A Childhood Obesity Intervention For African American and Latino Children

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A Childhood Obesity Intervention in Primary Care for African American and Latino Children

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University of Massachusetts at Amherst

In partial fulfillment of the requirements for the degree of

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Abstract

Childhood obesity is a major problem in America. The aim of this research translation project was to put into practice an evidence-based childhood obesity intervention (Let’s Go! Maine, 5210) in a primary care setting. 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. Data from the Center for Disease Control and Prevention (CDC) demonstrates higher rates of obesity in African American and Latino children, with a prevalence rate of 22.4% in Latinos and 20.2% African American children.

METHODS: This evidenced-based intervention employed a pre and post study design with a convenience sample of ten participants age 10 to 18, identified as having a body mass index (BMI) equal or greater than 85th percentile. Ten adolescents completed the data collection process and a one and half-hour weekly educational session along with follow-up calls.

RESULT: Statistical analysis comparing the pre and posttest answers of the 5210 Healthy Habits questionnaire revealed that the questions can act as a prompt for educational interventions thereby increasing the child’s awareness of healthy habits.

CONCLUSION: Findings suggest that although obesity management can be complex, early recognition and intervention of childhood obesity can promote a child’s knowledge about healthy lifestyle and promote healthy food choices leading to improved BMI outcome.

Key Words: Childhood obesity, Let’s Go! Maine-5210 program
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Introduction

Obesity is a major public health epidemic among American children. Recent statistics on childhood obesity shows that 17%, or 12.5 million of American children aged 2-19 years are obese (CDC, 2014). Data from the Center for Disease Control and Prevention (CDC) also reflect that African American and Latino children are more obese than non-Hispanic whites; with a prevalent rate of 22.4% of Latinos and 20.2% African American children (CDC, 2014). The purpose of this research translation project was to put into practice an evidence based childhood obesity intervention (Let’s Go! Maine also called 5210 program) in a primary care setting. The goal of this quality improvement program was to increase knowledge and awareness of healthy habits to adolescents and their families on healthy nutrition and physical activity, thus significantly reducing body mass index (BMI).

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 in the general population. There is a need for evidence-based interventions that can be used by primary care providers to address this issue. The 5210 program highlights the use of health questionnaires to illicit a child’s healthy lifestyles choices. Providers can look at the child’s answers on the questionnaire and offer immediate education regarding healthy choices; resulting in increased awareness and knowledge of healthy habits with a long term goal of reduction in BMI.

Children with a Body Mass Index (BMI) greater than the 95th percentile are at greater risk of developing health complications such as cardiovascular disease, hypertension, diabetes, sleep apnea, gastrointestinal disorders such as ulcers, and musculoskeletal problems (Kliegman, Behrman, St. Geme, Schor, & Stanton, 2011). Children who are obese are at risk for more health
complications as an adult. There are interventions that can be implemented by health care providers to prevent the adverse effects of childhood obesity. There have been many programs proposed to affect change in the pediatric population, such as the Ways to Enhance Children’s Activity and Nutrition (WECAN) program (Kliegman et al., 2011) and the Let’s Go! 5210 - Maine’s anti-obesity program (Rogers, Hart, Motyka, Rines, Vine & Deatrick, 2013). A key to effective obesity intervention implementing is an understanding of parental attitudes towards food choices, physical activity, as well as knowing the barriers to obesity prevention and intervention that parents and child encounter.

Health care providers need to understand the need to implement culturally competent interventions that can help reduce the prevalence of childhood obesity in America. Although obesity interventions are challenging and complex, providing education in a culturally appropriate manner allows parents to participate in helping their children make healthy lifestyles choices. According the Centers for Disease Control, interventions geared towards diminishing childhood obesity have also revealed that multi-approach solutions are best (CDC, 2014). Obesity among children should be tackled as soon as it has been identified because it can lead to chronic health problems.

Let’s Go!, is an innovative childhood obesity prevention program which began in 2006 in Portland Maine. The 5210 program was created as a response to the childhood obesity epidemic by corporate and community leaders in Maine. The program was subsequently adopted by the United Way of Greater Portland and implemented in partnership with Maine Medical Center and Maine Health (letsgo.org, 2015). In 2011, after a successful five year initiative, 5210 transitioned to a program of The Kids CO-OP at The Barbara Bush Children’s Hospital at Maine Medical Center (letsgo.org, 2015). Providers in primary care can utilize the 5210 healthy
questionnaire to generate discussions centered on healthy living lifestyle. 5210 uses the American Pediatric Academy (APA) 2007 expert recommendations on preventing childhood obesity as its guiding principle and was designed to increase awareness of healthy eating and physical activity behavior among children (Spear et al, 2007). Giving both parents and children a firm foundation in nutritional education has been shown to be a critical component in changing behavior (letsgo, 2014). The 5-2-1-0 program represents the four components of the message the program is trying to recommend for healthy lifestyle. It means eating five or more servings of vegetables each day, watching two hours or less of television or screen time, one hour or more of physical activity and zero sugary drinks, drink more water or low fat milk (Lets Go, 2014).

The Dorothy Orem’s Self Care Deficit nursing theory and motivational interviewing skills was used as a framework to guide this research translation project. The intervention took place over a three month period with five, two hour weekly educational sessions focusing on the parent and child dyad. A pre and post-test analyzing the parent and child’s awareness of healthy eating habits was conducted. The goal was to increase to 100% the percentage of parents who can understand what their child’s BMI status signifies, and to increase by 50% the parent’s awareness, knowledge and practice of healthy lifestyle choices involved in preventing and managing childhood obesity.

The implementation of this program occurred at a Pediatric Practice located in the City of Bridgeport, CT. The project occurred over a three month period with five, two hour weekly sessions focusing on the parent and child dyad with the child being the main focus of the educational intervention. The session involved a one-on-one session with the parent and child once they agree to participate in the program. An adapted questionnaire developed by Lets’ Go Maine was administered to the child at the outset of the program which included questions to test
learning specific goals rather than a specific measurement of weight (See Appendix B). The intent was to test whether the implementation of this program produced behavior change and learning in both the parent and child. Supplementary questions included specific constructs such as the meaning of Body Mass Index (BMI). The questionnaire consisted of ten items relating to nutrition, screen time, physical activity and family eating pattern. The questionnaire was used as a pre and posttest to evaluate whether changes in behavior and/or learning occurred.

**Background and Significance:**

**Statement of the Problem**

According to the CDC, the number of children in America who are overweight has more than tripled in the past three decades (CDC, 2011). The increasing prevalence of pediatric obesity has prompted leading public health agencies such as the American Academy of Pediatrics (AAP), the Centers for Disease Control and the American Heart Association (AHA) to come up with guidelines on the management of pediatric obesity. Despite all the known facts on obesity prevention and intervention, parents and health care providers have yet to prevent the rising number of children who are overweight or obese.

Obesity can simply be defined as too much body fat or clinically as having a Body Mass Index (BMI) at or greater than the 95th percentile (CDC, 2014). A normal BMI for a child is defined as being within the 5th to 85th percentile, underweight is less than 5th percentile, and severe obesity is defined as having a BMI greater than the 120th percentile. A child’s BMI is defined differently from adults and utilizes the weight and sex percentile. Accurate height and weight are measured and plotted on a BMI chart for same sex and age (CDC, 2014).

The cause of obesity among children includes environmental factors, physiological disorders such as endocrine disease, economic factors, family environment and prenatal factors
(Kliegman et al., 2011). Research on the root causes of childhood obesity has identified multiple causes of childhood obesity including cultural influences. Obesity can also be viewed as a cultural problem, since culture affects values and opinions on prevention and managing health problems (Kliegman et al., 2011). In order for childhood obesity interventions to be effective, health care providers have to keep in mind the cultural background of the individual the program is geared towards. The medical and psychosocial consequences of pediatric obesity necessitates a need for health care providers to promptly identify children who are at risk and implement an evidence-based treatment to further prevent medical complications for the child.

The American Academy of Pediatrics 2007 guideline on pediatric obesity recommends that all children be screened for BMI by their clinicians (AAP, 2007). Early recognition and identification of children who are overweight is considered a best practice. Although the latest CDC and the National Health and Nutrition Examination Survey (NHANES) data showed a 43% decline in obesity rate among American children ages 2-5 years, more effort is needed to further decrease the prevalence of obesity. This effort has intensified as health care providers are increasingly dealing with diseases attributed to obesity such as type 2 diabetics in children (CDC, 2014).

A key to effective obesity intervention implementation is an understanding of parental attitudes towards food choices and physical activity, as well as knowing the barriers to obesity prevention and interventions that parents and child encounter (Kliegman et al., 2011). Health care providers need to understand the need to implement culturally competent interventions that can help reduce the prevalence of childhood obesity in America. Interventions geared towards diminishing childhood obesity have also revealed that multi-approach solutions are best (CDC, 2014). Obesity among children should be tackled as soon as it has been identified because it can
lead to chronic health problems including diabetics, cardiovascular dysfunction, sleep apnea and poor body image.

**Evidence of the Problem**

In the United States, there has been a dramatic rise in childhood obesity in the past 30 years. The latest CDC data shows that there are differences in obesity statistics based on age, gender and race (CDC, 2014). As mentioned earlier, obesity is lower in non-Hispanic children, than in children who are Latino or African American descent (CDC, 2014). A promising statistics from CDC shows that childhood obesity has decreased from 13.9% to 8.4% since 2003 among children aged two to five years (Winograd, n.d.).

Children who are obese are at greater risk for developing medical and psychosocial complication including: cardiovascular diseases, hypertension, high cholesterol, sleep apnea, gastrointestinal problems such as esophageal reflux, musculoskeletal problems, depression, and social isolation and (CDC, 2014). Obesity in adulthood is associated with increased mortality and morbidity so it is imperative to intervene early. Health care providers have the responsibility of being advocates for children’s health and should be at the forefront of obesity prevention. Although not all obese infants become overweight children, and not all overweight children become obese adults, there is a greater likelihood that obesity beginning in early childhood will persist throughout the life span. Some attributing factors to obesity among children include access to fast food, poverty, parental obesity, prenatal factors and a lack of education on healthy eating (Staniford, Breckon, & Copeland, 2012).

Identifying children who are obese using the BMI indicator will serve as a prompt for health care providers to offer educational intervention for the child or parent. In some cases, the child might have to be referred to a nutritionist for educational sessions. Children who are
severely obese might be candidates for surgical intervention. Koopman & Mertens (2014) reviewed the impact of childhood obesity on cardiac structure and function. Their review revealed that obese children have been shown to have larger left atria and ventricular dimensions, and increased left ventricular mass compared to normal weight children. Since heart failure and significant ventricular dysfunction with reduced ejection fraction is more common in overweight adults than children, having overweight children show mild cardiac dysfunction is a cause for concern (Koopman et al., 2014). Obesity is also known to increase the risk of coronary heart disease, place extra stress on the joints, and is associated with high incidence of liver disease and asthma (Koopman, McCrindle, Slorach, Chahal, Hui, Sarkola, & Mertens, 2012).

Obesity, whether in adult or child, is a risk factor for diabetics. Diabetes in a child can have devastating consequences as it is a leading cause of numerous health problems. Diabetes can lead to kidney problems, blindness, amputations, stroke and hypertension (CDC, 2014). Reduction in a child’s weight is a good way to avoid these health problems. A child, who develops type II diabetes, will have to be on long-term medication management. Besides all these physical effects of obesity, being overweight can have a deleterious psychological effect on children.

Psychological problems such as social bullying, poor body image, suicide and psychosocial problems have all been linked to childhood obesity. Research has also linked childhood obesity to depression among children. The physical and psychological impact that being overweight has on a child’s state of health demands that health care providers intervene as soon as obesity is identified in a child. Most guidelines on childhood obesity prevention and management indicate that measuring BMI is a best practice, meaning all children should have a
baseline BMI measured at each clinical visit (CDC, 2014). A review of literature that identified effective interventions that have been applied to childhood obesity is presented

**Critical Appraisal of Research on Interventions/Innovations**

A search was conducted that looked at the following online databases: PubMed, CINAHL, Nursing Journals @Ovid and Medline. Key terms used to identify potential articles included obesity, childhood obesity, and obesity interventions. A total of 75 articles were retrieved using these criteria. Inclusion criteria consisted of articles published in the English language, and interventions conducted in the past five years (1999-2014). Exclusion criteria included non-English articles and interventions more than five years old. After a review of the 75 articles a total of 16 articles were identified as meeting the inclusion criteria and chosen for this review.

The John Hopkins Nursing Evidence-Based Practice (JHNEBP) research appraisal tool was used to appraise the articles for level of evidence and quality of research. This tool was developed by the nurses and faculty at John Hopkins hospital to guide research and evidence based practice (American Nurses Association, n.d.). From this review the researcher choose to translate the Let’s Go Maine Program into practice.

**Results:** The 16 articles that were chosen included three randomized trial protocol, one meta-analysis, three systemic reviews, four cross-sectional studies, two randomized controlled study, one elicitation article and one newspaper article. The themes that emerged from the current research on obesity among children reflect interventions that incorporate the parent–child dyad in the primary care setting. In addition, most of the research on obesity examined the concepts and risk factors of obesity such as parental obesity, lack of or low physical activity, nutritional factors such as poor choices in feeding practices, too much technology use such as
video gaming and television watching, other research examined cultural factors and its implication on childhood obesity.

The review revealed that most intervention geared towards childhood obesity is multifaceted in that it incorporated nutrition and physical activity (Basch, 2011; Ruiz, 2011). Most studies reflected treatment aimed at both parent and child (Sung-Chan et al., 2013) and the findings suggest that lifestyle modification such as increasing exercise, reduction in caloric intake, making healthy food choices and increasing knowledge about obesity all had positive effect on childhood obesity (Leary et al., 2013; Wojcicki and Heyman, 2012). An in-depth look at the studies revealed a need for health care providers to quickly assess, identify and intervene when a child with an unhealthy weight is noted. Promoting healthy behavior such as less TV time, and video game time, participation in physical activity whether at home or in school, eating less fast food and more home cooked meals and reading food labels are all ways that obesity can be eliminated. It is also important for both parents and practitioners to notice a change in a child’s weight and BMI in order for effective obesity intervention to be implemented.

Leary et al. (2013) suggested that decreasing consumption of sugary drinks, increasing fruit and vegetable intake and drinking more water are all effective strategies to combat obesity. Health care providers, after identifying a child with an unhealthy BMI, have to have a plan or strategy in place to address the problem. In addition to short interventions in the clinic, children who are obese can be referred to a dietician, or psychologist for a more intensive help. They found that including the parents in intervention treatments is a better way to improve childhood obesity. One of the most important key factors in childhood obesity prevention is acknowledging that parental involvement is necessary for an effective intervention.
Parental factors

This review reflected many themes on current research on childhood obesity that pointed to parental factors. Parental weight status, parental feeding practices, parental economic status, parental efficacy and parental beliefs system are an integral link in obesity risk for a child. Gorin, Wiley, Ohaneessian, Hernandez, Grant & Cloutier, proposed a protocol that to test the efficacy of using “brief motivational counseling” (BMC) to prevent obesity in Latino and African American children ages 2-4 years. They planned to recruit 150 mother-child dyads for 12 months from an inner city pediatric primary care center where BMC was conducted by both providers and nurses during visits.

One method involved a monthly phone call by either a nurse or a community health worker (CHW) (Gorin, Wiley, Ohannessian, Hernandez, Grant, & Cloutier, 2014). The other method involved a home visit by the CHW. For each visit or phone call, the researchers set a goal such as reduction of sweetened beverage consumption. The monthly contacts made by the CHW were designed to identify social barriers and to overcome them by goal setting. The mother-child groups were assessed at baseline and 12 months with the primary goal being a reduction in child’s BMI. The result of this intervention was a reduction in the child’s BMI at twelve-month post intervention.

This parent-child intervention was similar to the success seen in a systematic review by Sung-Chan, Sung, Zhao, and Brownson (2013) of family based interventions in the United States. The researchers examined the strength of the method, and treatment effectiveness of family-based interventions according to intervention types and theoretical orientations (Sung-Chan et al., 2013). They reviewed 15 randomized controlled trials (RCTs) of family-based lifestyle interventions for children and adolescents aged 2-19. Family-based interventions rooted
in behavior theory achieved better results than those theoretically connected to family systems in terms of treatment effectiveness (Sung-Chan et al., 2013). Other findings identified by Sung et al., 2013 in their study included, “paying attention to age when designing an intervention, family dynamics, family functioning and family worldview” (p.276).

The recommendation for current childhood obesity identified in this research states that family based interventions are necessary for effective obesity treatment in children. Similar to the research by Sung-Chan et al. (2013), Boutelle, Norman, Rock, Rhee, and Crow (2013) looked at 50 overweight or obese 8 to 12-year-old children and their parents to determine the efficacy of a guided self-help treatment for pediatric obesity (GSH-PO). The goal of the study was to compare immediate treatment of GSH-PO to a delayed treatment control of obesity. The level of impact of GSH-PO had for pediatric obesity in both groups was compared 6-months post treatment (Boutelle et al., 2013). The study was conducted at University of California and involved twelve visits in five months and included interventions that promoted healthy behaviors such as health eating (Boutelle et al., 2013). The GSH-PO showed initial efficacy in decreasing BMI for children in this study.

**Irish Study on the Parent Weight-Child Weight Link**

In identifying the link between parental weight status and child’s weight status, a study on obesity conducted by Keane, Layte, Harrington, Kearney, and Perry, known as Growing Up in Ireland (GUI) examined if parental weight and socio-economic factors is a risk factor for obesity in nine year old children. The research participants included 8568 school children (Keane et al., 2012). Overall, 25% of children were overweight (Keane et al., 2012). Finding from this study indicated that mother’s weight, mother’s education level, and household socioeconomic status correlated with child’s BMI and is a factor in the child’s weight status (Keane et al., 2012).
West Virginia Public Schools Study and Parental Weight Perception

A similar study on the correlation between parental weight status and child’s weight was done by Leary, Ice, Neal & Cottrell (2013), which looked at the association between parent and child weight related factors and health related behaviors. The Cross-Sectional study was conducted at a school based screening in West Virginia of students’ weights and a corresponding parent-reported health survey. The authors recruited eligible participants from the “Coronary Artery Risk Detection in Appalachian Communities Project” who were students in kindergarten, second, fifth, and eighth grades in the public schools for their survey. Outcome measures included having parents answer a six-question survey regarding their child’s behavior changes over the past year. Socioeconomic status was measured using child’s participation in free lunch at school. BMI status was measured for both parents and their children.

Approximately 23% of the families returned the survey (Leary et al., 2013). The findings showed that parental perception of their child’s weight status influenced their own, and their child’s health behaviors. This implies that parent and child dyads must be considered in any research or intervention that relates to a health related lifestyle change. Health behaviors in children are tied to key parental variables and obesity intervention therefore must involve the parent (Leary et al., 2013). Limitations to this study include the recruitment method, which was limited to the Appalachian and rural setting also the researchers acknowledged that parents might not be able to remember a years’ worth of information.

Parental Efficacy

Since parents are the primary care providers for their children, parental competence is necessary for a child to thrive. Grossklaus and Marvicin (2014) reviewed current literature on parental efficacy in relation to childhood obesity. The authors defined self-efficacy as “the
central cognitive core to parenting competence in which parents look within themselves to decide whether they can influence their child’s well-being.” Needs a page number for direct quote. The authors examine literature that looks at parental competence and self-efficacy, parental locus of control, parental beliefs, parental satisfaction and nursing related factors. The literature review reveals a lack of large scale studies relating to parental efficacy and obesity. The authors stated that pediatric assessment of children should include an assessment of parental perception of eating behaviors and family meal time (Grossklaus & Marvicin, 2014).

Understanding parental eating behavior assists the provider with planning interventions to encourage healthy family lifestyles. Further studies are needed to develop scales and questionnaires that involve nursing care assessment, parenting and eating behaviors in children (Grossklaus & Marvicin, 2014). The age of the children identified in this review ranged from age two to eighteen. The race of the children varied from African American to Hispanics to non-Hispanic.

Closely related to parental efficacy and its implication for childhood obesity is parental and child motivation and its impact on obesity treatment is the research by Accurso, Norman, Crow, Rock, & Boutelle (2014). The researchers studied fifty overweight 8-12 years old children to identify the role of motivation in Family-Based Guided Self-Help Treatment for Pediatric Obesity. Parents and interventionists reported on child and parent motivation level at each session. The result showed that interventionist-rated child motivation had a greater decrease in child BMI than parent motivation (Accurso et al., 2014). This study suggests that motivation may be an important predictor of reduced BMI in child obesity treatment.
Community-Integrated Health Intervention

Children spend most of their time at school or home so it is important to look at community based obesity interventions and best practices that are beneficial in reducing childhood obesity. Bleich, Segal, Wu, Wilson, & Wang (2013), performed a systemic review of community-based childhood obesity prevention studies examining specifically those that occurred in a community setting; and lasted for a year (Bleich et al., 2013). The review included studies that were conducted at a school and community setting and suggested that combined diet and physical activity intervention conducted in the community/school combined setting greatly helps in obesity reduction among children (Bleich et al., 2013). It is clear that more community-based interventions are needed to help reduce the prevalence in childhood obesity. The key to obesity reduction is proper nutrition and physical activity.

Nutritional Factors and SSBs

One of the most important components of childhood obesity is the link between proper nutrition and its impact on a child’s weight. Obesity is as a result of increased caloric intake and decreased physical activity. The current research on pediatric obesity involving nutritional factors, links parental feeding practices, poor choices in foods and snacks, lack of access to fruits and vegetables, increased in sweetened beverages, food cost and conveniences as some of the reasons for obesity in children. Tipton (2014) evaluated 19 psychosocial factors of caregivers that lead to intake of sugar-sweetened beverages among young African American children, to identify caregivers’ beliefs and perceptions and their contributory effect on their child’s weight status. An analysis of the transcripts revealed that the decision to serve sugar-sweetened beverages (SSBs) to preschoolers is driven by numerous individual, familial, cultural, and environmental factors (Tipton, 2014). Factors that lead parents to serving SSBs included
convenience, cost, taste, potential health consequences, availability, and pressure from other parents. The findings from this study are relevant in that population-specific interventions aimed at reducing SSB intake among non-Hispanic preschoolers were discussed (Tipton, 2014).

**Parental Feeding Factors**

Research has shown that parental feeding practices can be detrimental to a child’s weight status. Perrin, Rothman, Sanders, Skinner, Eden, Shintani, and Yin (2014) enrolled 863 parents in their research to examine parents and their child’s feeding habits. Perrin et al.’s (2014) randomized trial on obesity prevention, sought to find out if feeding habits differed by race and ethnicity. The research participants included 50% Latino, 27% African Americans, and 18% non–Hispanic parents (Perrin et al., 2014). Forty-five percent of the parents were practicing exclusive formula feeding and 19% were exclusively breastfeeding. The result showed that Black and Hispanic parents, were more likely to put their children to bed with a bottle, practice bottle propping, and reported watching more television when compared to whites. The researchers concluded that obesity related behaviors were more prevalent in African American and Hispanic group and suggested early and culturally adapted interventions (Perrin et al., 2014).

Similar to this finding is the result identified in the cross-sectional study conducted by Weatherspoon, Venkatesh, Horodynski, Stommel, & Brophy-Herb (2013) of food patterns and mealtime behaviors of low-income mothers and toddlers. They concluded that maternal and/or child-feeding behaviors and food choices are important contributors to childhood obesity. The authors compared the food patterns, and mealtime behaviors of 199 low income and 200 non-Hispanic white mothers enrolled in an early start program in a mid-western state. The purpose of the research was to look at factors that lead to take of nutrient-dense and energy-dense foods. Their research showed that energy-dense foods were consumed more by African American
mother–toddler dyads than by Non-Hispanic white mother-toddler dyads. The authors noted that maternal food consumption was a strong predictor of nutrient dense food intake among both groups and recommended that intervention to increase nutrient dense food should begin with the parents. Findings from this cross-sectional study indicated that socio-economics, demographic area, marital factors, and race, are important components in childhood obesity among low-income families.

Parental feeding practices correlate with childhood obesity. Environmental factors such as parental preference of certain types of foods, as well as cooking methods and parental feeding practices all play a role in obesity among children. It is well established that cultural beliefs about obesity can impact what the parent considers to be a healthy eating pattern or their child. Tschann, Gregorich, Penilla, Pasch, de Groat, Flores, & Butte (2013) created questions to analyze parental feeding practices of Mexican American parents. The participants were children aged 8-10 born to mothers of Mexican origin in the USA. A culturally based approach to measure and identify parental feeding practices was utilized. The questions included parental control of child’s food choices as well as the child’s feeding choices (Tschann et al., 2013). Parental feeding practices such as positive involvement in child eating, pressure to eat, use of food to control behavior, and restriction of amount of food were found to all impact a child’s weight status. The results further showed that mothers who reported more positive involvement had children with lower BMI percentiles, and parents who used more restrictive feeding methods had children with higher BMI percentiles (Tschann, et al., 2013).

**Sweetened Beverages**

An increase in the consumption of sweetened beverages has been identified as a major contributor to childhood obesity in America. Wojcicki and Heyman (2012), in their article on
reducing childhood obesity, discussed eliminating 100% fruit juices as a way to promote healthy weight among children. The authors gave detailed reasons why the “The Healthy Hunger-Free Kids Act of 2010” is an excellent way to change the nutritional quality of foods served in low-income child-care centers (Wojcicki & Heyman, 2012). Excessive fruit juice consumption is associated with an increased risk of obesity and is linked to metabolic syndrome, liver injury, and obesity. The author’s views are in accordance with the US Department of Agriculture's Child and Adult Food Care Program, which recommends whole fruits for children as opposed to fruit juice (Wojcicki & Heyman, 2012).

**Snack Choices**

Snack choices are clearly a contributor to childhood obesity. Wansink, Shimizu, and Brumberg (2013) investigated the snacking habits of 201 children to identify if children who ate snacks that contained poor nutritional value as opposed to snacks with more nutrient rich calorie felt fuller and therefore ate less food. The children were randomly put in four groups of nutrient rich food or non-nutrient rich food such as (1) potato chips only, (2) cheese-only, (3) vegetables only, and (4) cheese and vegetables. The researchers observed the children eating their food while watching television. The researchers then looked to see if the children were full or not. Findings showed that children ate 72% fewer calories if they ate more nutrient rich food like cheese and consumed more calories when they ate poor nutrient food like potato chips (Wansink et al., 2013). The study shows that a combination snack of vegetables and cheese are excellent ways to cut caloric intake.

**Physical Activity**

The current research reviewed for this paper identified physical activity as an effective component of any childhood obesity intervention. Although physical activity alone is not the best
approach to reduction of weight in children, its impact on obesity is highly effective. Basch (2011) conducted a literature review that looked at physical activity and the achievement gap among urban minority youth. The goal of the review is to show the prevalence and disparities of physical activity among school-aged minority children in an urban setting (Basch, 2011). The results of the literature review reveal that large proportions of youth are not physically active (Basch, 2011). It was obvious in the review by Bash that African American and Latino children needs to be more engaged in physical activity.

The Bash review indicates that a majority of the less physically active children also had less access to school-based physical activity opportunities and resources. The conclusion of the review by Bash, 2011 also indicates that physical activity among African American and Hispanic children can be achieved in multiple ways such as utilizing school break time, as well as encouraging kids to walk or bike to school. The significance of the role of physical activity in obesity intervention was also reflected in the research by Ruiz (2011), who studied Hispanic parents and their children to identify the correlation between parental physical activity level and child’s activity level. Ruiz examined baseline data collected as part of a randomized controlled trial from parents who identified themselves as Hispanic. One hundred and six, parent-child dyad were recruited for the study from a local community health center (Ruiz, 2011). The parents were randomly grouped into a weekly healthy culturally appropriate lifestyle group (intervention) or a monthly school-readiness group (control) for three months. A finding from this randomized study indicates that parental physical activity level is a factor in their child’s activity (Ruiz, 2011, P. 891).
Synthesis of Evidence

Despite all the known risk factors and interventions that have been noted by numerous governmental agencies and interest groups, obesity management continues to be a challenge. This literature review has identified that the etiology of childhood obesity can be grouped into modifiable and non-modifiable risk factors. Modifiable causes include physical inactivity, sedentary life, low socioeconomic status, unhealthy eating habits and environmental factors. The most common non-modifiable risk factor is genetics (Kliegman et al., 2011). Childhood obesity is known as a significant risk factor for numerous chronic diseases.

The link between childhood obesity and diseases such as cardiac dysfunction, sleep apnea, endocrine disorders, metabolic disorders, hypertension, diabetics and more have been well documented and researched. The consequences associated with obesity in children can predispose the child to early mortality and morbidity. It is therefore imperative that health care practitioners who work with children identify and manage obesity. The emerging themes identified in this review include the need for greater parental participation in obesity prevention and intervention. Parental and family support is necessary for effective childhood obesity intervention (Sung-Chan, 2013).

Research by Grossklaus and Marvicin (2014) reflects that understanding parental eating behavior helps in planning interventions that can assist in modifying lifestyle choices in children. A randomized controlled trial by Gorin, Wiley, Ohaneessian, Hernandez, Grant and Cloutier (2014) tested the efficacy of using “brief motivational counseling (BMC) to prevent obesity in Latino and black children ages 2-4 years. This study also supports that mother child dyad intervention is necessary for obesity intervention (Gorin et al., 2014; Sung-Chan et al., 2013 & Keane et al., 2012). Another emerging theme noted in this review is the need to identify
culturally competent interventions that can be adapted to African American and Latino children. It is apparent that parents play a big factor in their child’s lifestyle choices that can lead to being overweight (Tschann, 2014; Ruiz, 2011).

Parental influence on childhood obesity was evident in the Perrin et al. (2014) research on obesity prevention that identified the feeding behaviors of parents of different. Perrin et al.’s research concluded that black parents are more likely to put their children to bed with a bottle, practice bottle propping, and reported watching more television while Hispanic parents when compared to whites were more likely to encourage their children to finish their feeding, bottle prop and reported less tummy time. Continuing the link between parental factors and childhood obesity, the research of Weatherspoon et al. (2013), concluded that maternal and/or child-feeding behaviors and food choices are a contributor to childhood obesity.

Participation in physical activity is important for children and teens as it may have beneficial effects not only on body weight, but also on blood pressure and bone strength (Kliegman et al., 2011). Physically active children are also more likely to remain active in adolescence, and into adulthood (Bash, 2011). Pediatric obesity intervention begins with prevention efforts geared at early education of parents on risk factors for obesity, improving parental knowledge of appropriate nutrition, encouraging physical activity and informing parents of consequences of childhood obesity. The research articles identified have been incorporated in many evidenced based obesity prevention such as the Lets Go Maine obesity intervention, The Michelle Obama Let move! Program and of course the American Academy of pediatrics (AAP) obesity prevention and management initiative. Childhood obesity treatment is complex, involving various interfaces of care. It involves nutritional counseling, root analysis of cause,
economic factors and so on. The best approach thus remains a proactive prevention intervention by providers.

**Application of a Theory**

This project was conducted using the Six Sigma quality improvement process. Six Sigma was developed by Motorola in the 1980’s as a quality tool to help improve their organizational process (Ransom, Joshi, Nash, & Ransom, 2008). Six Sigma includes a five step process that has the Mnemonic “DMAIC” which stands for D: Define, M: Measure, A: Analyze, I: Improve, and C: Control (Ransom et al., 2008). Under define, the problem is identified and expectations are set, under Measure, defects are defined, goals are established and data is collected to identify the current state. Under Analyze, gaps are identified between the current and goal performance. Under Improve, innovative solutions are created and the implementation plan is done and under Control, policies are put in place to ensure success (Ransom, et al., 2008).

This research translation project was also guided by the application of Dorothy Orem’s self-care deficit theory, which stipulates that nursing care or nursing intervention is required when a patient is unable to perform self-care activities (Orem, 2014). The Self-Care Deficit Theory concept seeks to support human functioning when humans are unsuccessful in meeting what Orem defines as “universal self-care requisites” which are activities performed to maintain human functioning (Orem, 2014). Evidence has shown that obesity related interventions are most effective if a multi-approach method such as lifestyle change, motivational interview, or use of a nutritionist or dietician is used in the intervention rendered. Based on that knowledge, the DNP student research translation project aimed to include a variety of approach as a guide to frame the intervention.
Project Description, Implementation, and Monitoring

Population

The setting of this quality improvement project is a pediatric practice located in Fairfield County, CT. In 2011, median household income for residents was $35,379 (City-Data, 2014) the city’s population includes the following: Hispanic - 61,320 (42.1%), Black alone - 46,152 (31.7%), White alone - 29,057 (20.0%) and Asian 5,729 (3.9%) (City-Data, 2014). The number of children less than 18 yrs. is estimated at 25% (US Department of Commerce, 2014). The city has two main hospitals; Bridgeport hospital has a full service pediatric unit and an obesity clinic and St Vincent’s hospital does not have an inpatient pediatric unit.

Organizational Analysis of Project Site

The primary care clinic based in Bridgeport, CT was established in 2001. The practice provides comprehensive medical care to infants, children and adolescents, from newborn to age 21. The practice is noted for serving immigrants, thereby providing primary health care for a culturally diverse population. Organizational planning proposed for this research translation project obtaining access to electronic medical record, computer, telephone, printer, and fax. The previous sentence doesn’t make sense to me. Project materials from let’s go! Maine were obtained. An agreement was made between the DNP candidate and the office staff to provide support with practice resources.

Evidence of Stakeholder Support and Letter of Agreement

The key stakeholders identified for this research translation project included the Medical Director of the clinic, the office staff including the medical receptionist who schedules the patients, the Registered Nurse and the patients and their families. Other key stakeholders included the clinic’s billing department and the patients. The billing department was notified of
the proposed project to avoid any errors in billing process of the participants. A letter of stakeholder’s agreement was drafted and signed by the Medical Director of the facility.

**Resources, Constraints, Facilitators, and Potential Barriers for Project**

Educational materials from the Let’s Go! Maine program were used as a foundation and adapted to meet the needs of the participants attending. The project took place in the education room of the clinic. Available resources used for the implementation of this project included the computer, office telephone, and teaching aids such as a television with video, DVD access, and obesity handouts. One barrier was trying to quickly identify participants on busy clinic days. This was overcome by utilizing the waiting time efficiently. Quickly weighing the patients and using that time to speak to parents about the project and obtaining the consent if they meet the program criteria was another.

**Project design and feasibility**

The project was designed as a quality improvement and research translation project and was divided into four phases to allow for easier implementation of the project goals. In phase one of the project, baseline anthropometric data and demographic data was obtained after parental informed consent and child’s verbal were collected from the participants. The second phase included the implementation of the educational intervention and further collection of data. The third phase of the project involved the analysis of the data collected. The final and fourth stage involved writing up the project and dissemination of the quality improvement findings.

This project focused on the basic implementation of the program including:

1. Displaying a 5210 poster in the office
2. The provider accurately measuring all patients’ height and weight and BMI percentile
3. Conversation on healthy habits between provider and patients and
4. The utilization of the 5210 healthy questionnaires in practice.

The 5201 office was contacted in writing for permission to utilize their program. The program coordinator recommended taking the online health care module. The health care provider toolkits were ordered from the 5210 website.

**Goals, Objectives and Outcome Indicators**

The goal of this quality improvement project was to promote healthy lifestyle message among children age 10-18 in a clinical setting by educating the teenagers in lifelong healthy habits with emphasizes on proper nutrition, physical activity and healthy habits. The goal was to have at least ten participants attend weekly educational sessions. The Let’s Go! Questionnaire was be used as a pretest (Appendix B) to obtain the baseline healthy lifestyle knowledge among the children. After the educational interventions utilizing the tools from the Let’s Go! Maine website, XLSAT statistical software from EXCEL was used to analyze the difference in pre and post-test answers and BMI knowledge.

For this research translation project, a modified version of the childhood obesity toolkit from the Let’s Go! Maine as a guide for implementation of this obesity improvement project. An individualized BMI chart from Center for Disease Control website (Appendix E and F) was used for the educational session to teach the parents how to understand their child’s BMI. At the end of the educational sessions, the teenagers were given the “healthy questionnaires” to determine if there was an improvement on their knowledge of healthy lifestyle choices. To engage the parents in this process, since research has attributed obesity intervention success to parental participation, the parents were asked to explain their child’s BMI using the graphed chart at the end of the educational sessions. After the project was written up, it was shared with the office.
staff. The research translation proposal was presented at the University of Massachusetts Scholarly day.

The Six Sigma quality improvement model and Dorothy Orem’s Self Care Deficit model guided the framework for data collection and analysis. The objectives and outcome indicators for this quality improvement project was based on the goals of the Let’s Go! Maine healthy questionnaire and includes:

1. Whether or not the parents understand the meaning of BMI and what their child’s BMI is.
2. Whether or not each participant eats more fruits and vegetables
3. Whether or not each child can take the TV out of the bedroom.
4. Whether or not each child can play outside more often
5. Whether or not each child can switch to nonfat (skim) or low-fat (1%) milk.
6. Whether or not each child can spend less time watching TV/movies and playing video/computer games.
7. Whether or not each child can eat less fast food/takeout.
8. Whether or not each child can drink less soda, juice, or punch.
9. Whether or not each child can drink more water.
10. Whether each child ate healthy breakfast everyday

The following outcomes will be viewed as positive indicators following the obesity educational intervention:

1. All the parents in the intervention will understand the meaning of BMI and what their child’s BMI is within two months post intervention.
2. At least 50% of the participants will eat more fruits and vegetables within two months post intervention.
3. At least 50% of the participants will take the TV out of the bedroom within two months post intervention.

4. At least 50% of the participants will play outside more often within two months post intervention.

5. At least 50% of the participants will switch to nonfat (skim) or low-fat (1%) milk within two months post intervention.

6. At least 50% of the participants will spend less time watching TV/movies and playing video/computer games within two months post intervention.

7. At least 50% of the participants will eat less fast food/takeout within two months post intervention.

8. At least 50% of the participants will drink less soda, juice, or punch within two months post intervention.

9. At least 50% of the participants will drink more water within two months post intervention.

10. At least 50% of the participants will eat healthy breakfast everyday within two months post intervention.

**Population Sample**

Upon approval from the DNP Committee on the proposal, children who met the inclusion criteria and their parents were recruited and included in the implementation. The sample included a convenience sample of children age ten to eighteen, identified as having a BMI equal or greater than 85th percentile. Patients were screened for possible inclusion as they walked in for well or ill visits. Children whose physical assessment shows a BMI equal or greater than 85th percentile were included. Inclusion criteria for participation in the project consisted of the following: male
or female, African American or Latino children, child age ten to eighteen, identified as having BMI equal or greater than 85 percentile. Other inclusion criteria ability to speak and write in English, and a signed consent form from the parent and child. Exclusion criteria were non-English speaking parents who required the assistance of a language translator, and parents that did not agree to participate.

**Project Implementation and Project time line**

This project was implemented over a three month time frame (See program timeline Appendix H). In January of 2015, a meeting was conducted with the Medical Director of the practice and the office staff. The meeting included a detailed description of the Let’s Go! Childhood Obesity Program. The DNP student discussed the time frame of the project and provided the staff with a description of the program goals and objectives. Next, flyers describing the project were placed in the waiting room of the clinic (Appendix A.). A sign-up sheet with contact information was also place in the lobby. Once a parent agreed to participate, the DNP student engaged the parent and child for about 15 minute to schedule a follow up appointment. The parents were then encouraged to bring the child so they can listen in on the proposed plan and to obtain child’s consent Follow up appointment was scheduled within one week after the initial first contact. The follow up appointment lasted about 90 minutes. The meeting included administration of the healthy habit questionnaire as a pre-test to evaluate the child’s knowledge base before implementation of the program.

A modified questionnaire from the Let’s Go! Maine website (Appendix B) was used for the pretest and posttest. A weekly session consisting of one and two hour educational information was conducted. A total of five weekly sessions were conducted. Each week different topics focusing on the 5210 program were discussed. At the end of the five weekly sessions, a
posttest was done to evaluate the child’s knowledge of the 5210 program. A BMI chart for boys (Appendix C) and for girls (Appendix D) was be used for the BMI education. The participants make sure this is all past tense will also be given an evaluation form to assess the project (Appendix G). April to May 2015 was used to write up the project.

**Budget and Cost**

The total budget for this research proposal was 550 dollars. The DNP student purchased incentives for the participants and their families. The budget for this research proposal involved a $10 Wal-Mart gift card for each participating family. Each child was also given a. a jump rope brochures and weight loss resources of the health tool kits from the Let’s Go! 5-2-1-0 Maine program. The total cost of the tool kits, water bottles, and wrist bands and brochures was 225 dollars.

**IRB Approval and Ethical Considerations**

Internal Review Board was not needed for this quality improvement project, as it was a research translation project. Demographic data such as name, age, sex and race change to past tense were all coded with the names kept in a separate locked box, and a locked office was used during the project to protect patient information. All patient information was confidential and not shared. Potential eligible participants received an introduction letter explaining the study and research consent form to take home. Parents who were interested in the study signed and returned the consent form, providing their names and contact information to the DNP student.

**Project Design**

Multiple methodologies including a pre and post questionnaire, DMAIC, and face to face education intervention were utilized for this capstone. A total of ten overweight and/or obese African American and Latino American children finished the intervention. To be eligible for
participation, children were: (1) 10 to 18 years old; (2) had a body mass index (BMI) percentile above the 85th percentile, as defined by the Centers for Disease Control (CDC); (3) self-identified as African American or Latino; (4) lived with at least one parent in the same household; (5) able to speak and read English. In addition, the child's parents were able to speak English (6) parents signed consent to allow participation of the child in the educational intervention and (8) parent and child agreed to attend all five sessions of the program.

A pre and posttest design was used with outcome measures including BMI percentile and physical activity and nutrition knowledge. In addition to the face to face meetings, a weekly 30 minutes follow up phone call was used to monitor the child’s progress and to clarify any questions the family might have. Participants were scheduled weekly to come to the office with their parent to attend the education class. Every week a topic from the teaching plan was used to discuss key healthy habit point.

The first session was used discuss the program’s goals and objectives. The child’s demographical data including age, gender, grade and race was obtained. Participants weight and height was obtained using AAP guideline on proper pediatric weight and height measurement. Each child was asked to choose one goal that they were willing to change which was question ten on the questionnaire. All participants received a journal and were told to keep a record of their daily food consumption as well as a daily record of their activities such as sleep time, video and TV watching time and how much drinks they drank. The first day was also used to obtain the parents baseline understanding of what BMI means and a measurement of the parents knowledge of their child’s BMI status and its implication.

Each subsequent session addressed specific ways the participant can attain their goal. For example, one participant chose a goal of “eating less fast food,” the DNP student then focused
the teaching to address how cooking more meals at home can reduce the need to eat fast food. Beneficial effects of the intervention included decreased BMI percentile and increased knowledge regarding healthy nutrition and physical activity. This project provided further support that healthy habit education can result in improved outcomes with childhood obesity.
Results, Findings, and Data Analysis

Table: 1 Participant Sample and Demographic Data:

Let’s go Demographic Data

<table>
<thead>
<tr>
<th>Participant Number</th>
<th>Age</th>
<th>Gender</th>
<th>Race</th>
<th>Education</th>
<th>Height</th>
<th>Pre-weight BMI</th>
<th>Post-weight BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17</td>
<td>Male</td>
<td>Hispanic</td>
<td>10th Grade</td>
<td>5'7.72&quot;</td>
<td>252lbs 38.6</td>
<td>251 38.5</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
<td>Female</td>
<td>Hispanic</td>
<td>9th grade</td>
<td>5'0.24&quot;</td>
<td>147.6lbs 28.6</td>
<td>147.2lbs 28.5</td>
</tr>
<tr>
<td>3</td>
<td>13</td>
<td>Female</td>
<td>Hispanic</td>
<td>7th Grade</td>
<td>5'1.42&quot;</td>
<td>142.4lbs 26.5</td>
<td>142.3lbs 26.5</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
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<td>Hispanic</td>
<td>6th grade</td>
<td>4'9.87&quot;</td>
<td>129lbs 27.1</td>
<td>129lbs 27.1</td>
</tr>
<tr>
<td>5</td>
<td>18</td>
<td>Female</td>
<td>African American</td>
<td>freshman college</td>
<td>5'2.6&quot;</td>
<td>305lbs 54.7</td>
<td>305lbs 54.7</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
<td>Female</td>
<td>African American</td>
<td>9th grade</td>
<td>5'0.63&quot;</td>
<td>158lbs 30.2</td>
<td>157.4lbs 30.1</td>
</tr>
<tr>
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<td>Hispanic</td>
<td>5th grade</td>
<td>5'1.02&quot;</td>
<td>156.2lbs 29.5</td>
<td>156lbs 29.5</td>
</tr>
<tr>
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<td>Hispanic</td>
<td>6th grade</td>
<td>4'11.45&quot;</td>
<td>156.4lbs 31.1</td>
<td>156.3lbs 31.1</td>
</tr>
<tr>
<td>9</td>
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<td>African American</td>
<td>10th grade</td>
<td>5'2.99&quot;</td>
<td>169lbs 29.9</td>
<td>168.6lbs 29.9</td>
</tr>
<tr>
<td>10</td>
<td>12</td>
<td>Female</td>
<td>African American</td>
<td>6th grade</td>
<td>4'10.66&quot;</td>
<td>152lbs 31.1</td>
<td>151.8lbs 31</td>
</tr>
</tbody>
</table>

The participant sample was comprised of ten children, 10-18 years of age. The sample was comprised of four males and six females. Four of the participants were African American
females four were Hispanic adolescent males (n=4), and two Hispanic adolescent females (n=2). The mean age of the participants was 14 years. The participant’s education ranged from 6th grade to 10th grade. The participants included 60% of high school students, 30% of the participants were middle school students and one participant was a college freshman. The mean BMI was 31.

Barriers noted with recruitment included finding enough participants for the intervention. Despite the fact that the DNP student put flyers in the lobby of the office, it was difficult recruiting more than ten participants to engage in this capstone. The participants school schedule and busy after school activities were a barrier. The participants were mostly middle and high school students and attend school from 7am to 3pm. The time frame only allowed the children to come to the clinic after 3pm. The initial sample included 13 participants, but three dropped out due to time constraints.

Sources of Data

Data used for the analysis was obtained from completed pre and post answers of the healthy habit questionnaire (Appendix B). The questionnaire answers were entered into Excel software. Other sources of data obtained included demographic information of the participants. Pre and post anthropometric measurements such as participant’s height and weight and calculated BMI status were all obtained for statistical analysis. The step up and go childhood obesity program analyzed the healthy habit questionnaire and assigned numerical values to answers one through eight (stepupandgo.org, 2015). Each answer was categorized as high risk, low risk and healthy habits. The questions with yes and no answers were assigned as yes (high risk) and no for (healthy habit).
Data Analysis

The Six Sigma (DMAIC) quality improvement method was utilized as a guide for the Data analysis. With DMAIC method problems are defined, measured, analyzed, improved and controlled. To identify if there was an improvement in healthy habit, the DNP student performed a two way paired T-Test, which showed that the number of healthy behavior increased significantly with a p value of (.0161). Identifying the gaps allows for policies or measures to be put in place to ensure success (Ransom, et al., 2008).

Figure 2: Comparison of participant’s healthy behaviors on the pre and post questionnaires answers.

A T-test was used to compare the before and after responses to the healthy habit questionnaire to see if there had been a significant increase in knowledge after the intervention, P value=.0161. As stated before the healthy questionnaire asked a 10 questions items shown in (Table 2) asking the children about their healthy habits such as (number of vegetables and fruits eaten per day, how much water they drank, how much they were engaged in physical activity,
how much time they spent watching TV/games, and how long they sleep). The questions were rated as healthy habit, high risk habits and low risk habits. The habits were assigned scores. Each participant was scored pre and post intervention.

**Figure 3: Comparison Participants High Risk Behavior Before and After Intervention**

A paired 2 way T-test was used to compare the difference between the pre and post survey. A p value of 0.084 was noted. The DNP students noted that the participants high risk behavior did not change much post intervention. One of the reasons suggested by the children was that part of the time frame of the intervention was during spring break. The children stated that they were home and “bored” so they watched television and played video games for a long time. During the final evaluation and summary of the capstone, the DNP student discussed effective strategies for the parents to engage the children during closed school. Effective strategies discussed with parents to engage the child in healthy habits include visiting a museum, going on a trail, visiting a zoo, or participating in sports camps.
Both genders showed a decrease in overall high risk behaviors after the intervention. All the participants received similar education on healthy habits. The participants’ post intervention ate more fruits, increased number of times they ate breakfast, drank more water and less soda and whole milk, increased their physical activity time and spent less time playing video games.
Although a reduction in BMI was not the goal of this translation project, it is important to note that measuring BMI and early recognition and management of a child’s weigh issues is one of the most recommended effective strategies in preventing childhood obesity. The mean BMI for the participants in this capstone intervention was 31. The participant’s pre and post BMI status was statistically not significant in due to the short duration of the intervention. Weight reduction involves multifaceted approach and requires having the knowledge and tools to maintain a healthy lifestyle. The parents were asked at the beginning of the intervention about their child’s BMI status and the meaning of what it implied. None of the parents in this intervention were able to effectively explain what their child’s BMI status indicated. The DNP student educated the parents on BMI using the CDC growth chart and BMI percentile chart for boys and girls.
Figure 6: Participants pre and post intervention BMI by Gender

Figure 6: The average BMI for males’ pre and post intervention was 31.5. The average BMI for females pre and post intervention was 33.5 BMI comparison between males and females showed an average of 32.5. A two way T-test was done to compare both genders post intervention BMI. There was no significant difference noted between both genders with a (p value =.0367). It is important to note that both boys and girls have different CDC BMI chart. Research shows that there are differences in body mass and body fat composition for boys and girls. For this research however, the goal was to promote healthy message to both the boys and girls by educating both genders on health habits such as choosing healthy food choices, promoting physical activities and avoiding sugary drinks.

Effect of the 5210 Program

The descriptive analysis for the 5210 program which was to promote healthy habit message to children age 10-18 following the obesity educational intervention was met. The
following outcomes following the educational intervention identified that 100% of the parents understood the meaning of BMI and what their child’s BMI meant. Parental knowledge of a BMI percentile chart was measured pre and post intervention. Pre intervention, only 40% of the parents understood fully what BMI percentile for their child was. Post counseling and teaching 100% of the parents understood what their child’s BMI signified.

More than 50% of the participants stated that they ate more fruits and vegetables. Participants that had TV or computer in their room chose to not take it out take the TV out of the bedroom but there were parental restrictions on times the TV could stay on. More than 50% of the participants improved on the number of times they spent being active outside. More than 50% of the participants switched to nonfat (skim) or low-fat (1%) milk within two months post intervention.

Over 50% of the participants stated that they spent less time watching TV/movies and playing video/computer games except the period when they were on spring break. The goal of eating less will eat less fast food/takeout decreased but the participants were still eating fast food at least twice a week. More than 50% of the participants drank less soda, juice, or punch within two months post intervention. More than 50% of the participants drank more water within two months post intervention and 100% of the participants was not able to meet the goal of eating dinner as a family every night. Finally the children improved on the number of times they ate healthy breakfast within two months post intervention.

**Discussion and Findings**

The themes identified in this research translation project reflect the findings in the literature review. Several studies in the literature have attributed parental factors such as socioeconomic status, parental efficacy, and parental cultural as contributors to childhood
obesity. Other factors that affect childhood obesity include, snack choices, nutrition, physical activity level, and consumption of sugary drinks. Environmental factors such as crime ridden neighborhood, lack of Park and recreational facilities, food choices in schools and poverty are also contributory factors.

This evidence based intervention demonstrated that although treatment for obesity is challenging and complex, there are many strategies that can be employed by providers in primary care to address childhood obesity. This evidence-based intervention demonstrated that although treatment for obesity is challenging and complex, there are many strategies that can be employed by providers in primary care to address childhood obesity.

Dorothy Orem’s self-care deficit theory was used to implement this research translation. Orem’s theory proposes that humans should be able to perform self-care activities and where the patient fails to maintain self-care skill; nurses should step in and bridge the gap (Orem, 2001). Managing one’s weight requires self-discipline and guidance. In the case of children and adolescents, parental guidance and participation is needed. Parents buy the groceries in the house, parents make the choice to put computer or television in their child room and parents have to provide opportunity for their child to participate in physical activities by taking the child to a park.

Primary care providers can promote and address the basic education on healthy habits. Basic 5210 program implementation focuses on promoting healthy habit message to children. Healthy habits such as eating five or more servings of vegetables a day, reducing screen time to less than two hours a day, increasing daily physical activity to more than one hour and drinking zero sugary drinks are interventions that are known to promote healthy weights. All the participants did not meet the guidelines recommended by the AAP in the initial questionnaire.
One noted common answer was the amount of time the kids spent watching television or playing with their video games. All the participants were watching television or playing video games over two hours a day. One participant stated that he spent over four hours after school playing video games. The ten questions on the questionnaires gave insights on the kid’s normal habits at home. The questions that asked if the child had television or computer in their rooms created a prompt for the parents to participate more and also for the parents to realize that they have to provide a healthy environment for the child.

For childhood obesity outcome to be successful, parental participation and parental awareness about lifestyle modifications and knowledge is a necessity. Although the amount of healthy behavior increased, (Figure 4), BMI did not significantly decrease. This was probably due to the time frame of the intervention. Overall, findings from this capstone support the fact that childhood obesity risk factors can be modified with clinical support, education and referral to a nutrition specialist. It also supports the need for primary care providers to engage patients and families to promote healthy lifestyle and prevent and manage obesity.

**Evaluation and plan for post project continuation**

The evaluation plan for this research translation involves a multi method approach. The plan will involve putting in place measures and benchmark that allows the office to monitor and sustain the 5210 program’s implementation plan, the office manager will act as the auditor who will create and maintain the office environment by making sure the lobby and practitioner’s office has a visible 5210 poster with the displayed healthy habit message.

In order to have a quantitative value of the office progress with promoting the 5210 healthy habit message, the office manager will employ a data collection tool that involves periodic chart review. Ten charts will be randomly selected every six months to track if, 1) There
is documented BMI status, 2) If the practitioners are utilizing the 5210 questionnaires. The goal is to have 100% of the audited chart be in compliance with the 5210 goals and objectives.

**Limitation**

The primary limitation in this project is the sample size, and the initial parameter of 95 or greater percentile for inclusion. Due to the limited timeframe for recruitment, the inclusion criteria were extended to include 10-18 year olds with a BMI percentile greater than 85 percentile or above. The original intent of this project was to include children age 2-18 years, but due to the short timeframe of this project and the developmental challenges that children age 2-9 present, it was not feasible to include this age group in the proposal.

Another limitation noted in this project is the use of convenience sample. Another Participants who were most ready to change were more willing to sign up for this implementation. Limitations were noted with the use of the questionnaire as the questions needed to be clarified in simple words that the kids can understand. The DNP student initially had thirteen participants but three dropped out due to factors such as after school activity, transportation issues and lack of commitment.

**Implications for practice**

The increasing complexity of the health care environment coupled with the difficulty of managing chronic diseases such as childhood obesity necessitate the role and importance of a Doctorate Prepared Nurse (Zaccagnini, & White, 2014). Health care is over burdened with complex diseases, requiring more advanced case management, more specialized patient care, advanced technology, need for advanced leadership, need for research and collaboration with other health care providers. All of these complexities demand advanced knowledge and education. Health care organizations will benefit from having an advanced nurse practitioner
with the clinical and critical thinking skills that is required to manage complex and chronic issue such as childhood obesity. Although significant gaps exist in the research on childhood obesity interventions, several conclusions can be drawn based on the findings in this capstone. The 5210 program can be an effective strategy used for obesity intervention in primary care. Its implementation requires dedicated office staff and time commitment. A separate office visit will need to be scheduled for counseling because a well or ill office visit might not be sufficient time to speak to the parent or child. Follow-up with an outside practitioner like a nutritionist or obesity clinic might need to be done if the office does not have the staff to fulfill this role.

It is clear that significant barriers exist for optimal obesity intervention among children. Factors such as parental efficacy, beliefs and attitudes, feeding and nutritional factors, lack of physical exercise, economic factors and lifestyle factors are all identified indicators that relate to obesity intervention. It is also necessary that any childhood obesity intervention involve the parent child dyad for effective outcome. Current guidelines from the American Academy of Pediatrics recommends that primary care providers conduct universal BMI screening of all children in order to improve early identification of obesity factors such as time, lack of access to electronic medical records, and staffing shortages and poor provider reimbursement have all been cited as barriers to achieving this guideline.

Conclusion

The impact and consequences of childhood obesity cannot be understated. Early recognition and management of a child at risk for becoming overweight is the key to reducing childhood obesity. Children who are obese are at risk for numerous health complications such as heart disease, diabetics, high blood pressure, sleep apnea, high cholesterol, fatty liver disease, gall stones, and gastrointestinal disease such as reflux. Children who are overweight or obese are
also at risk for social and psychological problems such as social discrimination and low self-esteem. Obese children are also at risk for developing obesity in adulthood.

The American Academy of Pediatrics (AAP) recommends that all children be monitored and screened for BMI. Although obesity management is difficult and complex to manage, evidence suggests that successful obesity intervention can be done. Practitioners have to put a plan in place for management and referral of patients who are overweight or obese. Children can be referred to an obesity clinic or a nutritionist if the practice is not staffed to fully implement the suggested AAP guideline for pediatric obesity.

Finally, this project identified preventive strategies that providers can use to promote and create awareness about healthy habit behaviors leading to increased knowledge. About obesity prevention in children. Healthy habits such as eating at least five servings of fruits and vegetables a day, reducing screen time to two hours or less, engaging in at least one hour of physical activity a day and drinking zero sugary drinks are all recommended strategies to fight childhood obesity.
References


Weekly Report. Retrieved from
http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6231a4.htm


Centers for Disease Control. National Health and Nutrition Examination survey data. Hyattsville, MD : US Department of Health and Human Services, CDC;


Step up and Go: Pediatric toolkits. Accessed April 15th, 2015 from
https://stepupandgo.org/uploadedFiles/85210_Campaign/Pediatric%20Toolkit%20for%20website(1).pdf


US Department of Commerce, United Stated Bureau of Census: State and County Facts (2014)


Appendix:  A: Letter to Parents

Sandra Anyoha, RN, MSN, MPH, DNP©
Modern Era Pediatric Practice
3751 Main Street, BPT, CT 06606
203-371-4800(p) 203-521-5434© Fax-203-371-4900
sanyoha@sbcglobal.net
02/10/2015

Dear Parent,

My name is Sandra Anyoha. I am a University of Massachusetts Doctor of Nursing Practice Student in the Family Nurse Practitioner program. I am working on a capstone project on childhood obesity intervention this semester. My project focuses on using the American Academy of Pediatrics guideline called Lets Go! 5210 program developed at the Barbara Bush Maine Children’s Hospital to help children keep a healthy weight. The program encourages eating five or more vegetable a day, two or less hours of TV time per day, no sugary drinks and at least one hour or more of physical activity. This project will take place over three months and will require your commitment to make it work. It will require that you and your child attend a two hour weekly education session lasting over a five week period. Participation in this research proposal is completely confidential. You and child’s information and privacy will remain protected. By signing this form, you agree to participate and attend all sessions. Thank you!

Childs full name---------------------------------------------

Parent (Guardian name) print----------------------------------

Parent signature -------------------------------------------

Date-------------------------- Parent Contact number-------------------
Appendix:  B - 5210 Healthy Habits Questionnaire (Ages 10–18)

We are interested in the health and well-being of all our patients. Please take a moment to answer the following questions.

Patient Name: __________ Age ________ Today’s Date __________

1. How many servings of fruits or vegetables do you eat a day?
   (One serving is most easily identified by the size of the palm of your hand.) __________

2. How many times a week does your child eat dinner at the table?
   Together with the family? __________________________

3. How many times a week do you eat breakfast? __________________________

4. How many times a week do you eat takeout or fast food? __________________________

5. How many hours a day do you watch TV/movies or sit and play video/computer games? __________________________

6. Do you have a TV in the room where you sleep? Yes _____ No_______

7. Do you have a computer in the room where you sleep? Yes ___ No_______

8. How much time a day do you spend in active play
   (Faster breathing/heart rate or sweating)? __________________________

9. How many 8-ounce servings of the following do you drink a day?
   _____ Soda or punch _____ Nonfat (skim), low-fat (1%), or reduced-fat (2%) milk
   _____ Fruit or sports drinks _____ Whole milk _____ 100% juice _____ Water

10. Based on your answers, is there ONE thing you would be interested in changing now? Please check one box
    Eat more fruits and vegetables___ Take the TV out of the bedroom.____ Play outside more often. ___
    Switch to nonfat (skim) or low-fat (1%) milk. ___
    Spend less time watching TV/movies and playing video/computer games. ___
    Eat less fast food/takeout. ___ Drink less soda, juice, or punch. ___ Drink more water. ___

Please give the completed form to your clinician. Thank you.

Adapted from Let’s Go! Maine Website
Appendix: C - BMI Chart for Boys 2-20 years

2 to 20 years: Boys
Body mass index-for-age percentiles

<table>
<thead>
<tr>
<th>Date</th>
<th>Age</th>
<th>Weight</th>
<th>Stature</th>
<th>BMI*</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*To Calculate BMI: Weight (kg) ÷ Stature (cm) ÷ Stature (cm) x 10,000
or Weight (lb) ÷ [Stature (in) ÷ 10]² x 703

Published May 30, 2000 (modified 16/11/00)
SOURCE: Developed by the National Center for Health Statistics in collaboration with
the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts
Appendix:  D - BMI CHART FOR GIRLS 2-20 YEARS
APPENDIX: E CHILDHOOD OBESITY EVALUATION FORM

1. What did you enjoy about the educational session?
________________________________________________________________________

2. Do you feel the time was enough?
________________________________________________________________________

3. Do you feel you learned anything in this program?
________________________________________________________________________

4. Any suggestions for future class?
________________________________________________________________________

5. What did you like or not like about the sessions?

   Comments or suggestions?

---------------------------------------------------------------------------------------------------------------------------------------
## APPENDIX: F PROJECT TIMELINE

<table>
<thead>
<tr>
<th>Task</th>
<th>January 2015</th>
<th>February 2015</th>
<th>March 2015</th>
<th>April 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval of DNP Capstone</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recruitment of Stakeholders</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preceptor Agreement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stakeholders Agreement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning of project</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meeting with stakeholders</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Collection Meeting with stakeholders</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Project Implementation Meeting with stakeholders</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Data Analysis</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Meeting with stakeholders</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
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<tr>
<td>Project write-up</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
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<tr>
<td>Project presentation to stakeholders</td>
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<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX: G
DMAIC (Six Sigma Quality Improvement Tool)

1. Defining Background (What is it that you are setting up/talking about?)
   Questions to Answer                              Tools to Use
   What is the problem?                           1. Problem Statement
   Why is it a problem?                           2. Project Charter
   What is the importance of the problem?
   What is the objective?

2. Current Conditions (Where do things stand today/What is the problem?)
   Questions to Answer                              Tools to Use
   What is the current situation?                   1. Current State
   Why about the system is not ideal?              2. Project Map

3. Measure/Analyze (What is the root cause of the problem?)
   Questions to Answer                              Tools to Use
   What is the essential baseline data?            1. Fishbone Diagram
   What are the defects and variations?           2. Root Cause Analysis (5 Why's)

4. Goals/Targets (What specific outcomes are required?)
   Questions to Answer                              Tools to Use
   What is the goal of the project?                1. SMART goals
   When will the goal be attained?                2. (Projected time frame)

5. Counter Measures to Improve Process
   (What is your proposal to reach the future state or target condition?)
   Questions to Answer                              Tools to Use
   What are some possible solutions?              1. Future State Process Map
   How can work flow be standardized?
   What are the required actions to move from current state to target
   condition?
APPENDIX: H - DMAIC-IMPLEMENTATION PLAN
(What activities will be required to implement? Who will be responsible? For what? And when?)

<table>
<thead>
<tr>
<th>What? (...are the actions to be taken)</th>
<th>Who? (...is the responsible person)</th>
<th>When? (expected completion date/time)</th>
<th>Expected Outcomes &amp; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
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<tr>
<td>2.</td>
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<tr>
<td>3.</td>
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<td></td>
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<tr>
<td>4.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX I: FOLLOW-UP / CONTROL PLAN

(What issues can be anticipated/ How will you check effects and for How long?)

Questions to Answer:

Who will check the new process?

What measure or test will be used?

When will the follow-up be conducted?

How do the results compare to predicted outcomes?
### Appendix J Patient Discussion Points

<table>
<thead>
<tr>
<th>Discussions Point</th>
<th>Brochure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>How many servings of fruits or vegetables do you eat a day?</strong></td>
<td><em>Let’s Go Brochure on</em></td>
</tr>
<tr>
<td>5 or more servings of fruits or vegetables per day help provide a healthy diet.</td>
<td>“Eat at least five fruits and vegetables a day”</td>
</tr>
<tr>
<td><strong>The palm of the child’s hand is a good reference for a serving size for meat and protein and most vegetables. A more accurate guide for each meal is:</strong></td>
<td><em>Let’s Go ! brochure on</em></td>
</tr>
<tr>
<td>3 ounces of protein, such as chicken, lean meat, fish, tofu, or 2 tablespoons of peanut butter</td>
<td>“What’s a Healthy Portion”,</td>
</tr>
<tr>
<td>½ cup to 1 cup of a starch, such as pasta, potato, rice, or 2 slices of bread</td>
<td></td>
</tr>
<tr>
<td>½ cup to 1 cup of vegetables</td>
<td></td>
</tr>
<tr>
<td>½ cup or one small piece fresh fruit</td>
<td></td>
</tr>
<tr>
<td>1 cup milk or 1–2 ounces of low fat cheese</td>
<td></td>
</tr>
<tr>
<td><strong>“To Have Fruits and Veggies Year-Round,</strong> Add Frozen or Canned**, “Fuel Learning with Fruits and Vegetables” and “Encourage Kids to Eat More Fruits &amp; Veggies”**</td>
<td>*Let’s Go Brochure on “Eat at least five fruits and vegetables a day”</td>
</tr>
<tr>
<td><strong>How many times a week do you eat dinner at the table together with your family?</strong></td>
<td><em>Let’s Go Brochure “A Meal is a Family Affair”</em></td>
</tr>
<tr>
<td>Family meals are associated with an increased intake of fruits, vegetables, and milk. Encourage families to eat meals together more often. Mealtime is a great opportunity for parents to connect with their kids.</td>
<td></td>
</tr>
<tr>
<td><strong>How many times a week do you eat breakfast?</strong></td>
<td><em>“Healthy Favorites: A booklet full of healthy tips and recipes”, “Tasty Snacks for Healthy Kids”, “Snacking Tips for Healthy Kids”,</em></td>
</tr>
<tr>
<td>Daily breakfast is very important for a healthy diet. Skipping breakfast may be a risk factor for obesity.</td>
<td></td>
</tr>
<tr>
<td><strong>How many times a week do you eat takeout or fast food?</strong></td>
<td></td>
</tr>
<tr>
<td>Eating takeout or fast food may be associated with obesity. These foods have a</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
tendency to be fattier so children should eat them less often. If children do eat takeout or fast food, they should look for healthy options.

**How many hours a day do you watch TV/movies or sit and play video/computer games?**
- **Do you have a TV in the room where you sleep?**
- **Do you have a computer in the room where you sleep?**

The American Academy of Pediatrics recommends the following: 2 hours or less of recreational screen time. They also recommend: no screens in the child’s bedroom and no TV or computer under the age of 2.

**How much time a day do you spend in active play (faster breathing/heart rate or sweating)?**
1 hour or more; the time spent doing physical activity can be separated out throughout the day.

**How many 8-ounce servings of the following do you drink a day?**
- **100% juice:**
  - 4–6 ounces for children 1–6 years old
  - 8–12 ounces for children 7–18 years old
- **Water:** unlimited
- **Fruit or sports drinks:** limited—you can use this opportunity to have a conversation about when a sports drink is needed (after 60 minutes of continuous vigorous activity). Soda or punch: limited

“Healthy Shopping on a Budget”, “The Fittest Food” and

**Let’s Go! brochure on “Limit recreational TV or computer use to two hours or less”**

**Let’s Go! brochure on “Get one hour or more of physical activity everyday.”**

**Let’s Go! brochure on “Drink less sugar; try water and low fat milk instead of soda and drinks with lots of sugar”**
# LITERATURE REVIEW TABLE MATRIX

<table>
<thead>
<tr>
<th>Author /Title</th>
<th>Year</th>
<th>Type of research or (Non-research) evidence</th>
<th>Sample size/location</th>
<th>Results</th>
<th>Limitation Strength</th>
<th>Strength / Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gorin, Wiley, Ohanesian, Hernandez, Grant and Cloutier Steps to Growing Up Healthy: a pediatric primary care based obesity prevention program for young children.</td>
<td>2014</td>
<td>Randomized trial protocol</td>
<td>150 mother-child dyads for 12 months from an inner city pediatric primary care center</td>
<td>A reduction in child’s BMI at 12 months post intervention.</td>
<td>Study protocol/ Based on evidence based randomized trial and AAP guideline</td>
<td>1/A</td>
</tr>
<tr>
<td>Grossklaus and Marvicin Parent and child weight status predict weight-related behavior change. Journal Of Communication In Healthcare</td>
<td>2014</td>
<td>Systemic review</td>
<td>Six articles relating to parental competence and nine articles relating to parental efficacy. In addition, four articles looked at parenting and eating behavior was examined.</td>
<td>Understanding parental eating behavior will assist the provider with planning interventions to encourage healthy family lifestyles.</td>
<td>The authors acknowledge that further studies are needed to develop scales and questionnaires that involve nursing care assessment, parenting and eating behaviors in children.</td>
<td>III/B</td>
</tr>
<tr>
<td>Accurso, Norman, Crow, Rock,</td>
<td>2014</td>
<td>Meta-synthesis</td>
<td>Fifty 8- to 12-year-old children with This study suggests that motivation</td>
<td>Findings limited to Latino</td>
<td></td>
<td>III/B</td>
</tr>
<tr>
<td>and Boutelle</td>
<td>The role of motivation in family-based guided self-help treatment for pediatric obesity.</td>
<td>overweight and obesity (BMI percentiles 85-98%) and their parents participated in a guided self-help weight loss program, which included 12 brief sessions across 5 months.</td>
<td>may be an important predictor of reduced BMI in child obesity treatment, with sustained motivation being more important than initial motivation.</td>
<td>children and parents.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tipton</td>
<td>Caregivers’ psychosocial factors underlying sugar-sweetened beverage intake among non-Hispanic black preschoolers: an elicitation study.</td>
<td>19 caregiver’s beliefs and perceptions and its contributory effect on their child’s weight status were examined.</td>
<td>The study identified factors that leads parents to serving SSBs and includes factors such as convenience, cost, taste, potential health consequences, availability, and pressure from other parents.</td>
<td>Qualitative research ‘Might not be replicable. Relevant to treatment and prevention of obesity.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Sung-Chan, Sung, Zhao, and Brownson. | Family-based models for childhood-obesity intervention: a systematic review | 15 randomized controlled trials (RCTs) of family-based lifestyle interventions for children and adolescents aged 2-19. | Family-based interventions rooted in behavior theory achieved better results than those theoretically connected to family. | The 15 RCT’s used for the review had different outcome measures / The review supports that family based interventions’ are effective childhood
<table>
<thead>
<tr>
<th>Study</th>
<th>Method</th>
<th>Findings</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weatherspoon, Venkatesh, Horodynski, Stommel, and Brophy-Herb</td>
<td>Cross-Sectional Study</td>
<td>The authors compared the food patterns and mealtime behaviors of 199 low income and 200 non-Hispanic white Mothers enrolled in an early start program in a mid western state. Findings from this cross-sectional study indicated that socio-economics, demographic area, marital factors, and race, are important components in childhood obesity among low income families.</td>
<td>Strength of the study was the Sample size. Participants were 400 mother child dyads. Limitation is that the researchers only observed one meal was observed.</td>
</tr>
<tr>
<td>Tschann, Gregorich, Penilla, Pasch, de Groat, Flores, &amp; Butte.</td>
<td>Cross-Sectional</td>
<td>Participants were children aged 8-10 born to mothers of Mexican origin in the USA. The researchers used a culturally-based approach to measure and identify parental feeding practices. The results revealed parental feeding practices: positive involvement in child eating, pressure to eat, use of food to control behavior, and restriction of amount of food as having effect on the child’s weight.</td>
<td>Findings are limited to immigrant Mexican American families and cannot be generalized.</td>
</tr>
<tr>
<td>Leary, Ice, Neal &amp; Cottrell</td>
<td>cross-sectional study</td>
<td>Families in the “Coronary Artery Risk Detection in Appalachian Communities” showed that parental perception of</td>
<td>Limitations to this study include the recruitment method which was limited to</td>
</tr>
<tr>
<td>Status predict weight-related behavior change. Journal of Communication in Healthcare, Bleich, Segal, Wu, Wilson, &amp; Wang. Systematic review of community-based childhood obesity prevention studies.</td>
<td>Project” and Students in kindergarten, second, fifth, and eight grade in West Virginia public schools for their survey were eligible for the study.</td>
<td>The literature suggested that combined diet and physical activity intervention conducted in the community with school setting combination greatly helps in obesity reduction among children. The authors noted that consistent methodology are needed to understand the effectiveness of childhood obesity prevention programs in the community setting.</td>
<td>2013 Systemic Review Community-based childhood obesity prevention studies.</td>
</tr>
<tr>
<td>Authors</td>
<td>Year</td>
<td>Study Type</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------</td>
<td>---------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Wansink, Shimizu and Brumberg</td>
<td>2013</td>
<td>Randomized Controlled Trial</td>
<td>Two hundred and one children were recruited for the study (115 girls) entering the third to sixth grades were randomly assigned to 1 of 4 snacking conditions: (1) potato chips only, (2) cheese-only, (3) vegetables only, and (4) cheese and vegetables. Children consumed 72% less calories when eating a combined snack as opposed to when they were served potato.</td>
</tr>
<tr>
<td>Keane, Layte, Harrington, Kearney, and Perry.</td>
<td>2012</td>
<td>Cross-sectional</td>
<td>The research participants included 8568 school children in Ireland obtained from school settings. Cross-analysis of Growing Up in Ireland (GUI) which looked to identify if parental weight, and socio-economic factors is a risk factor for obesity in nine year old children.</td>
</tr>
<tr>
<td>Basch</td>
<td>2011</td>
<td>Meta-Analysis</td>
<td>School based physical activity interventions were reviewed. The result of the literature review reveal that large</td>
</tr>
<tr>
<td>Study</td>
<td>Year</td>
<td>Design/Trial</td>
<td>Sample Size</td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Ruiz</td>
<td>2011</td>
<td>Randomized Study</td>
<td>106 Hispanic parents in Nashville, TN were recruited for the study. Study was done in a community health center.</td>
</tr>
<tr>
<td>Perrin, Rothman, Sanders, Skinner, Eden, Shintani, and Yin.</td>
<td>2014</td>
<td>Randomized Trial</td>
<td>863 parents of which 50% were Hispanic, 27% Black, and 18% White were recruited for the study. Parental reports of feeding habits in regards to their 2-month olds were examined.</td>
</tr>
<tr>
<td>Wojcicki and Heyman</td>
<td>2012</td>
<td>Non research/Article</td>
<td>No sample involved</td>
</tr>
<tr>
<td>Reducing Childhood Obesity by Eliminating 100% Fruit Juice</td>
<td>accordance with the US Department of Agriculture's Child and Adult Food Care Program, which recommends whole fruits for children as opposed to fruit juice</td>
<td>outlining recommendation of dietary intake of children based on AHA and AAP guidelines.</td>
<td></td>
</tr>
</tbody>
</table>
Let’s go Demographic Data

<table>
<thead>
<tr>
<th>Participant Number</th>
<th>Age</th>
<th>Gender</th>
<th>Race</th>
<th>Education</th>
<th>Height</th>
<th>Pre-weight</th>
<th>Post-weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17</td>
<td>Male</td>
<td>Hispanic</td>
<td>10th Grade</td>
<td>5’7.72”</td>
<td>252lbs</td>
<td>251lbs</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38.6</td>
<td>38.5</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
<td>female</td>
<td>Hispanic</td>
<td>9th Grade</td>
<td>5’0.24”</td>
<td>147.6lbs</td>
<td>147.2lbs</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>28.6</td>
<td>28.5</td>
</tr>
<tr>
<td>3</td>
<td>13</td>
<td>Female</td>
<td>Hispanic</td>
<td>7th Grade</td>
<td>5’1.42”</td>
<td>142.4lbs</td>
<td>142.3lbs</td>
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<td>15</td>
<td>Female</td>
<td>African American</td>
<td>10th Grade</td>
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</tr>
<tr>
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<td>Participant 2</td>
<td>Participant 3</td>
<td>Participant 4</td>
<td>Participant 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many servings of fruits or vegetables do you have daily?</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many times a week do you eat dinner with your family?</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many times a week do you eat breakfast?</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td></td>
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<tr>
<td>How many times a week do you eat fast food?</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many hours of television do you watch each day?</td>
<td>2 hours or more</td>
<td>4 hours</td>
<td>1 hour</td>
<td>1 hour</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there a television in your bedroom?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there a computer in your bedroom?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many 8-ounce servings of the following do you drink daily?</td>
<td>• Water</td>
<td>• 100% juice</td>
<td>• 100% juice</td>
<td>• 100% juice</td>
<td>• Water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Fruit or sports drinks</td>
<td>• Water</td>
<td>• Fruits or sports drinks</td>
<td>• Water</td>
<td>• Water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Skim, 1%, or 2% milk</td>
<td>• Whole milk</td>
<td>• Whole milk</td>
<td>• Whole milk</td>
<td>• Whole milk</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Whole milk</td>
<td>• Soda</td>
<td>• Soda</td>
<td>• Soda</td>
<td>• Soda</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Nonfat, low-fat, or reduced fat milk</td>
<td>• 1% milk</td>
<td>• 1% milk</td>
<td>• 1% milk</td>
<td>• 1% milk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How much time you spend being active each day?</td>
<td>1 hour</td>
<td>1 hour</td>
<td>1 hour</td>
<td>0 hours</td>
<td>2 hours a week</td>
<td></td>
<td></td>
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<td>Questions</td>
<td>Healthy Habits Questionnaire (Ages 10-18) Pre-data</td>
<td></td>
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<td>-----------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many servings of fruits or vegetables do you have daily?</td>
<td>Participant 6</td>
<td>Participant 7</td>
<td>Participant 8</td>
<td>Participant 9</td>
<td>Participant 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many times a week do you eat dinner with your family?</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many times a week do you eat breakfast?</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many times a week do you eat fast food?</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many hours of television do you watch each day?</td>
<td>4 hours or more</td>
<td>4 hours or more</td>
<td>3 hour</td>
<td>4 hours</td>
<td>3 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there a television in your bedroom?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there a computer in your bedroom?</td>
<td>No</td>
<td>yes</td>
<td>yes</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many 8-ounce servings of the following do you drink daily?</td>
<td>Water</td>
<td>100% juice</td>
<td>100% juice</td>
<td>100% juice</td>
<td>100% juice</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fruit or sports drinks</td>
<td>Water</td>
<td>Water</td>
<td>Water</td>
<td>Water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skim, 1%, or 2% milk</td>
<td>Fruits or sports drinks</td>
<td>Whole milk</td>
<td>Whole milk</td>
<td>Whole milk</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Whole milk</td>
<td>Soda</td>
<td>100% juice</td>
<td>Soda</td>
<td>100% juice</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>sports drinks</td>
<td>Water</td>
<td>punch</td>
<td>Water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Whole milk</td>
<td>Whole milk</td>
<td>Whole milk</td>
<td>Whole milk</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soda or punch</td>
<td></td>
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<td></td>
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</table>
### Healthy Habits Questionnaire (Ages 10-18) Post-data

<table>
<thead>
<tr>
<th>Questions</th>
<th>Participant 1</th>
<th>Participant 2</th>
<th>Participant 3</th>
<th>Participant 4</th>
<th>Participant 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many servings of fruits or vegetables do you have daily?</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>How many times a week do you eat dinner with your family?</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>How many times a week do you eat breakfast?</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>How many times a week do you eat fast food?</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>How many hours of television do you watch each day?</td>
<td>2 hours or less</td>
<td>4 hours or more</td>
<td>3 hour</td>
<td>5 hours</td>
<td>3 hours</td>
</tr>
<tr>
<td>Is there a television in your bedroom?</td>
<td>yes</td>
<td>yes</td>
<td>No</td>
<td>yes</td>
<td>No</td>
</tr>
<tr>
<td>Is there a computer in your bedroom?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>How many 8-ounce servings of the following do you drink daily?</td>
<td>• Water</td>
<td>Water</td>
<td>• Water</td>
<td>• 100% juice</td>
<td>• Water</td>
</tr>
<tr>
<td>• Whole milk</td>
<td>Water milk</td>
<td>• Water</td>
<td>• Water</td>
<td>• Water</td>
<td></td>
</tr>
<tr>
<td>• Fruit or sports drinks</td>
<td>• Whole milk</td>
<td>• Soda</td>
<td>• Nonfat, low-fat, or reduced fat milk</td>
<td>• Soda</td>
<td></td>
</tr>
<tr>
<td>Questions</td>
<td>Healthy Habits Questionnaire (Ages 10-18) Post-data</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Participant 6</td>
<td>Participant 7</td>
<td>Participant 8</td>
<td>Participant 9</td>
<td>Participant 10</td>
</tr>
<tr>
<td>How many servings of fruits or vegetables do you have daily?</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>How many times a week do you eat dinner with your family?</td>
<td>4</td>
<td>3</td>
<td>2</td>
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</tr>
<tr>
<td>How many times a week do you eat breakfast?</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>4</td>
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<td>How many times a week do you eat fast food?</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>How many hours of television do you watch each day?</td>
<td>2 hours or more</td>
<td>2 hours or more</td>
<td>3 hour</td>
<td>2 hours</td>
<td>32 hours</td>
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<tr>
<td>Is there a television in your bedroom?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Is there a computer in your bedroom?</td>
<td>No</td>
<td>yes</td>
<td>yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>How many 8-ounce servings of the following do you drink daily?</td>
<td>• Water</td>
<td>• 100% juice</td>
<td>• 100% juice</td>
<td>• Water</td>
<td>• Water</td>
</tr>
<tr>
<td></td>
<td>• Water</td>
<td>• Water</td>
<td>• Water</td>
<td>• soda</td>
<td>• water</td>
</tr>
<tr>
<td></td>
<td>• Water</td>
<td>• Water</td>
<td>• nonfat, low-fat, or reduced fat milk</td>
<td>• soda</td>
<td>• Water</td>
</tr>
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