhood obesity rates have tripled in the past three years alone. Children at risk may suffer a myriad of negative health outcomes, such as cardiovascular disease and diabetes as well as psychological distress and social implications.

Primary care providers are uniquely positioned to identify those at risk for disease, assess and screen for complications, educate and treat as appropriate. The purpose of this research translation project was to provide education to children and adolescents and their families on healthy nutrition and physical activity, thus increasing knowledge related to healthy lifestyle patterns and significantly reducing body mass index (BMI). The Primary Care Healthy Choices Intervention Program for Overweight and Obese School-Aged Children and Their Parents (Jacobson & Melnyk, 2012) was used to accomplish this objective. The approach was intended to promote the use of current recommendations to assess appropriately at-risk obese and overweight pediatric patients within primary care settings in order to provide patients with education related to nutrition and physical activity. Research has shown that increasing patient health knowledge in these areas leads to weight loss. Evaluation was on-going and measurable outcomes included a significant decrease in the BMI and a significant increase in nutrition and physical activity knowledge (using the Youth Physical Activity and Nutrition Survey) following a 7 week intervention comprising face-to-face and telephone counseling.
Statement of the problem

Despite increases in awareness of childhood overweight and obesity, the prevalence continues to increase making pediatric obesity the most common chronic disease of childhood. In 2008, more than one third of children and adolescents were overweight or obese (Ogden et al., 2010). This contributes to the rising disease burden and skyrocketing health care costs today (Ogden et al., 2010).

The following literature review highlights the negative consequences that often result from overweight and obesity in pediatric patients, underscoring the importance of appropriate assessment within pediatric primary care. Treatment interventions in primary care must consider convenience, time constraints, and cost in order to be effective. Telephone education and counseling have been utilized in clinical trials and have been shown to be beneficial. The healthy choices intervention for overweight and obese children introduced by Jacobson and Melnyk (2012) is the foundation for this research translation project.

Jacobson & Melnyk (2012) completed a one-group, 7-week pre-/posttest study design with fifteen 9-12 year old overweight and obese children and their parents in a primary care setting. Their outcome measures included BMI percentile, physical activity and nutrition knowledge, beliefs, choices and behaviors, anxiety, depression, self-concept, and social competence (Jacobson & Melnyk, 2012). Jacobson & Melnyk’s (2012) interventions were completed during four face-to-face clinic sessions alternated with three telephone sessions. Sessions included positive thinking and behavior techniques, self-esteem and peer relationship factors, portion size distortion, and reading food labels. Numerous measures were obtained to identify anxiety, depression, and self-concept as well as various measures to identify beliefs related to lifestyle, activity and nutrition knowledge (Jacobson & Melnyk, 2012). Positive results from
Jacobson & Melnyk’s Healthy Choices Intervention study included decreased BMI percentile, increased knowledge, beliefs, choices and behaviors, and self-control. For the parents, positive effects included increased knowledge, beliefs, behaviors, and decreased anxiety (Jacobson & Melnyk, 2012).

Review of the Literature

Critical appraisal of research related to problem

Adverse Health Outcomes

The rising rates of overweight and obesity in children have been accompanied by an increase in the co-occurrence of obesity-related illnesses. Cardiovascular disease (CVD) is a major risk factor of obesity in pediatric and adult patients and is the leading cause of mortality in the U. S. today (Daniels & Greer, 2005). CVD is a broad term used to describe a range of diseases that affect the heart, including coronary artery disease, arrhythmias, infections, congenital heart disease, stroke, congestive heart failure, and peripheral arterial and vascular diseases. Major risk factors for CVD include a constellation of metabolic abnormalities consisting of obesity, dyslipidemia, impaired glucose metabolism, and elevated blood pressure. Approximately 60% of overweight children and adolescents have at least one of the above cardiovascular risk factors, and more than 25% have two or more risk factors (Dietz & Robinson, 2005).

Type 2 diabetes mellitus is rising in the United States, and is another serious complication of obesity in childhood. Type 2 diabetes is a metabolic disorder that is characterized by high blood glucose in the context of insulin resistance and relative insulin deficiency. The estimated prevalence of diabetes mellitus in persons younger than 20 years of
age is approximately 1 in 400 (Spiotta & Luma, 2008). As many as 45% of all newly diagnosed diabetics have type 2 versus type 1 disease, which is defined as the autoimmune destruction of insulin producing beta cells of the pancreas leading to increased blood and urine glucose in the body. This difference between the two types of diabetes correlates strongly with obesity (Fagot-Campagna et al., 2000).

Gastrointestinal problems such as gastroesophageal reflux and constipation are exacerbated by obesity (Hampel, Abraham, & El-Serag, 2005; Fishman, Lenders, Fortunato, Noonan, & Nurko, 2004). Polycystic ovarian syndrome (PCOS) also appears to be related to obesity and occurs in ≥8% of young women between the ages of 18-25 years (Barlow, 2007). Females with PCOS are more likely to be obese and also to have insulin resistance or type 2 diabetes. They may also have metabolic syndrome (Barlow, 2007).

Taylor et al. (2006) found that overweight children and adolescents reported more fractures and musculoskeletal discomfort. Blount disease, a growth disorder resulting in abnormal ossification of the tibia, occurs more frequently in obese children and rates of overweight children who suffer from slipped capital femoral epiphysis have shown to be increased. (Lehman, Arons, Loder, & Vitale, 2006).

Obstructive sleep apnea (OSA) is found more often in those who are overweight or obese (Barlow, 2007)). Prevalence of OSA may be ≥50% among the adolescent population who are severely obese (Barlow, 2007). OSA can lead to other severe problems such as ventricular hypertrophy and pulmonary hypertension (Barlow, 2007). Hypoventilation syndrome, which results from the weight of fat on the chest and abdomen, can cause impaired ventilation, and is seen in severely obese patients (Barlow, 2007). Symptoms may present similar to those with OSA and include snoring, restless sleep, pauses in
breathing, and daytime somnolence (Barlow, 2007). It has also been found that being obese significantly increases one's risk of developing asthma, especially in girls who were non-asthmatic at baseline (Barlow, 2007).

Acanthosis nigracans, a skin condition characterized by areas of dark, velvety discolorations in body folds and creases, is present in about 10% of obese White children and 50% of obese Black children (Nguyen et al., 2001). Acanthosis nigracans is often associated with hyperinsulinaemia and has been shown to diminish with weight loss (Nguyen et al., 2001).

Those who are obese have increased inflammatory markers, which correlate with impaired glucose tolerance, hypertension, and dyslipidemia (Song, Liu, & Manson, 2008). C-reactive protein (CRP), an acute phase reactant, is considered to be a marker for cardiovascular risk and insulin resistance and has been found to be elevated in overweight and obese children with BMI’s ≥ 85th percentile (Song, Liu, & Manson, 2008). Proinflammatory cytokines, such as tumor necrosis factor-a and Interleukin (IL)-1 and IL-6 are thought to play a role in insulin resistance and have shown to be increased in the adipose tissue of obese individuals compared to lean individuals (Shoelson, Herrero, & Naaz, 2007).

Lastly, there are psychological and social implications resulting from overweight and obesity. Overweight and obese individuals often have low self-esteem and/or behavioral problems (Reilly, 2003). There are negative stereotypes associated with obese children and they are at an increased risk of being stigmatized, discriminated against, and marginalized. They are often teased and bullied. The long-term effects of being stigmatized are only beginning to be understood and can result in serious negative outcomes, such as dropping out of school (Schwartz, & Puhl, 2002).
Assessment of Overweight and Obesity in Primary Care

Risk factors associated with pediatric obesity and the subsequent adverse outcomes may be severe. In addition, the likelihood of carrying these risk factors into adulthood is high (Guo, 2002). Obese adolescents have an 80% probability of being obese as an adult (Guo, 2002). Thus, measuring weight is key for screening and risk assessment in primary care.

The causes of obesity are complex and can include genetic, biological, behavioral, and/or cultural factors (Barlow, 2007). All children and adolescents, whether at a healthy or unhealthy weight, should be assessed for medical or behavioral risk factors known to be associated with overweight and obesity (Krebs, 2007). This medical assessment should include the child’s history and physical exam, the child’s growth, and family history including parental obesity (Krebs, 2007). The behavioral assessment should include the amount of time that a child is sedentary, eating patterns (i.e. portion sizes, amount of fruits and vegetables), and physical activity habits (i.e. length of time doing moderate to vigorous intensity exercise each day) (Krebs, 2007). In addition, any family or patient concerns regarding nutrition and physical activity should be addressed (Krebs, 2007). A child and his or her family should also be assessed with regard to their level of motivation, meaning their “readiness to change” any unhealthy habits. It is important that providers identify what patients and families believe they are able to accomplish successfully for the best outcomes to be observed (Barlow, 2007). For those with a BMI at or greater than the 85th percentile, screening will also include laboratory tests (Krebs et al., 2007). Preventative and/or weight loss recommendations should then be provided to all children and adolescents, regardless of their weight.
Weight Loss Interventions

It is widely accepted that the environments of children and adolescents in the United States encourage them to overeat unhealthy calorie-dense foods and sugar sweetened beverages while reinforcing inactivity via television viewing, computer use, and video game usage (Barlow, 2007). Many children and adolescents are not meeting the recommended moderate to vigorous activity requirement (Barlow, 2007). Incorporating healthy lifestyle education for the family has demonstrated weight loss (Barlow, 2007).

For those with BMI >85th percentile, a 4-staged approach to management is recommended by the American Medical Association (AMA). Many of the recommended approaches are beyond the scope of the primary care provider, however, Stage 1 involves making specific dietary and physical activity recommendations, which are well within the scope of primary care practitioners. These include recommending that a child or adolescent eat five or more servings of fruits and vegetables daily, use the computer and/or television for no more than two hours a day, remove all television/computers from the bedroom, participate in at least 60 minutes of moderate to vigorous physical activity a day, not consume sugar-sweetened beverages, eat breakfast daily, limit meals outside of home, have family meals at least five to six times per week, and allow the child to self-regulate food intake and avoid food restriction. The American Academy of Pediatrists (AAP) Expert Committee mirrors the AMA recommendations above in their Stage 1 treatment recommendations and state that monthly follow-up should occur (Barlow, 2007).

Evidence exists that weight loss is achievable and that modest weight loss has beneficial effects on the numerous health risk factors discussed. The United States Preventive Services Task Force (USPSTF) recommends at least 24 hours of moderate to high intensity treatment over
a period of six months to be effective in weight loss (USPTF, 2010). The USPTF found that
effective comprehensive weight management programs incorporated counseling and behavioral
interventions that targeted diet and physical activity. Interventions were deemed comprehensive
if they included counseling for diet and physical activity as well as instruction and support for
the use of behavioral management techniques to help sustain changes in diet and exercise
(USPTF, 2010). These behavioral management techniques include self-monitoring, eating
management, stimulus control, contingency management, and cognitive-behavioral techniques
(USPTF, 2010).

Trials of interventions, which provide this level of treatment within primary care, have
been limited and often do not directly involve primary care providers. Additionally, the results
of such interventions have been inconsistent. Most weight loss trials have focused on intensive
in-person interventions in highly selected participants (Appel et al., 2011). Unfortunately, this
often involves multiple office visits, is time consuming for both the patient and the provider, and
is costly, all of which contribute to a high attrition rate. Other barriers to the application of many
weight loss interventions have included lack of transportation and/or time conflicts with school
and other life commitments (Appel, et al., 2011). Thus, even though it is recommended that
primary care providers offer moderate to intensive counseling and behavioral support to their
overweight and obese patients, providers lack effective, empirically supported models of
treatment to guide their efforts in helping at-risk patients lose weight (Appel et al, 2011).
Translating the success of weight loss interventions into cost-effective programs is a critical
need.

There have been several trials conducted with overweight and obese adults, which have
compared remote versus in-person intervention strategies for weight loss, with promising results
Remote interventions may provide a cost-effective means of introducing health related material in a timely, efficient, and culturally sensitive manner to those served in primary care. Advantages to remote interventions include convenience, time savings, diminished impact on family, job and lifestyle, and diminished estimated costs for travel (Jacobson & Melnyk, 2012).

Sherwood et al. (2010) completed a study evaluating two phone based weight loss programs of varying treatment lengths (10 sessions vs. 20 sessions), which showed modest weight loss in adults even at 10 sessions over 6 months. Jeffery et al. (2003) used the telephone to provide counsel for weight loss and found an average of 2.4 kg weight loss at 6 months. Appel et al. (2011) examined the effectiveness of interventions delivered in-person from those delivered remotely (both web-based and telephone) and found no significant difference between the two intervention groups. Donnelly et al. (2007) had similar findings after a 26-week randomized controlled trial, indicating that the phone based approach to weight management provided weight loss that is not different when compared with the traditional, face-to face behavioral weight management clinics.

Jabobson and Melnyk (2012) completed an intervention program for overweight and obese children. This 7-week pre/post test study had outcome measures including BMI percentile, physical activity and nutrition knowledge, beliefs, choices and behaviors, anxiety, depression, self-concept, and social competence. Results from their intervention found positive outcomes for the children including decreased BMI percentile, increased knowledge, beliefs, choices and behaviors, and self-control. Jabobson and Melnyk’s (2012) intervention consisted of personalized face-to-face sessions alternated with telephone sessions and is the basis for the
Research translation project as outlined below. This research was chosen for translation in the current project.

**Application of a theory**

Jacobson and Melnyk (2012) chose Cognitive Theory (CT) as their theoretical framework and therefore it is chosen to guide this project as well. Cognitive theory seeks to help the patient overcome difficulties by identifying and changing dysfunctional thinking, behavior, and emotional responses. CT helps patients develop skills for modifying beliefs, identifying distorted thinking, relating to others in different ways, and changing behaviors (Jacobson & Melnyk, 2012).

According to Beck (1967), a child or adolescent’s thoughts concerning interactions with the world are cognitively organized into schemas. Schemas are a person’s organized cognitive representations about prior experiences that influence the expectancies and interpretations of new experiences (Beck, 1967). Schemas are ways for a person to organize complex information into meaningful patterns. It is theorized that schemas can become distorted through a gradual process of learned misconceptions or exposures to harmful events, which occur repetitively (Jacobson & Melnyk, 2012). For example, a child who is continually teased or bullied will develop distorted negative images about him or herself.

Cognitive behavioral knowledge building supports behavior change by increasing awareness of the individual’s personal evaluation processes regarding their thoughts and behaviors (Beck, 1967). It can be used to correct misconceptions and guide the person to choose positive, healthy lifestyle patterns. This project intervention was built on knowledge acquisition, modeling, goal setting, problem solving, and cue recognition. Its design was such so as to enable the patient to reconstruct negative thoughts, which may lead to better health outcomes (Jacobson
It was hoped that such a design would ultimately result in healthier nutrition and physical activity behaviors.

**Project Description, Implementation, and Monitoring**

**A. Description of the population and community**

This research translation project took place in an outpatient pediatric primary care practice located in West Springfield, MA, a suburb of Springfield, MA. U.S. Census data reported in 2010, listed the population of West Springfield as 28,391 with 86.3% of the population being Caucasian, 8.75% Hispanic, 3.30% Black, 4.4% Asian, 0.22% Native American, 2.94% from other races, and 2.10% from two or more races (United States Census Bureau, 2011). The median household income was $40,266. The patients served at this practice are children and adolescents newborn through nineteen years of age. There are nine providers at this practice, eight pediatricians and one pediatric nurse practitioner. According to the health provider staff, this practice, like so many in the U.S. today, has seen a rise in overweight and obese patients.

**B. Organizational analysis of project site**

Pediatric Associates of Hampden County was originally established in 1975 and provides comprehensive care to infants, children and adolescents. This practice strives to establish accessible primary health care for its culturally diverse population of patients and maintains evening and weekend hours. This practice serves pediatric patients during acute illness, chronic disability as well as all stages of child growth and development.

Organizational planning proposed for this research translation project included resources such as informational technological (computer hardware and software), financial (budget provided by DNP candidate), physical (project materials, office space, and equipment), and time
(timeframe proposed). The program investigator is the author of this research translation project, a DNP candidate enrolled at the University of Massachusetts Amherst, School of Nursing.

An agreement was made among the DNP candidate, the DNP candidate’s preceptor, the practice manager, and the managing partner to utilize practice resources available including office space for collection of baseline measures. Monetary resources were relatively low for the DNP candidate who served as the main source of finances for this project’s implementation.

C. Evidence of stakeholder support

This project’s success was dependent upon support from all staff employed at this practice. Stakeholders spanned from those at the front desk to the practice manager. The providers, the nurses, the medical assistants were all vital stakeholders as were the patients and their families who participated in this intervention. Prior to program implementation, a formal letter of agreement, as evidence of support from practice management personnel and key stakeholders, was obtained.

D. Costs

The DNP candidate contributed the monetary funds required to implement this research translation project. In addition, the candidate used her own time to collect, evaluate, organize, synthesize, and analyze all data. The budget was low and included the cost of physical supplies (i.e. pens, photocopies of food/activity logs, educational hand-outs, questionnaires etc.) estimated at $75.00, telephone usage estimated at $50.00, and the purchase of Chop Chop, a non-profit magazine published to inspire children to cook healthy foods at home, estimated at $25.00. The total budget for the project was estimated at $150.00.

E. IRB approval and ethical considerations

Federal Regulations define research as “a systematic investigation, including
development, testing, and evaluation, designed to develop or contribute to generalizable knowledge” (U.S. Department of Health & Human Services, Sec. 46.102). This project differed from research as it outlined a research translation project for patient education purposes and fits within the practice scope of a nurse. Therefore, this project was exempt from IRB approval. This was determined after careful review of the Code of Federal Regulations. Information was recorded in such a manner that patients and their parents were not identified, directly or through identifiers linked to them when presented for academic purposes. Any hard data collected was coded and these codes corresponded to the same electronic code for data storage. Only the DNP candidate and the supervising physician had access to the data. In addition, all phone calls to the patients and parents were conducted confidentially as per any nurse patient telephone conversation.

F. Timeline

The timeframe and tasks are outlined in the “Timeline” table below. The planned timeframe for the implementation of this project was from December, 2012 through May, 2013.

<table>
<thead>
<tr>
<th>Task</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Capstone proposal submission/approval</td>
<td>January 2013</td>
</tr>
<tr>
<td>- Materials preparation- Determine questionnaires/measures to be used, copy food/activity logs, obtain copies of magazine</td>
<td></td>
</tr>
<tr>
<td>- Contact DNP candidate preceptor to discuss project, obtain permission to use site, obtain Letter of Agreement</td>
<td>December 2012</td>
</tr>
<tr>
<td>- Meet with clinic management, provide in-depth review of project</td>
<td>December 2012</td>
</tr>
</tbody>
</table>
Methods

Twelve patients were enrolled in this project. The patients and their families received seven weekly contacts: two personalized face-to-face office sessions and five telephone sessions. Of the 12 patients originally enrolled, 9 participants completed all sessions and data retrieved from these nine comprised the data used for analysis in this project. The initial criteria set for this intervention, included those ages 10-19 years with a BMI between the 85th and 99th percentile who are English speaking, with no mental health disorder or developmental delay, no dietary or physical activity restrictions, and who have a parent or guardian willing to participate in all of the weekly sessions. Of the original 12, data from one of the children was eliminated from the results, as her initial BMI did not meet the set criteria, however, she was included in all of the intervention sessions. One adolescent dropped from the project after the second
intervention session and one child dropped after the third intervention session. Reasons provided for project withdrawal included lack of time and disinterest.

Prior to a well and/or minor acute illness office visit, participants with an elevated BMI who met the above criteria, were contacted by the DNP candidate or the supervising physician to explain the project. If the patient and the parent agreed to participate, they were asked to come to their scheduled appointment 15 minutes prior to or remain 15 minutes after their visit to meet with the DNP candidate.

At the initial face-to-face encounter, the DNP candidate assured the child/adolescent and parent that their participation in this project was completely voluntary. In addition, the child/adolescent was told that he or she may skip any question on the measure that they were not comfortable answering. As part of the intervention, the child or adolescent was asked to complete the baseline Youth Physical Activity and Nutrition Survey (YPANS). The YPANS (see Appendix A) was designed to collect baseline data on youth knowledge about physical activity and nutrition and to explore physical activity and nutrition practices. It has been administered to youth ages 10-17 and has been found to be age appropriate. It is a self-administered questionnaire and includes questions about body weight, dietary behaviors, restaurant and school dining, vending machine usage, knowledge about nutrition, physical activity behaviors, after-school activities, knowledge about physical activity, television viewing, computer and video game usage, as well as other health behaviors such as smoking.

Educational hand-outs related to healthy eating and exercise, including the cooking magazine Chop Chop (Chop Chop, 2013), were provided at this initial visit. Hand-outs were chosen from websites such as LetsMove.gov and Choosemyplate.gov. The first educational topics were discussed which included how to read a food label and how to keep a food and
activity log. Patients and their parent/guardian were encouraged to identify habits related to their nutrition and physical activity patterns and to set specific goals for themselves to help them change unhealthy patterns. These goals were written down and a copy provided to the patient. In addition, the “Rx for Healthy Living” (AAP, see Appendix B) was completed and signed by both the patient and the DNP candidate and given to the patient as a general reminder of healthy lifestyle practices. The “Rx for Healthy Living” is another tool, designed by the AAP, to educate youth on healthy lifestyle behaviors. The baseline BMI was obtained at this initial visit and a time and date for the week 2 follow-up telephone call was made.

On weeks two through six, telephone calls were made to the child and the parent. During these telephone calls, focus was on healthy nutrition and activity behaviors. Different educational topics were shared each week. On week 2, eating a healthy breakfast and getting an appropriate amount of sleep were discussed. Week 3 topics included eating family meals and cooking with the child or adolescent. Week 4 discussions were related to limiting soda and sugar drinks and also on limiting screen time to less than 2 hours a day. Week 5 discussions were on healthy portion sizes and snacking. Lastly, the week 6 topic was on getting one or more hours of physical activity every day. During each of these phone discussions, positive behaviors were reinforced. Motivational interviewing was used to guide the child/adolescent and parent toward positive choices for themselves and in setting goals.

Motivational interviewing is a person-centered method for strengthening a person’s own motivation for and commitment to change. Motivational interviewing uses various techniques such as asking open-ended questions, validation, reflective listening, and encouraging further self-exploration. Motivational interviewing has been shown to help patients identify the thoughts
and feelings that lead to "unhealthy" behaviors as well as to help develop new thought patterns to aid in behavior change (Erickson, Gerstle, & Feldstein, 2005).

The final face-to-face visit took place in the office. At this time, the current BMI was obtained and the YPANS repeated for comparison. A review and discussion of the project content was completed with the patient and family and any questions answered at that time.

**Results**

The overall goals and objectives of this practice intervention were to reduce BMI through patient education regarding healthy nutrition and activity. The measurable outcome indicators for this project were a decrease in BMI of the child or adolescent by 0.02 and a decrease in the score of the retest YPANS at completion by 5 (a decrease in YPANS corresponds with an increase in physical activity and nutrition knowledge). Comparison, using paired-sample t tests, was used to detect a change in BMI and YPANS.

Twelve of the children/adolescents completed the baseline YPANS questionnaire and the initial face-to-face educational session. Nine of the initial 12 participants completed both of the face-to-face visits along with the 5 weeks of telephone sessions. The number of weeks required to complete the intervention ranged from 7 weeks to 9 weeks and no intervention sessions for any of the final 9 families were missed. If the child/adolescent was not available for a scheduled session, the session was rescheduled and the intervention continued.

Pre- and post-intervention data related to total nutrition and physical activity knowledge, nutrition knowledge, physical activity knowledge, and BMI percentiles were examined for each participant using a paired-samples t-test (see Appendixes C and D). The total knowledge rating pre-intervention revealed a mean score of 109 and a post-intervention mean of 98.6. The difference pre- and post-intervention showed a mean of 10.8 and the t-test gives a 95%
confidence interval between 3.3 and 18.5, a statistically significant improvement in scores (t= 3.31, df= 8, p< 0.05). Data related to physical activity knowledge showed a pre-intervention mean of 39.8 and a post-intervention mean of 34.4 with a difference in mean pre- and post-intervention of 5.33. The t-test revealed a 95% confidence interval between 0.2 and 10.5, also significant (t= 2.40, df= 8, p< 0.05). Data related to nutrition knowledge revealed a pre-intervention mean of 69.7 and post-intervention mean of 64.1. The difference pre- and post-intervention showed a mean of 5.56 and the t-test showed a 95% confidence interval between 0.2 and 10.9, again statistically significant (t= 2.4, df= 8, p< 0.05).

The paired-samples t-test for BMI percentile showed a pre-intervention mean of 95.6 and post-intervention mean of 95. The difference in mean pre- and post-intervention of BMI percentile was 0.6 with a 95% confidence interval for mean between 0.11 and 1.13. The t-test reveals the difference in BMI percentile post-intervention to be statistically significant (t= 2.5, df= 8, p< 0.05).

Discussion

The objective of this project was to increase knowledge related to nutrition and physical activity by providing education at one in-person meeting and five telephone consultations. To accomplish this objective, the DNP candidate recruited 12 overweight or obese children and adolescents and asked each of them to complete a pre/post knowledge questionnaire and provided them with relevant education for six weeks. As mentioned above, three participants were dropped for various reasons. This small sample size, along with the one group pre- and posttest design, weaken the results and do not allow for generalizability. In addition, subgroup differences such as gender, ethnicity, age, etc. could not be analyzed due to the small number of participants. Another limitation is the self-
reporting nature of the questionnaire as participants can bias their responses to appear
more socially acceptable (Paulhus & Reid, 1991).

Although an individualized phone based approach has much to offer with respect to
flexibility and convenience, the lack of face-to-face and/or group interaction may decrease
the social support component of treatment and diminish weight loss results. It may prove
useful to examine ways of incorporating social support elements to augment treatment.
For example, conducting a group conference call may be used to supplement or replace the
individual calls providing that social support. In addition, combining phone-based
interventions with web-based communication could potentially be a cost-effective,
convenient approach.

Telephone consultation was chosen for its ease in reconnecting, ease of scheduling,
and lack of transportation required, yet there were still other limitations. Oftentimes,
education was delivered only to the child or adolescent, as the parent/guardian was
unavailable or not at home at the scheduled telephone call. As behavioral changes are
more successful when the whole family is on board, this may have lessened the target
effects from the intervention. Also the lack of face-to-face communication made it more
difficult to deliver new content and information.

Another issue that arose was that of participant burden. Participants were asked to
utilize a food and activity log on a daily basis. Many patients did not complete all of the
written components of this intervention, yet beneficial effects were seen nonetheless.

After completing the intervention, children and adolescents demonstrated increases
in nutrition and physical activity knowledge and increases in their healthy lifestyle
behaviors. The increases were statistically significant and clinically meaningful.
Cognitive theory supports these findings and predicts that this intervention would increase not only the participant’s knowledge about healthy lifestyle patterns but also his or her beliefs about the ability to lead a healthy lifestyle. The theory does not predict that such an intervention would affect weight loss, yet the participants BMI percentile significantly decreased at follow-up from baseline. According to Jacobson and Melnyk (2012), the belief in the ability to adopt a healthy lifestyle may mediate this weight change.

**Implications for Practice**

Remote methods of providing education related to healthy nutrition and physical activity provide a cost-effective, convenient manner that primary care practitioners can utilize to reach their patients. The benefits of this intervention can be potentially replicated in primary care settings and meet a critical need. Expert committee recommendations have been formulated in how best to assess for overweight and obesity and the related health issues that arise due to this problem. Unfortunately, there is very little evidence of what then to do. There is strong evidence for at least 24 hours of moderate to intense behavioral modification to effect weight loss in the pediatric population (USPTF, 2010). As the number of barriers to providing this type of intervention in primary care is large, creative ways in which to provide this level of treatment are needed. Remote options such as the telephone and the web hold promise. There is a growing interest in researching these types of interventions as evidenced by Jacobson and Melnyk (2012) as well as an on-going study estimated to be complete in March of 2014 which is being conducted by the U.S. National Institutes of Health who are evaluating the efficacy of providing telephone coaching to parents of overweight 5-9 year olds.
Conclusion

Appropriate assessment and identification of overweight and obese children and adolescents has increased as expert recommendations have been formulated. Once identified, the treatment methods and counseling interventions needed to facilitate behavioral change within this population is limited in primary care due to a myriad of aforementioned barriers. Few evidence-based intervention studies exist in which to target this population in primary care, resulting in a need for pediatric overweight and obesity interventions. The study upon which this project was based, offered one of the first theory-based interventions to address overweight and obesity in the school-aged child. The results of this translation project support the use of such an intervention as they revealed both a decrease in BMI and also increased knowledge related to healthy living. This project demonstrates that remote educational interventions such as the one used here are effective when translated into the clinical setting and can be implemented in a timely, cost-effective, and efficient manner.
References


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Journal of Pediatric Gastroenterology and Nutrition, 42(1). 66-70.

DOI:10.1097/01.mpg.0000187816.31213.06


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Appendix A

2010 National Youth Physical Activity and Nutrition Survey

This survey is about health behavior. It has been developed so you can tell us what you do that may affect your health. The information you give will be used to develop better health education for young people like yourself.

DO NOT write your name on this survey. The answers you give will be kept private. No one will know what you write. Answer the questions based on what you really do.

Completing the survey is voluntary. Whether or not you answer the questions will not affect your grade in this class. If you are not comfortable answering a question, just leave it blank.

The questions that ask about your background will be used only to describe the types of students completing this survey. The information will not be used to find out your name. No names will ever be reported.

Make sure to read every question. Fill in the circles completely. When you are finished, follow the instructions of the person giving you the survey.

Thank you very much for your help.
DIRECTIONS

- Use a #2 pencil only.
- Make dark marks.
- Fill in a response like this:
  ○ Yes  ● No
- If you change your answer, erase your old answer completely.

1. How old are you?
  ○ 12 years old or younger
  ○ 13 years old
  ○ 14 years old
  ○ 15 years old
  ○ 16 years old
  ○ 17 years old
  ○ 18 years old or older

2. What is your sex?
  ○ Female
  ○ Male

3. In what grade are you?
  ○ 9th grade
  ○ 10th grade
  ○ 11th grade
  ○ 12th grade
  ○ Ungraded or other grade

4. Are you Hispanic or Latino?
  ○ Yes
  ○ No

5. What is your race? (Select one or more responses.)
  ○ American Indian or Alaskan Native
  ○ Asian
  ○ Black or African American
  ○ Native Hawaiian or Other Pacific Islander
  ○ White

6. How tall are you without your shoes on?
   Directions: Write your height in the shaded blank boxes. Fill in the matching oval below each number.

   Example:
<p>| Height |</p>
<table>
<thead>
<tr>
<th>Feet</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
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<td>0</td>
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<td>11</td>
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</tbody>
</table>

   Answer:
<p>| Height |</p>
<table>
<thead>
<tr>
<th>Feet</th>
<th>Inches</th>
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<tbody>
<tr>
<td>0</td>
<td>3</td>
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</tbody>
</table>

7. How much do you weigh without your shoes on?
   Directions: Write your weight in the shaded blank boxes. Fill in the matching oval below each number.

   Example:
<p>| Weight in Pounds |</p>
<table>
<thead>
<tr>
<th>1</th>
<th>5</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

   Answer:
<p>| Weight in Pounds |</p>
<table>
<thead>
<tr>
<th>1</th>
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<tbody>
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<td>8</td>
<td>8</td>
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<tr>
<td>0</td>
<td>9</td>
<td>9</td>
</tr>
</tbody>
</table>
The next 10 questions ask about physical activity.

8. Yesterday, were you physically active for a total of at least 60 minutes? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time.)
   ○ Yes
   ○ No

9. During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time.)
   ○ 1 day
   ○ 2 days
   ○ 3 days
   ○ 4 days
   ○ 5 days
   ○ 6 days
   ○ 7 days

10. On how many of the past 7 days did you exercise or participate in physical activity for at least 20 minutes that made you sweat and breathe hard, such as basketball, soccer, running, swimming laps, fast bicycling, fast dancing, or similar aerobic activities?
    ○ 0 days
    ○ 1 day
    ○ 2 days
    ○ 3 days
    ○ 4 days
    ○ 5 days
    ○ 6 days
    ○ 7 days

11. On how many of the past 7 days did you do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?
    ○ 0 days
    ○ 1 day
    ○ 2 days
    ○ 3 days
    ○ 4 days
    ○ 5 days
    ○ 6 days
    ○ 7 days

12. On an average school day, how many hours do you play video or computer games or use a computer for something that is not school work? (Include activities such as Nintendo, Game Boy, Play-Station, Xbox, computer games, and the Internet.)
    ○ I do not play video or computer games or use a computer for something that is not school work
    ○ Less than 1 hour per day
    ○ 1 hour per day
    ○ 2 hours per day
    ○ 3 hours per day
    ○ 4 hours per day
    ○ 5 or more hours per day

13. On an average school day, how many hours do you spend watching DVDs or videos? Include DVDs or videos you watch on a TV, computer, iPod, or other portable device.
    ○ I do not watch DVDs or videos on an average school day
    ○ Less than 1 hour per day
    ○ 1 hour per day
    ○ 2 hours per day
    ○ 3 hours per day
    ○ 4 hours per day
    ○ 5 or more hours per day
14. On an average school day, how many hours do you watch TV?
   ○ 1 do not watch TV on an average school day
   ○ Less than 1 hour per day
   ○ 1 hour per day
   ○ 2 hours per day
   ○ 3 hours per day
   ○ 4 hours per day
   ○ 5 or more hours per day

15. In an average week when you are in school, on how many days do you go to physical education (PE) classes?
   ○ 0 days
   ○ 1 day
   ○ 2 days
   ○ 3 days
   ○ 4 days
   ○ 5 days

16. How much do you agree or disagree with the following statement? I enjoyed the physical education (PE) classes I took at school during the past 12 months.
   ○ I did not take PE during the past 12 months
   ○ Strongly disagree
   ○ Disagree
   ○ Neither agree nor disagree
   ○ Agree
   ○ Strongly agree

17. During the past 12 months, on how many sports teams did you play? (Include teams run by your school or community groups.)
   ○ 0 teams
   ○ 1 team
   ○ 2 teams
   ○ 3 or more teams
For each of the following activities, please mark (1) whether you did the activity during the past 12 months, and (2) on how many of the past 7 days you did the activity. Think about activities you did before and after school, in the evenings, and on the weekends, by yourself or with others. Do not include PE or gym class. Include activities you did just for fun or in competition.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Past 12 months</th>
<th>Number of days in past 7 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. Active video games (Wii, Dance Dance Revolution [DDR])</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>19. Aerobics</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>20. Baseball/softball</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>21. Basketball</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>22. Bike riding</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>23. Cheerleading</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>24. Dance</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>25. Field hockey/street hockey/roller hockey</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>26. Football</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>27. Frisbee</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>28. Golf</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>29. Gymnastics/tumbling</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>30. Hiking</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>31. Horseback riding</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>32. Ice hockey</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>33. Ice skating</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>34. Jumping rope</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>35. Lacrosse</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>36. Marching band</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>37. Martial arts (karate, tae kwon do, judo, etc.)</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>38. Racquetball</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>39. Roller blading/roller skating</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>40. Running/jogging</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>41. Skateboarding</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>42. Soccer</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>43. Surfing</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>44. Swimming</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>45. Tennis</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>46. Track and field</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>47. Volleyball</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>48. Waterskiing</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>49. Walking</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>50. Weightlifting</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>51. Wrestling</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
<tr>
<td>52. Yoga</td>
<td>Yes No</td>
<td>01234567</td>
</tr>
</tbody>
</table>
53. How many TVs are in your home? (If you sleep in more than one home, answer based on the home you sleep in most.)
   ○ 0
   ○ 1
   ○ 2
   ○ 3
   ○ 4
   ○ 5 or more

54. Do you have a TV in your bedroom? (If you have more than one bedroom, answer based on the bedroom you sleep in most.)
   ○ Yes
   ○ No

55. In an average week when you are in school, on how many days do you walk or ride your bike to school when weather allows you to do so?
   ○ 0 days
   ○ 1 day
   ○ 2 days
   ○ 3 days
   ○ 4 days
   ○ 5 days

56. In an average week when you are in school, on how many days do you walk or ride your bike home from school when weather allows you to do so?
   ○ 0 days
   ○ 1 day
   ○ 2 days
   ○ 3 days
   ○ 4 days
   ○ 5 days
How much do you agree or disagree with each statement?  
*Mark one answer for each statement.*

<table>
<thead>
<tr>
<th>When I am physically active...</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>57. I enjoy it.</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>58. I find it fun.</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>59. it gives me energy.</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>60. my body feels good.</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>61. it gives me a strong feeling of success.</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
</tbody>
</table>

How much do you agree or disagree with each statement?  
*Mark one answer for each statement.*

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>62. At home there are enough pieces of sports equipment (such as balls, bicycles, skates) to use for physical activity.</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>63. There are playgrounds, parks, or gyms close to my home that are easy for me to get to.</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>64. It is safe to be physically active by myself in my neighborhood.</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
</tbody>
</table>

The next 4 questions ask about the adults you live with.  
*Mark one answer for each statement.*

<table>
<thead>
<tr>
<th>During a typical week, how often does an adult in your household...</th>
<th>Never</th>
<th>1-2 times/week</th>
<th>3-4 times/week</th>
<th>5-6 times/week</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>65. encourage you to do physical activities or play sports?</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>66. do a physical activity or play sports with you?</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>67. provide transportation to a place where you can do physical activities or play sports?</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>68. watch you participate in physical activities or sports?</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
</tbody>
</table>
The next 16 questions ask about food you ate or drank during the past 7 days. Think about all the meals and snacks you had from the time you got up until you went to bed. Be sure to include food you ate at home, at school, at restaurants, or anywhere else.

69. During the past 7 days, how many times did you eat fruit? (Do not count fruit juice.)
   ○ 1 did not eat fruit during the past 7 days
   ○ 1 to 3 times during the past 7 days
   ○ 4 to 6 times during the past 7 days
   ○ 1 time per day
   ○ 2 times per day
   ○ 3 times per day
   ○ 4 or more times per day

70. During the past 7 days, how many times did you eat green salad?
   ○ 1 did not eat green salad during the past 7 days
   ○ 1 to 3 times during the past 7 days
   ○ 4 to 6 times during the past 7 days
   ○ 1 time per day
   ○ 2 times per day
   ○ 3 times per day
   ○ 4 or more times per day

71. During the past 7 days, how many times did you eat potatoes? (Do not count French fries, fried potatoes, or potato chips.)
   ○ 1 did not eat potatoes during the past 7 days
   ○ 1 to 3 times during the past 7 days
   ○ 4 to 6 times during the past 7 days
   ○ 1 time per day
   ○ 2 times per day
   ○ 3 times per day
   ○ 4 or more times per day

72. During the past 7 days, how many times did you eat French fries or other fried potatoes, such as home fries, hash browns, or tots? (Do not count potato chips.)
   ○ 1 did not eat French fries or other fried potatoes during the past 7 days
   ○ 1 to 3 times during the past 7 days
   ○ 4 to 6 times during the past 7 days
   ○ 1 time per day
   ○ 2 times per day
   ○ 3 times per day
   ○ 4 or more times per day

73. During the past 7 days, how many times did you eat carrots?
   ○ 1 did not eat carrots during the past 7 days
   ○ 1 to 3 times during the past 7 days
   ○ 4 to 6 times during the past 7 days
   ○ 1 time per day
   ○ 2 times per day
   ○ 3 times per day
   ○ 4 or more times per day

74. During the past 7 days, how many times did you eat other vegetables? (Do not count green salad, potatoes, or carrots.)
   ○ 1 did not eat other vegetables during the past 7 days
   ○ 1 to 3 times during the past 7 days
   ○ 4 to 6 times during the past 7 days
   ○ 1 time per day
   ○ 2 times per day
   ○ 3 times per day
   ○ 4 or more times per day

75. During the past 7 days, how many times did you eat pizza? (Count pizza from a restaurant or school, frozen pizza, and pizza you made at home.)
   ○ 1 did not eat pizza during the past 7 days
   ○ 1 to 3 times during the past 7 days
   ○ 4 to 6 times during the past 7 days
   ○ 1 time per day
   ○ 2 times per day
   ○ 3 times per day
   ○ 4 or more times per day

76. During the past 7 days, how many times did you drink 100% fruit juices such as orange juice, apple juice, or grape juice? (Do not count punch, Kool-Aid, sports drinks, or other fruit-flavored drinks.)
   ○ 1 did not drink 100% fruit juice during the past 7 days
   ○ 1 to 3 times during the past 7 days
   ○ 4 to 6 times during the past 7 days
   ○ 1 time per day
   ○ 2 times per day
   ○ 3 times per day
   ○ 4 or more times per day
77. During the past 7 days, how many times did you drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, or Sprite? (Do not count diet soda or diet pop.)
   - I did not drink soda or pop during the past 7 days
   - 1 to 3 times during the past 7 days
   - 4 to 6 times during the past 7 days
   - 1 time per day
   - 2 times per day
   - 3 times per day
   - 4 or more times per day

78. During the past 7 days, how many times did you drink a can, bottle, or glass of diet soda or pop, such as Diet Coke, Diet Pepsi, or Sprite Zero?
   - I did not drink diet soda or pop during the past 7 days
   - 1 to 3 times during the past 7 days
   - 4 to 6 times during the past 7 days
   - 1 time per day
   - 2 times per day
   - 3 times per day
   - 4 or more times per day

79. During the past 7 days, how many times did you drink a can, bottle, or glass of a sports drink such as Gatorade or PowerAde? (Do not count low-calorie sports drinks such as Propel or G2.)
   - I did not drink sports drinks during the past 7 days
   - 1 to 3 times during the past 7 days
   - 4 to 6 times during the past 7 days
   - 1 time per day
   - 2 times per day
   - 3 times per day
   - 4 or more times per day

80. During the past 7 days, how many times did you drink a can, bottle, or glass of an energy drink, such as Red Bull or Jolt? (Do not count diet energy drinks or sports drinks such as Gatorade or PowerAde.)
   - I did not drink energy drinks during the past 7 days
   - 1 to 3 times during the past 7 days
   - 4 to 6 times during the past 7 days
   - 1 time per day
   - 2 times per day
   - 3 times per day
   - 4 or more times per day

81. During the past 7 days, how many times did you drink a cup, can, or bottle of coffee, coffee drinks, or any kind of tea?
   - I did not drink coffee, coffee drinks, or tea during the past 7 days
   - 1 to 3 times during the past 7 days
   - 4 to 6 times during the past 7 days
   - 1 time per day
   - 2 times per day
   - 3 times per day
   - 4 or more times per day

82. During the past 7 days, how many times did you drink a can, bottle, or glass of a sugar-sweetened beverage such as lemonade, sweetened tea or coffee drinks, flavored milk, Snapple, or Sunny Delight? (Do not count soda or pop, sports drinks, energy drinks, or 100% fruit juice.)
   - I did not drink sugar-sweetened beverages during the past 7 days
   - 1 to 3 times during the past 7 days
   - 4 to 6 times during the past 7 days
   - 1 time per day
   - 2 times per day
   - 3 times per day
   - 4 or more times per day

83. During the past 7 days, how many times did you drink a bottle or glass of plain water? Count tap, bottled, and unflavored sparkling water.
   - I did not drink water during the past 7 days
   - 1 to 3 times during the past 7 days
   - 4 to 6 times during the past 7 days
   - 1 time per day
   - 2 times per day
   - 3 times per day
   - 4 or more times per day

84. During the past 7 days, how many glasses of milk did you drink? (Count the milk you drank in a glass or cup, from a carton, or with cereal. Count the half pint of milk served at school as equal to one glass.)
   - I did not drink milk during the past 7 days
   - 1 to 3 glasses during the past 7 days
   - 4 to 6 glasses during the past 7 days
   - 1 glass per day
   - 2 glasses per day
   - 3 glasses per day
   - 4 or more glasses per day
The next 6 questions ask about food you ate or drank yesterday. Think about all the meals and snacks you had from the time you got up until you went to bed. Be sure to include food you ate at home, at school, at restaurants, or anywhere else.

85. Yesterday, how many times did you eat fruit? (Do not count fruit juice.)
   ○ 0 times
   ○ 1 time
   ○ 2 times
   ○ 3 times
   ○ 4 times
   ○ 5 or more times

86. Yesterday, how many times did you drink 100% fruit juices such as orange juice, apple juice, or grape juice? (Do not count punch, Kool-Aid, sports drinks, or other fruit-flavored drinks.)
   ○ 0 times
   ○ 1 time
   ○ 2 times
   ○ 3 times
   ○ 4 times
   ○ 5 or more times

87. Yesterday, how many times did you eat green salad?
   ○ 0 times
   ○ 1 time
   ○ 2 times
   ○ 3 times
   ○ 4 times
   ○ 5 or more times

88. Yesterday, how many times did you eat potatoes? (Do not count French fries, fried potatoes, or potato chips.)
   ○ 0 times
   ○ 1 time
   ○ 2 times
   ○ 3 times
   ○ 4 times
   ○ 5 or more times

89. Yesterday, how many times did you eat carrots?
   ○ 0 times
   ○ 1 time
   ○ 2 times
   ○ 3 times
   ○ 4 times
   ○ 5 or more times

90. Yesterday, how many times did you eat other vegetables? (Do not count green salad, potatoes, or carrots.)
   ○ 0 times
   ○ 1 time
   ○ 2 times
   ○ 3 times
   ○ 4 times
   ○ 5 or more times

The next 2 questions ask about how many cups of fruits and vegetables you eat or drink each day. Use the examples below as a guide when you answer these questions.

<table>
<thead>
<tr>
<th>1 CUP of FRUIT</th>
<th>1 CUP of VEGETABLES</th>
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</thead>
<tbody>
<tr>
<td>1 small apple</td>
<td>3 broccoli spears, 5 in long</td>
</tr>
<tr>
<td>1 large banana</td>
<td>1 cup of cooked leafy greens</td>
</tr>
<tr>
<td>8 large strawberries</td>
<td>2 cups of lettuce or raw greens</td>
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<tr>
<td>2 large plums</td>
<td>12 baby carrots</td>
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<tr>
<td>32 seedless grapes</td>
<td>1 large potato or sweet potato</td>
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<tr>
<td>1 cup of 100% juice</td>
<td>2 large celery stalks</td>
</tr>
<tr>
<td>½ cup dried fruit</td>
<td>1 cup of cooked beans</td>
</tr>
</tbody>
</table>

91. About how many cups of fruit (including frozen, canned, and dried fruit and 100% fruit juice) do you eat or drink each day?
   ○ None
   ○ ½ cup or less
   ○ ½ to 1 cup
   ○ 1 to 2 cups
   ○ 2 to 3 cups
   ○ 3 to 4 cups
   ○ 4 or more cups

92. About how many cups of vegetables (including frozen and canned vegetables and 100% vegetable juice) do you eat or drink each day?
   ○ None
   ○ ½ cup or less
   ○ ½ to 1 cup
   ○ 1 to 2 cups
   ○ 2 to 3 cups
   ○ 3 to 4 cups
   ○ 4 or more cups
The next 16 questions ask about meals you might have eaten during the past 7 days and the food available to you at home and at school.

93. During the past 7 days, on how many days did you eat breakfast or a morning meal?
   - 0 days
   - 1 day
   - 2 days
   - 3 days
   - 4 days
   - 5 days
   - 6 days
   - 7 days

94. During the past 7 days, on how many days did you eat lunch?
   - 0 days
   - 1 day
   - 2 days
   - 3 days
   - 4 days
   - 5 days
   - 6 days
   - 7 days

95. When you eat lunch at school, where do you usually get the food you eat?
   - I never eat lunch at school
   - From home
   - From somewhere at school
   - From somewhere else

96. When you get lunch at school, what do you usually get?
   - I do not get lunch at school
   - A complete school lunch from the school cafeteria (a meal sold at school that costs the same price every day)
   - A la carte items from the school cafeteria (items sold separately from a complete school lunch)
   - Salad bar from the school cafeteria
   - Fast food from the school cafeteria (such as McDonalds, Taco Bell, or KFC)
   - Food from a school vending machine, school canteen, or school store

97. In an average week when you are in school, on how many days do you eat all or part of a complete school lunch?
   - 0 days
   - 1 day
   - 2 days
   - 3 days
   - 4 days
   - 5 days

98. In an average week when you are in school, on how many days do you bring your own lunch to school from home?
   - 0 days
   - 1 day
   - 2 days
   - 3 days
   - 4 days
   - 5 days

99. On how many of the past 7 days did you eat dinner or an evening meal?
   - 0 days
   - 1 day
   - 2 days
   - 3 days
   - 4 days
   - 5 days
   - 6 days
   - 7 days

100. On school days, where do you usually eat dinner?
   - I do not usually eat dinner on school days
   - At home
   - At school
   - At a restaurant, including fast food restaurants
   - In a car, bus, or train
   - At a friend or relative’s house
   - Some place else
101. When you eat dinner at home, how often is a television on while you are eating?
   ○ I do not eat dinner at home
   ○ Never
   ○ Rarely
   ○ Sometimes
   ○ Most of the time
   ○ Always

102. During the past 7 days, on how many days did you eat dinner at home with at least one of your parents or guardians?
   ○ 0 days
   ○ 1 day
   ○ 2 days
   ○ 3 days
   ○ 4 days
   ○ 5 days
   ○ 6 days
   ○ 7 days

103. During the past 7 days, on how many days did you eat at least one meal or snack from a fast food restaurant such as McDonald’s, Taco Bell, or KFC?
   ○ 0 days
   ○ 1 day
   ○ 2 days
   ○ 3 days
   ○ 4 days
   ○ 5 days
   ○ 6 days
   ○ 7 days

104. How often are there fruits or vegetables to snack on in your home, such as carrots, celery, apples, bananas, or melon?
   ○ Never
   ○ Rarely
   ○ Sometimes
   ○ Most of the time
   ○ Always

105. How often are there foods such as chips, cookies, or cakes to snack on in your home?
   ○ Never
   ○ Rarely
   ○ Sometimes
   ○ Most of the time
   ○ Always

106. Does your school have a vending machine that students can use to purchase soda or pop, sports drinks, or fruit drinks that are not 100% juice, such as Coke, Gatorade, or Sunny Delight?
   ○ Yes
   ○ No
   ○ Not sure

107. Does your school have a vending machine that students can use to purchase snacks such as chips, cookies, crackers, cakes, pastries, chocolate candy, or other kinds of candy?
   ○ Yes
   ○ No
   ○ Not sure

108. Does your school have a vending machine that students can use to purchase fruits or vegetables? (Count dried fruit, such as raisins.)
   ○ Yes
   ○ No
   ○ Not sure

The next 12 questions ask about body weight.

109. How do you describe your weight?
   ○ Very underweight
   ○ Slightly underweight
   ○ About the right weight
   ○ Slightly overweight
   ○ Very overweight

110. Which of the following are you trying to do about your weight?
   ○ Lose weight
   ○ Gain weight
   ○ Stay the same weight
   ○ I am not trying to do anything about my weight
111. During the past 30 days, did you exercise to lose weight or to keep from gaining weight?
   ○ Yes
   ○ No

112. During the past 30 days, did you eat less food, fewer calories, or foods low in fat to lose weight to keep from gaining weight?
   ○ Yes
   ○ No

113. During the past 30 days, did you eat more fruits and vegetables to lose weight or keep from gaining weight?
   ○ Yes
   ○ No

114. During the past 30 days, did you eat fewer calories to lose weight or keep from gaining weight?
   ○ Yes
   ○ No

115. During the past 30 days, did you skip meals to lose weight or keep from gaining weight?
   ○ Yes
   ○ No

116. During the past 30 days, did you drink more water to lose weight or keep from gaining weight?
   ○ Yes
   ○ No

117. During the past 30 days, did you smoke cigarettes to help you lose weight or keep from gaining weight?
   ○ Yes
   ○ No
   ○ I do not smoke

118. During the past 30 days, did you go without eating for 24 hours or more (also called fasting) to lose weight or to keep from gaining weight?
   ○ Yes
   ○ No

119. During the past 30 days, did you take any diet pills, powders, or liquids without a doctor’s advice to lose weight or to keep from gaining weight? (Do not include meal replacement products such as Slim Fast.)
   ○ Yes
   ○ No

120. During the past 30 days, did you vomit or take laxatives to lose weight or to keep from gaining weight?
   ○ Yes
   ○ No

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Appendix C
Appendix D

BMI %ile

Pre  Post
Obese Children and Adolescents