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The Effectiveness of a Multi-Component Community Program for the Prevention of Childhood Obesity

Katelyn Bailey

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THE EFFECTIVENESS OF A MULTI-COMPONENT COMMUNITY PROGRAM FOR THE
PREVENTION OF CHILDHOOD OBESITY

Katelyn Bailey

A Dissertation Submitted to the Graduate Faculty of
GRAND VALLEY STATE UNIVERSITY
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Dedication

I would like to dedicate this dissertation to all of my family and friends. Without your support, none of this would have been possible. To my husband, Joe, thank you for your support, love, and encouragement throughout this journey. Your patience, hard work, and flexibility kept us going. Thank you for keeping me grounded during the many stressful times, I appreciate all you have done for me so I could reach my professional goals. I would like to extend my deepest gratitude to my parents for their support and encouragement along the way. Mom, thank you for the constant reminders that someone was there cheering me on and for lending an ear when I needed to vent. To my brother and sister-in-law, I am forever indebted for the great hospitality and support you have provided me. To my “sister cousins,” thank you for being right by my side throughout this journey. Our weekends of fun and laughter were just what I needed to get away from the stress. To my grandparents and extended family, there are no words for the amount of love you have showered over me. I am beyond blessed to have your support. Finally, to my closest friends, thank you for sticking by my side.
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Abstract

Trends in childhood obesity have increased in the past several decades at an alarming rate. According to the CDC, there are 12.5 million children ages 2-19 years affected by the condition. There are many associated comorbidities to childhood obesity and they are negatively affecting our nation’s youth. Research supports childhood obesity prevention programs that are family-based, take place in the community, and include education about nutrition, physical activity, and behavior change. B. Healthy Families is a program designed to address the issue of childhood obesity in a rural county in the Midwest. It was a six week community-based program that involved the entire family. Families were recruited by local health care providers. A total of 12 families and 16 children participated in the program. For two hours each week, families attended sessions, held at the local YMCA focused on nutrition, physical activity, and behavior modification. In addition, they participated in physical activities. Effectiveness was measured. Quantitative data were obtained regarding knowledge, behaviors, and utilization of a healthy habits initiative. Qualitative data were collected through a phone interview using two questionnaires based on the Health Promotion Model (Pender, 2011). Wilcoxon Matched-Pairs Signed Rank Test revealed a significant improvement in the number of servings of fruits and vegetables children consumed each day. This was the only statically significant finding; however families did show slight improvements in several other healthy eating and physical activity behaviors. Future programs should provide further assistance to families regarding behavior modification and how to incorporate healthy eating and physical activity into their lives.
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CHAPTER 1
INTRODUCTION

Childhood obesity is negatively affecting our nation’s youth. Trends in childhood obesity have increased in the past several decades at an alarming rate. Since 1980, the number of children considered obese has nearly tripled, which has resulted in 12.5 million children ages 2-19 years affected by the condition (Centers for Disease Control and Prevention [CDC], 2013b). Body mass index (BMI) is a measure used by health care professionals and researchers to determine if a child is overweight or obese. It is calculated by dividing the child’s weight in pounds by their height in inches squared and multiplied by 703. For children and adolescents aged 2-19, a BMI at or above the 85th percentile is considered overweight and a BMI at or above the 95th percentile is considered obese (CDC, 2014). With nearly one in three children being overweight or obese, our nation is faced with a growing epidemic (Alliance for a Healthier Generation, 2013).

The above statistics indicate that children living in the United States are at risk for becoming obese. At even greater risk are those children living in rural communities. There have been surveys and research studies done that have indicated that children living in a rural community compared to an urban community are at greater risk for becoming obese (Davis, Bennett, Befort, & Nollen, 2011; Lutfiyya, Lipsky, Wisdom-Behounek, & Inpanbutr-Martinkus, 2007). Davis et al. (2010) found that significantly more rural children were obese than their urban counterparts. Lutfiyya et al. (2007) reported that children ages 5-17 living in a rural area were 25% more likely to be overweight or obese than their metropolitan counterparts.
They also determined that the children in the rural community were more likely to be white than non-white, live below or slightly above the poverty line, be uninsured, to not have received preventive care in the past 12 months, to use a computer for more than 3 hours a day unrelated to school work, and to watch television for more than three hours a day. All of these factors could be reasons why the rural children are found to be more overweight than urban children.

**Background/Significance**

**Causes of Childhood Obesity**

There are a number of factors that play a role in the development of obesity. Childhood obesity is a complex multifactorial phenomenon. A child’s weight can be influenced by his/her community, school, parents, environment, peers, culture, media, and food and beverage industries. These factors lead to obesity due to their influence on the child’s diet and level of physical activity (CDC, 2013a). For example, parents have a significant influence on the foods children eat because they determine which foods are made available for the child. If the parent does not prepare healthy meals and they allow the child to consume large amounts of energy dense foods, they are increasing the child’s risk for obesity (Bishop, Middendorf, Babin, & Tilson, 2005). Even though all of the potential causes of childhood obesity are important, for the purpose of this dissertation, the key influences considered will be parents and the community.

**Role of Parents**

Parents play one of the most important roles in childhood obesity prevention. They highly influence children’s healthy and unhealthy habits by “promoting certain values and attitudes, by rewarding or reinforcing specific behaviors, and by serving as role models” (Institute of Medicine, 2004, para. 1). More specifically, parents are in charge of what foods are provided, the structure of meals, screen time, modeling healthy eating, and participating in physical activity.
(Lindsay, Sussner, Kim, & Gortmaker, 2006). Maintaining a healthy lifestyle for their children can be difficult for parents due to time and money constraints (Institute of Medicine, 2004). They may find they do not have the money or access to purchase healthy food, the funds to purchase a gym membership for their family, the time to prepare meals at home, or the time to engage in physical activity with their children.

**Role of the Community**

The participation of the community is an important aspect of childhood obesity prevention. “To eliminate health disparities and address health problems, communities need to be empowered to develop relevant interventions based on scientifically sound knowledge and synthesis of previous research” (Conway, Haller, & Lutfiyya, 2012, p. 641). The Institute of Medicine (2006) has several recommendations for the involvement of the community. First, it is recommended that communities gather resources required to identify, implement, evaluate, and disseminate effective interventions for childhood obesity prevention. They encourage leaders responsible for these programs to evaluate the efforts in order to provide evidence of a successful program. They also recommend monitoring the progress this intervention has on obesity prevention, and disseminating the results. The Nemours Foundation (2014) agrees that the most effective efforts to achieve childhood obesity prevention occur when leaders in the community collaborate with the other professionals to provide education to families about healthy eating and physical activity.
**Associated Health Problems**

Childhood obesity is associated with many health problems. Children who are obese are more likely than their normal weight peers to have high blood pressure, high cholesterol, impaired glucose tolerance, insulin resistance, type 2 diabetes, sleep apnea, asthma, joint problems, fatty liver disease, gallstones, and gastroesophageal reflux (CDC, 2012). There are also many psychological complications associated with childhood obesity. According to Vander Wal and Mitchell (2011) these can include “low self-esteem, depression, body dissatisfaction, loss-of-control eating, unhealthy and extreme weight control behaviors, impaired social relationships, obesity stigma, and decreased health-related quality of life” (p. 1393). A study of 106 children and adolescents among multiple ethnicities found that obese children rated their health-related quality of life similar to that of a child with cancer (Schwimmer, Burwinkle, & Varni, 2003). As obese children struggle to improve their own self-esteem and body image, they are also faced with the fight to fit in with their peers. Literature indicates that among children ages 10 to 11, overweight children are ranked the lowest with whom these children would like to be friends and are viewed as lazy and sloppy by their peers (Staffieri, 1967, as cited in Dietz, 1998). Overweight children are also victims of bullying. In fact, 24% of 6th grade boys and 30% of 6th grade girls state they experience bullying on a daily basis due to their weight. These numbers are doubled for high school students (Stevelos, 2013).

Furthermore, children who are obese are more likely to be obese as an adult. Approximately 33% of obese preschoolers and 50% obese school-age children will continue to be obese into adulthood (Reilly & Kelly, 2011). This puts them at even higher risk for these health problems such as heart disease, diabetes, and cancer (CDC, 2012); in addition to an increased risk of premature mortality and adult morbidity (Reilly & Kelly).
Cost

Childhood obesity also has an impact on the nation’s medical costs. Annual medical costs are about three times higher for an obese child than a child of normal weight. The average annual costs for prescription drugs, emergency room visits, and outpatient services related to childhood obesity are more than $14 billion and the inpatient hospital costs are $238 million annually (Children’s Defense Fund, 2012). In Michigan, it was estimated that the total cost of obesity in 2008 was $3.1 billion (Michigan Department of Community Health, 2012). In addition to the medical costs there are physical, emotional and social costs related to childhood obesity. Among adults, obesity-related job absenteeism costs the nation $4.3 billion each year. Obesity is also associated with decrease work productivity totaling $506 per obese worker each year (Cawley, 2010). Among children, the loss of productivity is expressed as school absenteeism. Compared to their normal weight peers, school absenteeism among obese children is significantly higher (Geier et al., 2007). If nothing is done to prevent obesity in children, the medical and indirect costs will continue to rise.

Prevention

There are many challenges to treating childhood obesity. Due to their growing and developing bodies, children whose diet is restricted may not receive the energy and nutrients their bodies need to properly develop (Department of Health Information for a Healthy New York, 2012). Additionally, medication and surgery for weight loss can be expensive and potentially harmful for children (Barlow & Expert Committee, 2007). 

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Therefore, interventions aimed towards improving childhood obesity should focus on preventive strategies. This would include lifestyle behaviors such as proper nutrition and physical activity starting as early as infancy (Barlow & Expert Committee; Council on Sports Medicine and Fitness & Council on School Health, 2006).

A child gains weight when the amount of calories consumed exceeds the amount of energy expended (National Heart, Lung, and Blood Institute, 2012). Therefore, to prevent weight gain, a child must maintain a balance between calorie consumption and energy expenditure. Healthy eating is one way to reduce the risk of a child developing obesity. It also helps prevent other diseases such as cardiovascular disease, cancer, and diabetes (CDC, 2013c). It is currently recommended that on a daily basis, children should eat 6-11 servings of grains, 3-5 servings of vegetables, 2-4 servings of fruits, 2-3 servings of dairy and 2-3 servings of protein. Fats, oils, and sweets should be used sparingly (U.S. Department of Health & Human Services, 2008). It has been reported, however, that children are not meeting the recommendations for nutrition. In fact, 40% of the daily calories consumed by children and adolescents aged 2-18 years are empty calories from added sugar and solid fats (CDC, 2013c).

Exercise is also important as it improves many aspects of a child’s life such as; strength and endurance, helps build healthy bones and muscles, helps control weight, increases self-esteem, and reduces the risk for diabetes and cardiovascular disease (CDC, 2013d). It is recommended by the U.S. Department of Health and Human Services (2008) that children 6-17 years old participate in a minimum of 60 minutes of physical activity daily. However, the CDC (2013d) reported that as young children age, the amount of physical activity they participate in declines.
Focus of the Project

The American Dietetic Association (ADA, 2006) conducted a systematic review to uncover evidence of the best intervention for pediatric overweight prevention. Through their research it was determined that the best preventative plan is one that incorporates a multicomponent, family-based program that takes place in a community setting. This recommendation is also supported by other experts (National Institutes of Health, 2008; Pratt, Stevens, & Daniels, 2008). The program should include behavioral counseling, promotion of physical activity, and nutrition education (ADA, 2006). Conway et al. (2012) state that the design of an intervention for a rural community, should include input from children, parents, and relevant health care providers in the community.

B. Healthy Families was developed by the doctor of nursing practice (DNP) student and community health partners as an effort to promote healthy behaviors among families in a west Michigan rural community with a population of approximately 59,097 people. Children and adolescents under the age of 18 make up 21% of the population. From 2009-2013 about 8.3% of families were below the poverty level. A majority of residents are Caucasian (94.9%), followed by Hispanic or Latino ethnicity (2.5%). A very small percentage of this population includes African American, American Indian, and Asian races (United States Census Bureau, 2014).

B. Healthy Families is a community-based program that involves the entire family. Children ages 5-16 were referred to this program by their primary care provider based on the provider’s evaluation that the child and family were in need of education on healthy behaviors. Meetings were held on Monday nights for six weeks, with each session lasting two hours. During these sessions, families learned about nutrition, physical activity, and behavior modification. In addition, they participated in physical activity. This program took place at the local YMCA.
The purpose of this dissertation project was to help facilitate the B. Healthy Families program and determine its feasibility and effectiveness at improving healthy behaviors, increasing knowledge about nutrition and physical activity, and increasing adherence to 5-2-1-0. The last outcome, the 5-2-1-0 initiative is a way to encourage families to eat healthy and participate in physical activity. It specifically encourages families to eat five servings of fruits and vegetables, engage in two hours or less of screen time, participate in at least one hour of physical activity, and drink zero sugary drinks each day (Let’s Go, 2012a). Results from this project will be used to refine and improve the B. Healthy Families program so it can be a continuous and successful program offered to families in the targeted county.
CHAPTER 2
LITERATURE REVIEW

The purpose of this review is to synthesize literature to uncover the evidence for qualities of effective approaches to childhood obesity prevention. The review is divided into three sections including: importance of childhood obesity prevention, role of parents in childhood obesity, and effectiveness of current community- and family-based multicomponent prevention programs. A search of the literature was conducted using CINAHL, PubMed, and PsycInfo databases. The searches were conducted using various combinations of the following keywords: childhood obesity, prevention, health consequences, role of parents, multicomponent, community-based, and prevention programs. Abstracts were excluded if they were more than 10 years old, were non research, focused on causes and treatment rather than prevention of childhood obesity, and were not in English.

Levels of Evidence

When reviewing research, it is important to take into consideration the strength of the evidence. This can be done by using an evidence hierarchy which is “a ranked arrangement of the validity and dependability of evidence based on the rigor of the method that produced it” (Polit & Beck, 2012, p. 727). According to this hierarchy, there are seven levels of evidence. A research study ranked at a Level I contains the strongest possible evidence and Level VII is the weakest evidence. The levels are broken down by research design as follows:

- Level I: systematic reviews of randomized controlled trials and systematic reviews of nonrandomized trials
- Level II: single randomized control trial and single nonrandomized trial
- Level III: systematic review of correlational/observational studies
- Level IV: single correlational/observational study
- Level V: systematic review of descriptive/qualitative/physiologic studies
- Level VI: single descriptive/qualitative/physiologic study
- Level VII: opinions of authorities, expert committees


These levels will be used to look at the strength of the articles in this review.

Results

Prevention of Childhood Obesity

The prevention of childhood obesity is critical in order to protect children from the many consequences associated with obesity. The need for prevention is well documented in the literature. A search of the databases as described above resulted in twelve research studies that depicted the physical and psychosocial effects obesity has on the well-being of children. According to the findings of these studies, children who are obese are at greater risk for metabolic syndrome (de Silva, Wickramasinghe, & Gooneratne, 2006; Saha, Sarkar, & Chatterjee, 2011; Weiss et al., 2004), hypertension (Movahed, Bates, Strootman, & Sattur, 2011), decreased lung function (Spathopoulos et al., 2009), musculoskeletal problems (Krul, van der Wouden, Schellevis, van Suijlekom-Smit, & Koes, 2009), premature mortality (Reilly & Kelly, 2010), decreased school attendance (Geier et al., 2007), bullying (Griffiths & Page, 2008), depression (Zeller & Modi, 2006), decreased peer acceptance (Zeller, Reiter-Purtill, & Ramey, 2008), and low self-esteem (Franklin, Denyer, Steinbeck, Caterson, & Hill, 2006). An exploration of these health and psychosocial consequences helped to explain the importance of childhood obesity prevention.
Of the twelve research studies evaluated, three of the studies investigated the relationship between metabolic syndrome and obesity in children and adolescents. The 2006 study by de Silva et al., examined the association between obesity and metabolic syndrome and non-alcoholic steatohepatitis (NASH). The purpose of the study was to document this association in obese Sri Lankan children recruited from the Obesity Clinic of the Lady Ridgeway Hospital. The study involved 40 boys and 30 girls with an average age of 9.7 years and 9.3 years respectively. All 70 children were considered obese which was determined by a BMI >95th percentile. Participants were determined to have metabolic syndrome if their waist circumference was >98th percentile and if they met two of the following criteria: serum triglyceride >95th percentile, high density lipoprotein (HDL) cholesterol <5th percentile for age and gender, hypertension, and abnormal glucose homeostasis. Children underwent a liver ultrasound to assist in the determination of NASH. The children were determined to have NASH if the ultrasound showed evidence of fatty infiltration of the liver and their alanine transaminase (ALT) was elevated. Of the 70 participants, metabolic syndrome criteria were fully assessed in 63 children. Of these children, 13 (21%) were determined to have metabolic syndrome. A total of 60 children had both their ALT and ultrasound assessed and 11 (18%) had evidence of NASH. Results of the study showed that the obese children in this study had a significant incidence of metabolic syndrome and NASH. However, a major limitation was that there was not a comparison group to determine if normal weight Sri Lankan children also exhibited signs of the two health problems. The studies conducted by Saha et al. (2011) and Weiss et al. (2004) both included a control group with normal weight children.
Saha et al. (2011) studied the prevalence of metabolic syndrome in addition to the cardiovascular and endocrine effects of childhood obesity. The study involved a study group of 49 overweight and obese children (BMI greater than the 85th percentile and 95th percentile respectively) between the ages of 6 and 11 years and a control group of 45 normal weight children (BMI less than the 85th percentile and greater than the 5th percentile) in the same age range. The overweight and obese children were recruited from a pediatric weight management clinic in the city of Kolkata. The control group consisted of children from the same community. Metabolic syndrome was defined as having three or more of the following: fasting serum triglyceride (TG) $\geq$ 100 milligrams (mg)/deciliter (dl), serum HDL $\leq$ 50 mg/dl, fasting blood glucose $\geq$ 100 mg/dl, systolic blood pressure (BP) $>$ 90th percentile for age, gender, and height, and waist circumference $>$ 75th percentile for age and gender. Results indicated that none of the children in the control group had metabolic syndrome compared to 14.3% of the obese children. The percent of obese children who had at least one risk factor was 89.8% compared to 68.9% in the control group. Obese children in this study were also significantly more likely than those in the control group to have insulin resistance and hyperlipidemia. This study is limited by the fact that the group of obese children was selected by their attendance at the pediatric weight management clinic. According to the authors, children who attend this clinic do not necessarily represent all obese children in the community. The children at the clinic are often described as having disfiguring obesity. Similar results were found in the 2004 study by Weiss et al.

Weiss et al. (2004) conducted a study of 439 obese children and adolescents. Their goal was to examine the prevalence of metabolic syndrome among these children. They defined obesity based on a threshold BMI z score of 2.0 or more adjusted for age and sex.
The researchers described the subjects as moderately obese (z score of 2.0 to 2.5) or severely
obese (z score >2.5). Also included in this study as a comparison group were siblings of the
obese children, which included 20 children with a BMI <85th percentile and 31 overweight
children with a BMI between the 85th and 97th percentiles. Metabolic syndrome was determined
if the children met 3 or more of the following: BMI >97th percentile, TG level >95th percentile,
HDL cholesterol level <5th percentile, systolic or diastolic BP above the 95th percentile, and
impaired glucose tolerance. Results indicated that none of the normal weight or overweight
participants had metabolic syndrome compared to 38.7 percent of moderately obese subjects and
49.7 percent severely obese subjects. A strength to this study was the participants in the
comparison group were siblings of the test group. This is beneficial because it helps eliminate
possible differences in parenting between the two groups. To summarize, the three studies
discussed all support the notion that childhood obesity is associated with metabolic syndrome.
This is of great concern because metabolic syndrome raises a person’s risk for heart disease,
diabetes, and strokes (National Institutes of Health, 2011). Two of the studies also found obese
children to have high blood pressure (de Silva et al., 2006; Saha et al., 2011). The correlation of
high BP and obesity was also examined in a study involving adolescent subjects (Movahed et al.,
2011).

Movahed et al. (2011) examined the relationship between obesity and high blood
pressure as well as obesity and left ventricular hypertrophy (LVH). This was a retrospective
study using data from a public health screening event in Arizona. Subjects were screened for
LVH by experienced cardiologists using a handheld echocardiogram. They were determined to
have LVH if the left ventricle (LV) wall thickness was > 11 millimeters. Hypertension was
defined as a systolic BP > 140 millimeters of mercury (mmHg) or diastolic BP >90 mmHg.
Obesity was defined as a BMI >30. BMI and LV wall thickness were documented in 1,778 subjects. LVH was present in 28.3% of 166 obese subjects and in 6.1% of 1612 non obese subjects. The researchers performed a multivariate adjustment for age, gender and blood pressure, and obesity was still significantly associated with LVH (P<0.001). Obesity was also associated with high BP. A total of 1495 subjects were screened for BMI and BP. A high systolic BP was present in 38% of 142 obese subjects and 12.7% of 1353 non obese subjects. Diastolic BP was elevated in 10.6% of 141 obese subjects and 3.1% of 1352 non obese subjects. Again, the researchers performed a multivariate adjustment for age, gender, and LVH and obesity was still highly associated with high systolic and diastolic BP (P<0.001 and P=0.03 respectively). This is of great significance, because a high blood pressure can lead to a stroke, heart attack, congestive heart failure, kidney damage, impaired vision, and hardening of the arteries (National Heart, Lung, and Blood Institute, n.d.). Overall, this study was well designed. There was a large population sample and a comparison group which leads to more convincing results.

Spathopoulos et al. (2009) focused their study on the effect of obesity on pulmonary lung function in school age children. They also sought to find a connection between atopy and asthma with obesity. The study population consisted of 6-11 year old children recruited from a school in Greece. A total of 2,715 children participated in the study and consisted of children in three categories: children with a BMI between the 3rd and 85th percentile for age and sex (n=1,978), a BMI between the 85th and 95th percentile (n=403), and a BMI greater than the 95th percentile (n=334). Children were excluded from the study if they had a respiratory infection, a recent asthma exacerbation, or uncontrolled asthma. To assess lung function, an investigator who was blinded to the subjects assisted them in performing spirometry.
The results revealed that BMI had a statistically significant effect on the percent expected and z-scores of the forced vital capacity (FVC) ($P=0.007$), the forced expiratory volume in 1 second (FEV$_1$) ($P<0.001$), the FEV$_1$/FVC ratio ($P<0.001$), and the forced expiratory flow at 25-75% ($P<0.001$). In addition to the decreased pulmonary lung function, the researchers also found an association between asthma and atopy with obesity. The diagnosis of asthma and atopy were self-reported. It was determined that overweight and obese children were more likely to have an asthma diagnosis ($P=0.036$) and higher reports of atopy ($P=0.008$) compared to normal weight children. Conclusions of this study were that obesity puts the child at greater risk for poor pulmonary lung function, asthma, and atopy.

The final study to focus on physical consequences of obesity in children was a health interview conducted by Krul et al. (2009). Participants included 100 obese children, 219 overweight children, and 2,140 normal weight children ages 2 to 17 years old. This study was conducted in the Netherlands and included Dutch natives. The researchers collected self-reported height, weight, and musculoskeletal problems. Results of these self-reports indicated that overweight and obese children had more musculoskeletal problems than normal weight children including pain in the neck, back, arms, legs, hips, knees, ankles, and feet. Some major limitations in this study were noted. First the height and weight of the children were self-reported and not measured by the researchers. This could have led to imprecise data and misclassification of the children as normal weight, overweight and obese. Ultimately, this would lead to inaccurate results. Another limitation was overweight and obese children were grouped together. This does not allow for a true understanding of the effects overweight and obesity individually have on the musculoskeletal system.
In addition to the problems obesity can lead to in the childhood years, it also has long-term complications that impact adulthood. Reilly and Kelly (2010) conducted a systematic review to determine if there was an association between obesity in childhood and adolescence and early morbidity and mortality in adulthood. Through their review they determined individuals who were obese as a child have an increased risk of premature mortality, diabetes, stroke, coronary heart disease, hypertension, asthma, and polycystic ovary syndrome in adulthood.

Childhood obesity is associated with many emotional problems. Zeller et al. (2008) examined peer perceptions of obese children in the classroom environment. Their study involved 90 obese (BMI ≥ 95th percentile) children ages 8-16 years who were recruited from a pediatric weight management clinic. The study took place in the classrooms of these children. A total of 1,613 peers in these classrooms as well as the teachers also participated in the study. Study participants filled out questionnaires that asked the children to rate how much they like each of their classmates, to list three best friends, and to cast students into roles of an imaginary play. These roles included the following behaviors: popular-leader, prosocial, aggressive-disruptive, sensitive-isolated, good looking, not good looking, good at sports, not good at sports, always knows the answers in class, has trouble with school work, someone who is sick a lot, someone who misses school a lot, and a person who is tired a lot. The results indicated that peers characterized obese children as: nominated less often as a best friend, less popular-leader, more aggressive-disruptive, more sensitive-isolated, and less liked. The results of this study gave good insight as to how obese children are viewed by their peers. This information is helpful because it is the lack of peer acceptance that can lead to some of the psychological problems associated with obesity such as depression (Puhl & Latner, 2007). The report by Griffiths and Page (2008),
a qualitative study of 12 obese female adolescents, supported this notion. One of the authors conducted interviews in the homes of the participants. Multiple interviews were conducted to develop a rapport with the participants. The technique used for this study was interpretative phenomenological analysis. They found that all participants were current or past victims of bullying from peers. Children reported being physically and verbally bullied by peers, which led to low self-confidence and depression. There were two significant limitations to this study; it included only females and did not have a comparison group of normal weight adolescents.

Depressive symptoms among obese children were also found by Zeller and Modi (2006). The aim of their study was to determine the health-related quality of life (HRQOL), depressive symptoms, and perceived social support among obese children and adolescents. Their sample included 166 children ages 8 to 18 with a BMI $\geq 95^{th}$ percentile. They used three questionnaires to collect their data: the Children’s Depression Inventory (CDI), the Pediatric Quality of Life Inventory (PedsQL), and the Perceived Social Support Scale for Children (SSSC). When using the criteria recommended for clinical settings for the CDI, the study revealed that 34% of the sample exhibited significant depressive symptoms. When compared to published data of normal weight children, the obese children in this study had a lower HRQOL. Last, it was determined that these children receive more social support from their parents and friends compared to classmates and teachers.

Like Griffiths and Page (2008), Franklin et al. (2006) also found a correlation between obesity and low self-esteem. They studied 2,749 Australian children ages 9.2-13.7 years. The participants were classified into four groups based on weight for height; underweight ($\leq 5^{th}$ percentile), normal weight ($>5^{th}$ percentile and $<85^{th}$ percentile), overweight ($\geq 85^{th}$ percentile and $<95^{th}$ percentile) and obese ($\geq 95^{th}$ percentile). During the study, participants were asked to
fill out a self-perception questionnaire and a body shape perception questionnaire. Obese boys and girls in the study scored significantly lower than normal weight participants on athletic competence, physical appearance, and global self-worth and wished to have a thinner body shape. Obese girls also scored lower on social acceptance. This study revealed the impact obesity has on the self-esteem of children. In addition to the physical and emotional impact, childhood obesity also affects school attendance. Two strengths to this study were the large sample size and the inclusion of children from all weight statuses. The study was limited by the narrow age range.

Geier et al. (2007) studied fourth to sixth graders in Philadelphia schools to determine the association between weight and school attendance. Children were classified into the same four groups as the children in Franklin et al. (2006). Of the 1069 participants, 245 were considered obese. The study lasted two school semesters. Each semester, a weight was recorded for the children and attendance was taken for the entire study period. The researchers used one-way ANOVA to identify difference in the mean. Results of the study indicated that obese children were absent significantly more than normal weight children (p <0.05). This lack of school attendance could potentially affect the child’s academic success. The large sample size and inclusion of a comparison group were the strengths to this study. Two limitations of this study were it only included children in fourth through sixth grade, and it only followed their attendance for one school year. A longer study and inclusion of a wider age range would have provided more generalizable results.
From the review of this literature, it is evident that there are many health consequences associated with childhood obesity both physiologically and psychologically. With most of the studies being correlational studies, it cannot be determined that obesity caused the health conditions, rather there is a correlation between the two conditions. While these studies were well designed, they were not without limitations. In regards to level of evidence, one of the studies was a level II, one a level III, eight were a level IV, and two were a level VI. Overall, this evidence supports the need for the prevention of childhood obesity. If this condition is not prevented, children may be more at risk for the associated conditions including: metabolic syndrome, hypertension, decreased lung function, musculoskeletal problems, premature mortality, decreased school attendance, decreased peer acceptance, and low self-esteem.

**Role of the Parents**

It is supported in the literature that parents have a large role in the development of obesity in children. This role is well described by Lindsay et al. (2006):

Parents shape their children’s dietary practices, physical activity, sedentary behaviors, and ultimately their weight status in many ways. Parent’s knowledge of nutrition; their influence over food selection, meal structure, and home eating patterns; their modeling of healthful eating practices; their levels of physical activity; and their modeling of sedentary habits including television viewing are all influential in their children’s development of lifelong habits that contribute to normal weight or to overweight and obesity. (p. 170)

A search of the literature revealed many research studies supporting the parental influence on nutrition in children. However, very few studies looked at the role the parents have on physical activity.
The main categories identified in this search were parental employment, parenting style, family structure, family stressors, family mealtimes, and role modeling. A total of 19 studies met the criteria and will be further reviewed.

**Parental employment.** Most of the research regarding the relationship between parental employment and childhood obesity focused on the role of the mother. The literature stated that children of working mothers are more likely to be overweight or obese (Benson & Mokhtari, 2011; Brown, Broom, Nicholson, & Bittman, 2010; Ziol-Guest, Dunifon, & Kalil, 2013). This is related to factors such as the children having greater access to energy-dense foods, mothers having less time to prepare meals, and mothers not eating meals with their children (Brown et al., 2010).

The relationship between maternal employment and weight status was studied by Brown et al. (2010). They used data from the Longitudinal Study of Australian Children. Data were taken from a cohort of children at age 4-5 years (n=4,983) and again at age 6-7 years (n=4,464). It was determined that longer maternal work hours was directly correlated with an increased likelihood of the child being overweight.

Ziol-Guest et al. (2013) also examined this relationship in 4,192 children; however, they included the mother’s partner. They used data from the U.S. National Longitudinal Survey of Youth 1979 and Children of the National Longitudinal Survey of Youth. They selected children who had been followed for 13-14 years. Employment history of the mothers and their partners were taken from work history files. The researchers sought to determine how over time a mother’s and her partner’s employment status affected the BMI of the children. It was determined that an increased number of mother work hours over the child’s lifetime was associated with an increased BMI and risk of overweight and obesity by age 13-14.
They found in their study that this could be related in part to television viewing. In relation to the partner or spouse, there was no association between work hours and the child’s BMI. Benson and Mokhtari (2011) found similar results regarding the mother, but determined that the father working is more influential. They used a sample of 1,099 children from the Child Development Supplement 2007-2008 with an average age of 14.5 years. The results indicate that when both parents are working, there is an increase in the child’s BMI, however, the father working is more influential. They speculate that this could be due to the disproportionately fewer hours the father spends on child-rearing.

The last study retrieved in the literature search to examine the relationship between parental employment and weight status was conducted by Morrissey (2013). Data for this study were retrieved from the U.S. National Institute of Child Health and Human Department’s Study of Early Child Care and Youth Development. The data was examined to determine if there was an association between both paternal and maternal employment and children’s BMI. A total of 1,107 children ages 2 to 15 years were included in the study. Children were evaluated during three time periods; preschool (24-60 months), school-age (kindergarten-6th grade) and adolescence (7th grade-15 years). It was determined that each time period that a mother was employed was associated with a 2.29% increase in the child’s BMI percentile. The study also revealed that children in dual-earner families have a greater increase in BMI compared to those children in a single-earner home. Each time period that both parents were employed was associated with a 3.02% increase in the child’s BMI percentile. It is stated that this could be due to the challenges of preparing healthy meals that are faced by working parents such as time constraints.
Bauer, Hearst, Escoto, Berge, and Neumark-Sztainer (2012) took a different approach to their study. Rather than looking at the impact of parental employment on BMI, they examined its relationship to family meals, food preparation, encouragement of healthy eating, and fast food intake. Similar to the other studies, they drew their data from a previous survey. They had a large sample size of 3,256 adolescents. Through their analysis of these data, they determined that mothers who worked full-time were more likely to purchase fast food for family meals, spend less time preparing food for the family, and provide less encouragement for their child to eat healthy. This was not observed in the fathers. The only difference between fathers who worked full-time and those who were part-time or unemployed was the fathers working full-time spent less time preparing food throughout the week. Parents who have a high work-life stress were also more likely to provide their family with fast food and have less frequent family meals. Anderson (2012) had similar findings in her study. She determined that mothers’ increased work hours are associated with a decrease in family meals, meals at regular times, and rules about television. Interestingly, as the mother’s work hours increased, so did the child’s participation in aerobic exercise. Anderson stated this relationship could be due to the use of organized sports by working mothers.

To summarize these data, children whose parents work full-time are at greater risk for overweight and obesity. As the literature indicated, this is due to an increase in fast food consumption, less family meals, less encouragement from parents to eat healthy, fewer rules about inactivity, and less food preparation by the parents. This indicates that working parents need education on how to incorporate healthy home cooked family meals into their busy schedules and how to limit their child’s screen time.
Parenting style. The way parents interact with their children or how they parent has a role in the occurrence of behaviors that put children at risk for obesity. Parental encouragement, support, involvement, and modeling of activity have a positive effect on activity in children (Ritchie, Welk, Styne, Gerstein, & Crawford, 2005). Lau, Lee, & Ransdell (2007) investigated parenting style influence on overweight children’s attraction to physical activity. This study took place in Hong Kong and involved 104 families of overweight children ages 8 to 12 years old. Data collection took place via questionnaires that were sent home with the children from school. Overall findings from this study are that physical activity role modeling, encouragement, and physical activity enjoyment by parents was significantly and positively related to children’s attraction to physical activity. However, after separate analyses were done to separate boys and girls, it was determined that these findings were only positively significant for boys and there was no correlation found in the girls. There are several limitations to this study including the small sample size, the lack of normal weight participants, and the difference in parenting styles between China and the United States.

In regards to nutrition, parents who put too much control on what their child can and cannot eat or fail to offer healthy options negatively influence their child’s dietary intake. It is also proposed that using food as a reward increases the child’s preference for that food and making a child finish a food on their plate decreases the child’s preferences for the encouraged food (Ritchie et al., 2005). Restricting foods also causes an increased preference for this food. Rollins, Loken, Savage, & Birch (2014) determined that after a liked food was restricted for a period of time and then reintroduced, children ages 3-5 had a 60.5% increased intake of this food.
The restriction also increased their requests and attempts to access this food immediately after it becomes restricted. This suggests that parents who put too much restriction on unhealthy foods may be causing poor eating habits in their children that can lead to overweight and obesity.

Mazzeschi et al. (2014) studied the role of parental attachment pattern in childhood obesity. This study took place in Italy and involved mothers and fathers of 44 children ages 6 to 15 years. These children were recruited from the center for overweight/obesity. Anthropometric measures were taken and the parents filled out several different questionnaires regarding anxiety, depression, and attachment. The data suggest that children whose mothers and fathers had a secure attachment pattern had lower BMIs than children whose mothers and fathers had a dismissing, preoccupied, or unresolved attachment pattern. The small sample size should be noted as a limitation of this study. Another major limitation was the lack of a comparison group. All participating children were classified as being overweight or obese so it is unknown if the results are only true of these children or all children regardless of their weight status.

Two of the reviewed studies looked at specific parenting styles and their relationship to dietary behavior in children. There were four parenting styles described. The first was authoritative. These parents have reasonable expectations for their child; they encourage autonomy, respect their child’s thoughts and opinions, and provide warmth. Authoritarian parents are insensitive and place strict demands on their child. Like authoritative parents, permissive parents provide warmth and respect to their child; however, they do not have expectations for their child. Last, neglectful parents are unaware of their child’s needs or opinions and have no demands (Vollmer & Mobley, 2013).
Literature reviews were conducted by Vollmer and Mobley (2013) and Sleddens, Gerards, Thijs, DeVries, & Kremers (2011) to determine the effects of the above parenting styles on child obesity risk behaviors. The findings were highly variable across the studies. In general, it was determined that the authoritative parenting style was more likely to produce increased consumption of fruits and/or vegetables (Sleddens et al.; Vollmer & Mobley), more frequent breakfast consumption (Vollmer & Mobley), decreased high fat and/or sugar intake, more frequent family meals, and less fast food consumption (Sleddens et al.). Authoritarian parenting style is positively associated with home availability of sweet drinks and candy, higher child body weight, sedentary leisure time activities, and poor nutrition. This parenting style is also negatively associated with child high fat and/or sugar intake (Sleddens et al.). Children of permissive parents are more likely to have an increased BMI (Sleddens et al.) and daughters of permissive fathers have higher intakes of fruits and vegetables compared to authoritarian fathers (Vollmer & Mobley). Last, children who have neglectful parents are more likely to participate in frequent snacking (Vollmer & Mobley), have decreased consumption of fruits and/or vegetables, higher weight, and sedentary leisure activities (Sleddens et al.). Both of the literature reviews revealed that parenting style is not a strong indicator for physical activity in the child (Sleddens et al.; Vollmer & Mobley).

Xu, Ming Wen, Rissel, Flood, and Baur (2013) looked at the effect parental self-efficacy, parental warmth, and parental hostility have on dietary behavior of young children. Data were extracted from the Healthy Beginnings Trial and a cross-sectional data analysis was completed. The study involved 337 first-time mothers in Sydney, Australia. Face-to-face interviews were done to collect demographic data and assess self-efficacy, parenting style, and children’s dietary behaviors.
Findings of this study indicate that children whose mother has a high self-efficacy, high level of parental warmth, and low level hostility are more likely to have two servings of vegetables and fruit per day and consume less soft drinks. A major limitation of this study was the lack of involvement of fathers.

**Family structure.** As shown from the above literature review, parenting styles have an effect on the health behaviors of children. Family structure also plays a role. The family structures revealed in this literature search focused on single parent homes. Chen and Escarce (2010) conducted a study of 17,565 children in kindergarten third grade, and fifth grade. Data were used from the Early Childhood Longitudinal Study. They found that the number of parents in the household was not associated with BMI or risk of obesity for kindergartners or third graders; however, fifth grade children from single-mother families were more likely than their peers living in a family with two parents to be obese. Data from children in all grades also indicated that those without siblings have a higher BMI. One limitation to this study is they did not evaluate single-father families. The biggest limitation to the study was they defined single-mother families as “families in which the child’s mother was living with the child but the father was absent” (p. 3). This definition does not account for families in which the mother is cohabitating. If a mother is cohabitating her partner could certainly have an effect on the parenting of the child, therefore, affecting the study results. In relation to family structure, the biggest influence discovered in the 2012 study by Schmeer was that children whose mothers separated from her partner or was single when the child was between the ages of three and five had a higher gain in BMI than children with stable married mothers. As long as the mother was in a stable relationship during this time, the type of union did not influence the child’s BMI.
**Family stressors.** Just as a family with an unstable structure can contribute to overweight and obesity in children, parental and family stressors have a similar effect. Garasky, Stewart, Gundersen, Lohman, & Eisenmann (2009) studied two samples. The first comprised of children between the ages of 5 years and less than 12 years and the second children ages 12 years to less than 18 years. The total sample size was 2,137. They examined the effects of six categories of stressors on child weight status. The categories included family disruption and conflict, mental and physical health problems, housing issues, health care struggles, financial strain, and lack of cognitive stimulation and emotional support. Data was collected through questionnaires. In the younger children, being overweight and obese was positively correlated with lack of cognitive stimulation and emotional support. In the older children, overweight and obese was positively related to higher levels of mental and physical health problems and financial strain. Shankardass et al. (2013) also found a positive correlation between parental stress and increased weight gain in pre-adolescents. In order to reduce this association, prevention programs could incorporate stress management techniques. If parents are better able to handle their stress, their children will have a lesser chance of becoming overweight.

**Family mealtimes.** Family mealtimes promote healthy eating among children and adolescents. Children who eat dinner with their family have an increased consumption of fruits, vegetables, and whole grains and a decreased consumption of fats and soft drinks (Lindsay et al., 2006). Anderson’s (2012) previously described study revealed that an increase in family dinners led to an increase in exercise, decreased television watching, and decreased fast food consumption.
Gable, Chang, and Krull (2007) studied 8,459 children. Data were obtained at four points which included kindergarten fall and spring, first grade spring, and third-grade spring. Information about the family was obtained via telephone interviews with the parents. The child’s height and weight were also collected. It can be concluded that children who ate fewer family meals in kindergarten and first grade were more likely to be overweight at third grade spring.

Fiese, Hammons, and Grigsby-Toussaint (2012) looked at the quality of family meal times. They video-taped 200 family mealtimes and coded them using the ABC Mealtime Coding System. They observed that families of children who were considered a healthy weight spent more time gathered together during the meal and engaged in more positive communication than families whose children are overweight or obese.

**Role modeling.** Parental behaviors have a significant impact on children. Natale et al. (2014) performed a randomized control study to determine if children in the obesity prevention intervention would have better nutritional intake and physical activity patterns compared to the control group. The study involved 28 day care centers that were randomly assigned to either the intervention or control group. The intervention focused on parents and teachers role modeling a healthy lifestyle. This included a drink policy, snack policy, physical activity policy, and a screen time policy. These policies were focused on improving healthy behaviors. A total of 1,211 children, 1,080 parents, and 122 teachers participated. Parent consumption of fruits and vegetables corresponded to an increased child consumption of fruits and vegetables. Parents of the intervention group influenced their children to decrease the consumption of junk food whereas parents in the control group influenced their children to consume more junk food. The parents had no significant influence on sedentary behaviors.
All of the studies reviewed in this section are correlational studies, which is level III evidence. It can be determined from this review that there is correlation between childhood obesity and parental employment, parenting style, family structure, family stressors, family mealtimes, and parental role modeling. This evidence supports the need to incorporate parents in childhood obesity programs.

**Community- and Family-Based Multicomponent Prevention Programs**

As discussed in chapter 1, experts recommend prevention programs that are community- and family-based and incorporate behavioral counseling, promotion of physical activity, and nutrition education. An extensive search of the literature was conducted to determine if any research has been published that incorporated all of these elements into a prevention program. The intention was to find this research and determine the outcomes, strengths, and limitations of these studies in order to guide the current project. After searching several databases including CINAHL, PubMed, and PsycInfo and searching through large literature reviews (ADA, 2006; Wang et al., 2013; Waters et al., 2011) it was determined there is minimal published research. Five articles met the criteria and are included in this review. Of these five studies, only one study included children with a BMI less than the 85th percentile (Chomitz et al., 2010). The other four studies were still included because the focus was either on the promotion of healthy behaviors rather than treatment or both treatment and prevention.

Wright, Norris, Giger, and Suro (2012) conducted a six week program focused on physical activity, behaviors, and nutrition. Their program involved weekly 90 minute education sessions. Topics covered included healthy lifestyle behaviors, the food pyramid, fats, sugars, salt, healthy alternatives, and cooking patterns. Children were recruited from schools in the Los Angeles Unified School District. A total of five schools participated and were randomized to
either the intervention (n= 2 schools) or control group (n= 3 schools). Recruitment of the children took place via presentations to parents and children, fliers on the school campus, and a letter sent home to the parents. In order to participate, children had to have a BMI greater than the 85th percentile, be English or Spanish speaking, were ages 8 to 12 years old, and had no physical limitations that prevented them from participating in physical activity. A total of 121 children were recruited for the intervention group, and 130 for the control group. Sessions took place at the schools; however, it was in an after school setting. The community was involved by promoting school wellness policies and offering community-level activities. Data was obtained via questionnaires and was collected at baseline, completion of the intervention, and at 12 months post intervention. The intervention group showed a significant decrease in BMI between baseline and the 12 month follow-up. There was also a significant increase in dietary intake of vegetables, fruit, and 100% fruit juice from baseline to the 12 month follow-up in the intervention group. Also, by the 12 month follow-up the children in the intervention group were better able to identify which foods were better for their health than the children in the control group.

This study only included children who were overweight or obese and cannot be considered an obesity prevention program. However, the focus was on promoting healthy behaviors, not the treatment of obesity, therefore, it was included in this review. One limitation to this study is although they incorporated lessons about physical activity and the children participated in physical activities at each session, this was not measured. Measuring the amount of physical activity pre- and post-intervention would have strengthened this study. Another limitation is the data for all children were grouped together. It would have been beneficial to see the data separated for those children considered overweight from those who were obese.
Doing this would give better insight as to whether this program is effective at improving healthy behaviors in both overweight children and obese children. Overall, it was a well-designed study that incorporated all of the recommended components.

Joosse, Stearns, Anderson, Hartlaub, and Euclide (2008) formed a similar study. They included overweight and obese children to determine if their program was effective at the prevention of obesity in the overweight children and treating obesity in the obese children. Their objectives were to increase physical activity, decrease sedentary behaviors, improve-self-esteem, and increase knowledge of healthy behaviors. During the 12 week program, participants met weekly for two hours. The meetings took place either at the local school or at a YMCA. The sessions involved lessons about nutrition, exercise, and behavior. Most sessions focused on the entire family, however, the children and parents broke into separate groups at times. Each week the children participated in 30 minutes of physical activity and helped prepare a healthy snack. Results of the study indicated that of 68 children and their families, 96% of the parents and 81% of the children showed improved knowledge and attitudes about healthy lifestyles. Based on children’s activity logs, 59% increased their physical activity and 32% reduced their sedentary activities. Two limitations of this study are the small sample size and the lack of a follow-up to determine if these behaviors continued as time went on.

A similar study was conducted by Weaver, Kelley, Griggs, Weems, and Meyer (2014) in regards to the location in a community setting, family involvement, and educational lessons. A total of 10 adults and 17 children participated. Nine of these children were obese, but had nonobese siblings who also participated (n=8). This program involved eight monthly sessions.
After the program, both children and parents were found to have improved diets, increased time spent participating in physical activity, and a significant positive change in their mental health status. This study is limited by the small sample size, lack of long-term follow-up, and the time gaps between classes. The lack of consistent contact with the families does not allow for reinforcement of the positive behaviors.

The final study in this review that did not include normal weight children was conducted by Schwartz et al. (2012). This study took place at YMCAs throughout North Carolina. Children ages 6-11 with a BMI greater than the 85th percentile were recruited from various community entities. A total of 59 children and their families participated in this study. Three times per week for three months, children engaged in an hour of physical activity at the YMCA. These sessions were based on having fun. Once a week, parents were encouraged to join in for a family night. After three months, the children sessions were decreased to once weekly. The program ended after six months. Parents engaged in 10 weekly sessions focused on nutrition. These sessions lasted one hour. Children did not participate in the nutrition sessions. There were no lessons focused specifically on behavior, however, the nutrition lessons incorporated topics such as limiting screen time, making healthy decisions, and increasing physical activity behaviors. Data were obtained at three, six, and twelve months. At three months, participants showed a significant decrease in BMI, television viewing, and fast food intake. However, these findings were not consistent throughout the study period. At the end of the twelve months, the number of fruit drinks and sodas consumed per day significantly decreased, and the amount of physical activity and servings of fruit per day significantly increased. There were several limitations to this study. First, the behavioral component of this program was very minimal. The researchers claimed this was a prevention and treatment pilot-study, however, only eight children were
considered overweight, not obese. In addition, like the other studies, all of the final data were combined. Therefore, there is no way to determine the true effectiveness of this program as a preventative measure. There was also a 29% dropout rate. Last, this is advertised as a family program, but children and parents were separated during the lessons.

The final study in this review was the only study to truly examine the program’s effect on prevention. Chomitz et al. (2010) evaluated the impact of a three year intervention on BMI and fitness among children in kindergarten to fifth grade at baseline. This study was threefold. First, communities were involved through the implementation of policies to support healthy living. Schools participated by creating food service policies and improving access to physical activity opportunities. Last, families were involved by attending family nights. A total of 1,858 children were a part of this study. Based on BMI measures, children were determined to be underweight, healthy weight, overweight, or obese. At the end of the three years, the prevalence of healthy weight increased significantly and the prevalence of obesity decreased significantly. Forty percent of overweight children became a healthy weight and 24 percent of obese children became overweight. Fitness test scores for all children significantly improved from baseline to follow-up. A major limitation to this study was the minimal family involvement. However, the program showed to be effective in preventing and treating obesity in the participants.

It can be determined from this literature search and the review of these five studies that there is a lack of studies that include a prevention intervention that is community- and family-based, and includes lessons on physical activity, nutrition, and behavioral modification. This lack of evidence supports this dissertation project. All five studies are level III evidence.
There are several lessons that can be taken from these studies in order to improve this project and fill a gap in knowledge. First, if recruited children fall into different weight categories it will be important to differentiate their results in order to understand the true impact the project has on prevention versus treatment. Some of these studies lacked a strong family component, therefore, to address this gap in knowledge it would be beneficial for the current project to focus on the family as a unit. Last, it is important to measure all three educational components of the program: nutrition, physical activity, and behavior modification, to strengthen the credibility of the outcome data.

Conclusion

Overall, this literature review supports the need for a family-based program for childhood obesity. It was indicated in the literature that there are many detrimental health effects of obesity; therefore, efforts are needed to teach families ways to eat healthy and become physically active. A look at the role of parents in this phenomenon revealed that they have a significant impact on the health behaviors of their children. Without the involvement of parents in prevention programs, this impact cannot be improved upon. Last, there is a lack of published studies that examined the type of program recommended by the experts. That is one that takes place in the community, involves the entire family, and provides lessons on nutrition, physical activity, and behavior modification. In order to impact the health of the nation’s children there needs to be effective programs put in place. This project will add to this gap in knowledge and hopefully provide an effective childhood obesity prevention program.
CHAPTER 3
THEORETICAL FRAMEWORK

The use of a theoretical framework allows one to view a phenomenon in a more organized manner, assists in the development of interventions, and provides a framework for developing evaluation tools (Moran, Burson, & Conrad, 2014). For this project, the Health Promotion Model (HPM) was used to guide the intervention and methods of evaluation. This model provides a way to view the biopsychosocial processes that motivate individuals to engage in health promoting behaviors (Pender, Murdaugh, & Parsons, 2011). While the theoretical framework helps understand the phenomenon and guide the intervention and evaluation, intervention frameworks assist in project development and enactment. Rosswurm and Larrabee’s (1999) model of evidence-based practice change will be used for this project. This model was designed to assist practitioners through the process of integrating evidence into practice. The model begins with assessing the need for change and ends with integrating and maintaining this change. The aim of this chapter is to describe the theoretical and implementation frameworks.

Health Promotion Model

The HPM was developed by Pender and first appeared in the literature in 1982 (Pender, 2011). This model “is an attempt to depict the multidimensional nature of persons interacting with their interpersonal and physical environments as they pursue health” (Pender et al., 2011, p. 44). There are three major components to the HPM which include individual characteristics and experiences, behavior-specific cognitions and affect, and the behavioral outcome (Pender, 2011). Each of these components includes the many concepts of this theory as depicted in Figure 1.
Figure 1. The Health Promotion Model

Figure 1: The health promotion model. From “Health Promotion Model – Diagram” By N. J. Pender, 1996, retrieved from http://deepblue.lib.umich.edu/handle/2027.42/85351. Reprinted with permission.
Individual Characteristics and Experiences

People have certain characteristics and experiences that affect their behaviors. The concept of prior related behaviors indicates that past behaviors have a direct and indirect influence on the likelihood of engaging in similar health promoting behaviors. Personal factors including age, personality, race, ethnicity, and socioeconomic status also influence an individual’s behaviors (Pender et al., 2011).

Behavior-Specific Cognitions and Affect

This section of the model is considered the critical area for interventions because these concepts are modifiable. The model involves six behavior-specific variables including perceived benefits, perceived barriers, perceived self-efficacy, activity-related affect, interpersonal influences, and situation influences (Pender et al., 2011). Each of these variables will be further described.

Perceived benefits. Perceived benefits of action are “mental representations of the positive or reinforcing consequences of a behavior” (Pender et al., 2011, p. 46). Examples of perceived benefits may include increased alertness and energy, increased perceived attractiveness, monetary rewards, and social interactions. At first, the extrinsic benefits are what motivate individuals to partake in a particular behavior; however, it is the intrinsic benefits that help sustain the behavior (Pender et al.).
**Perceived barriers.** In addition to understanding what motivates someone to perform a health-promoting behavior, it will also be vital to understand what may be preventing them from performing the behavior. Perceived barriers to action are “perceptions about the unavailability, inconvenience, expense, difficulty, or time-consuming nature of a particular action” (Pender et al., 2011, p. 47). The presence of several barriers may lead to the avoidance of health promoting behaviors.

**Perceived self-efficacy.** Perceived self-efficacy is defined as “the judgment of personal capability to organize and carry out a particular course of action” (Pender et al., 2011., p. 47). It is a person’s judgment of his/her confidence to perform a certain task. An individual with a strong self-efficacy will put more effort into the task at hand (Bandura, 1977). A person’s experiences are what lead to good or poor self-efficacy. According to Bandura, self-efficacy is affected by four sources of information: performance accomplishments, vicarious experience, verbal persuasion, and emotional arousal. Performance accomplishment is based on an individual’s experience in mastering tasks. Successful experiences increase self-efficacy whereas failures decrease self-efficacy. In addition to gaining confidence in one’s ability by successful experiences, people also develop this confidence by seeing others perform activities without consequences. These are called vicarious experiences. Verbal persuasion is when someone is led to believe, through comments, that they can be successful (Bandura). The last source of information is emotional arousal. Bandura states that during a state of stress, people are less likely to expect success. This can be overcome by reducing stress.
Activity-related affect. Activity-related affect is an emotional arousal to an activity in relation to the act, the self, and the environment (Pender et al., 2011). These feelings can occur prior to, during, and following the behavior (Pender, 2011). An activity that produces a positive affect will likely be repeated whereas one that produces a negative affect will likely be avoided (Pender et al.).

Interpersonal influences. Interpersonal influences are thoughts and perceptions that involve the behaviors, beliefs or attitudes of others. It includes the expectations of others, social support, and learning from observing others. The primary sources of these influences are family, peers, and health care providers (Pender et al., 2011).

Situational influences. Situational influences are personal perceptions and cognitions of a situation that facilitate or impede behavior. Individuals are more likely to succeed in situations or environments in which they feel safe, compatible, related, and reassured. Locations that contain cues for the desired behaviors are likely to trigger action (Pender et al., 2011).

Commitment to a Plan of Action

Commitment to a plan of action is what motivates the individual to take action. Once there is a commitment, the behavior will take place unless there is a competing demand preventing the individual from moving forward. The theory states that the identification of specific strategies increases the likelihood that the behavior will be successful (Pender et al., 2011).
Immediate Competing Demands and Preferences

Pender et al. (2011) defined the component of immediate competing demands and preferences as “alternative behaviors that intrude into consciousness as possible courses of action immediately prior to the intended occurrence of a planned health-promoting behavior” (p. 49). These are the demands that can halt the commitment to a plan of action. For example, an individual plans to make a healthy meal option but they select a food high in fat and calories instead, based on their preference for the taste. It takes a strong commitment to their plan and self-regulation to inhibit these competing preferences (Pender et al.).

Behavioral Outcome

The last component of the HPM is the behavioral outcome, engaging in health-promoting behavior. This is focused on the individual attaining positive health outcomes and reaching their desired behavior (Pender et al., 2011). A couple examples of health-promoting behaviors are increasing physical activity and improving nutrition (Pender, 2011).

The Model for Evidence-Based Practice Change

In order to provide the best evidence-based care to their patients, health care professionals need to bring research into practice. In order to facilitate this process, Rosswurm and Larrabee (1999) presented a model in which practitioners are “guided through the entire process of developing and integrating an evidence-based practice change” (p. 317). There are six steps in the implementation model which will be further reviewed.

According to Rosswurm & Larrabee (1999), the first step in the model is assessing the need for a practice change. This step involves identifying the stakeholders and including them in the change, collecting and comparing internal and external data, confirming the need for the practice change, and identifying the practice problem. Once it has been determined that there is a
need for change and the stakeholders have been identified and included, the problem needs to be linked to interventions and outcomes. The practitioner should identify potential interventions for the problem and select appropriate outcome indicators. The next step in the model is to perform a literature search seeking the best evidence for the practice change. This literature should be critiqued and synthesized. One should also assess feasibility, benefits, and risks. After the evidence has been synthesized the proposed change needs to be defined. Practitioners should use the evidence to guide their proposed change, identify needed resources, create an implementation process, and define outcomes. When the planning process is complete, a pilot study should be implemented. During the evaluation process, it will be determined if the change needs to be adapted, adopted, or rejected. The last step in the model is integrating and maintaining the change in practice. This step involves communicating the change to the stakeholders, educating staff on the practice change, integrating it into practice, and monitoring the process and outcomes.

Conclusion

The focus of this project was to implement an evidence-based intervention to address the problem of childhood obesity in a rural county in west Michigan. The concepts of the HPM aligned well as a theoretical framework for this project. The individual’s prior related behavior, personal factors, perceived benefits, perceive barriers, perceived self-efficacy, activity-related affect, interpersonal influences, situational influences, competing demands, and commitment to the plan were taken into consideration throughout the intervention in order to guide the families to success. The Model for Evidence-Based Practice Change offers step-by-step guidance on how to recognize the need for problem and implement an evidence-based change. Therefore, this model was an idea framework for this project.
CHAPTER 4

METHODS

The purpose of this chapter is to describe the implementation of the dissertation project. This project was conceptualized using a model for evidence-based practice change as described in chapter 3. This model has six steps including assessing the need for change in practice, linking the problem to an intervention and outcomes, synthesizing the best evidence, designing a practice change, implementing and evaluating the change, and integrating and maintaining the change (Rosswurm & Larrabee, 1999). Each phase of this project will be explained in detail following this implementation model. This chapter will also apply the six behavior-specific variables from the Health Promotion Model (HPM) to the project. These include perceived benefits, perceived barriers, perceived self-efficacy, activity-related affect, interpersonal influences, and situation influences (Pender et al., 2011).

Assessing the Need for Change

This project began when a health coalition expressed the need for an intern to assist them in addressing the problem of obesity in a rural Midwestern county. Specifically, they wanted to implement a program that provided education to families on how to live a healthy life. The doctoral student became a member of this coalition for the duration of this project. The coalition was formed in 2012 as an effort to reduce obesity among the residents in the county. A local hospital serving the county and the local health department are the partners of this coalition. There are also many community organizations that help support the coalition and their efforts.
The organizations with members that were directly involved in the planning and implementation of this project include the YMCA, and two pediatric primary care offices. After meeting with two representatives from the coalition, it was decided that the doctor of DNP student would be able to help lead this proposed project.

The need for an intervention was determined by reviewing the 2013 results of the Michigan Profile for Healthy Youth. This survey indicated that youth in the target county have poor health behaviors in regards to physical activity and nutrition (Michigan Department of Education, 2014). One of the sponsoring agencies of the coalition also conducted a community health needs assessment. It was determined through this assessment that the residents of the target county have poor health behaviors because of inadequate physical activity, lack of education about healthy foods, and lack of access to recreational facilities. These data support the need for a change in the county.

**Linking the Problem**

The coalition previously received a manual from a childhood obesity treatment program called FitKids360 for which they received permission from the owners to adapt the program to meet the community’s needs and resources (J. Dalman, personal communication, July 25, 2014). This program was used as a guide to address the problem of obesity in the county. The DNP student in collaboration with the coalition reviewed this manual to determine the evidence-based components that would fit the needs of their population. The targeted population included families in the county that were in need of and interested in learning more about physical activity and nutrition and how to modify their behaviors. The program was adapted as a prevention and education program rather than a treatment program.
The program was renamed by the coalition as B.Healthy Families. The goals and outcomes of this intervention were defined by the DNP student and the coalition as increased caregiver and child knowledge, improved healthy behaviors, and increased utilization of the 5-2-1-0 initiative.

**Synthesizing the Evidence**

As presented in chapter 2, the DNP student completed a thorough review of the best evidence for the practice change. Research supports childhood obesity prevention programs that are family-based and take place in the community. These programs should include education about nutrition, physical activity, and behavior change (ADA, 2006; National Institutes of Health, 2008; Pratt, Stevens, & Daniels, 2008).

**The Practice Change/Implementation**

The evidence that was found in the literature review was used to guide the intervention and define and measure the outcomes. The DNP student identified the needed resources for the project as a local foundation, individuals to teach the sessions, the YMCA, health care providers, and volunteers. The DNP student collaborated with the coalition members to create a detailed implementation plan. A pediatrician and a family nurse practitioner from the coalition were the two community individuals most involved in the project. A general outline for weekly classes was created at the beginning of the program and was expanded on throughout the program. The behavior lessons included the following topics: setting goals, emotions, bullying, self-esteem, sleep, stress management, and balance. The nutrition lessons focused on the 8-0 lesson, reading food labels, MyPlate, beverages, meal planning, eating out, school lunches, grocery tips, and eating breakfast. The lessons incorporated hands on experience reading food labels and creating a healthy plate, a demonstration to show the amount of sugar in beverages, a PowerPoint presentation, and interactive discussions. The 8-0 lesson promoted eight hours of sleep each
night, seven breakfasts each week, six home-cooked meals each week, five servings of fruits and vegetables each day, four positive self messages each day, three servings of dairy each day, two hours or less of screen time each day, one hour or more of physical activity each day, and zero sugary drinks each day. Last, the physical activity component involved teaching the families the importance of physical activity and the different types of activity. Throughout the classes, families participated in short activities to keep them moving, with a longer physical activity session at the end of the class. Also incorporated into these lessons were ways to overcome barriers. Volunteers from an array of specialties were recruited to teach the lessons. Classes were taught by registered dieticians, nurse practitioners, a physician, the DNP student, a registered nurse, exercise specialists, and a school counselor.

The recruitment process involved five health care providers in the community recommending families to the program. These families were identified by the provider as having a need for and interest in education about physical activity, nutrition, and behavior change. There were no specific exclusion criteria used for this selection. The goal was to have a total of 20 children and their caregivers participate in the program. The health care provider filled out a recruitment form with the child’s name and age, parent’s name, their contact information, why they wanted their child to attend the B.Healthy Families program and their most recent height, weight, and body mass index.

The program took place at the local YMCA. As previously discussed, according the HPM, location and environment are important as they can contain cues for the desired behavior (Pender et al., 2011). This facility was chosen for several reasons; it is centrally located in the county, there was no charge for using the facility, there was enough space in the building for the physical activity sessions, and the focus of the organization is on being active. We were also able to
control the environment here. There was no place to purchase unhealthy snacks or drinks and no access to electronic devices. There were also no distractions as we were the only individuals at the facility.

Sessions were held on Mondays from 6:00 p.m. to 8:00 p.m. starting October 13\textsuperscript{th} and ending November 17\textsuperscript{th}. Prior to the start of the program, a flyer was sent out to all families to remind them of the dates, times, and locations of the classes. Families also received a telephone reminder from the individual making phone calls for data collection. At the beginning of the first class, families were provided with a folder of information. This folder contained a welcome letter, a shared medical consent and waiver (Appendix A), a weekly family goals worksheet (Appendix B), the program weekly schedule (Appendix C) and the questionnaires for data collection. This information was reviewed with the families at the beginning of the class. During the second class, families were asked to provide either an email or cell phone number with text messaging in order to receive weekly reminders about the class. Each week the DNP student sent out these reminders.

When the children and their caregivers arrived to the classes, they were asked to sign in and put on a name tag. Each week of the program, families were encouraged to create an attainable goal for the week. By reaching goals and making progress throughout the program, families would gain confidence leading to an improved perceived self-efficacy. Most classes began with a short discussion of these goals followed by a review of the previous lessons. The review was done to remind participants what they had learned and to inform those who may have missed a class. After the review, a lesson was provided on behavior modification. This lesson lasted approximately 30 minutes. Next, as a way to keep the participants from getting restless and to keep them moving, a 10-15 minute activity was done. This involved activities such as a walk
outside, relay races, and other games. The nutrition lesson was next lasting about 30 minutes. The last part of the classes involved a longer activity. These activities included jump roping, exercise stations, games with balls, and a dance video. Most of these were geared at fun activities the families could do at home. This was done to promote a positive affect and to prevent barriers such as financial constraint so the behaviors would be repeated in the future (Pender et al, 2011). The children, caregivers, volunteers, DNP student, and health care providers all participated in these activities. According to the HPM, interpersonal influences are an important aspect of successful behavior change (Pender et al, 2011). By all individuals participating in the activities, it offered support to the families and modeled appropriate behaviors. Seeing other individuals successfully participate in these activities is also a way for the families to gain confidence in their abilities and improve their self-efficacy (Bandura, 1977).

In order to keep participants excited about the program, and to encourage them to come back each week, incentives were provided. At the beginning of the program, the children were provided with a name badge. Each week they attended, they received a charm to attach to their badge. This was done to encourage the children to try and collect all of the charms by attending each class. In addition, children and parents were given a variety of incentives including notepads, bags, measuring cups, balls, jump ropes, journals, pens, gum, cutting boards, jar openers, and t-shirts. The YMCA also offered incentives. First, they offered each child free participation in one sporting session of their choice, for example spring baseball. They also waived the entry fee for the entire family to participate in the local 5k run/walk held on Thanksgiving Day. The last incentive was provided by a local wellness center and included a pass for three free visits.
The extrinsic benefits of the B. Healthy Families intervention were identified by the doctoral student as the ability to interact with other families facing the same problems and incentives for attending the classes. Intrinsic benefits were identified as increased energy and alertness from the improvement in physical activity and healthy eating. As discussed in chapter three, these benefits will help the families to be motivated to engage in the behaviors and help them sustain the behaviors (Pender et al., 2011).

**Evaluation**

Data collection took place by the DNP student at the first and last sessions. When participants arrived, the questionnaires were provided and they were asked to return the questionnaires upon completion. It is important to note, this was not done in a controlled setting. Due to poor attendance at the last class, a follow-up letter and the questionnaires were mailed to those who did not attend. In addition, text messages were sent to these families as a reminder to complete and return the forms. The obtained data were kept anonymous in order to protect the participants. In order to accomplish this, participants were asked not to write any identifying information on their questionnaires. Instead, a number correlated with the sign-in sheet was written on the questionnaire. These documents were placed in a locked file box and kept in a secure place at a local university.

Quantitative data were obtained regarding knowledge, behaviors, and utilization of 5-2-1-0. Knowledge about physical activity and nutrition was measured using a questionnaire designed specifically for this project. A separate questionnaire was used for the children and parents in order to meet the cognitive needs of each age group (Appendix D).
The *Family Nutrition and Physical Activity* screening tool by Ihmels, Welk, and the American Dietetic Association (n.d.) was used to evaluate healthy behaviors (Appendix E), and the utilization of the 5-2-1-0 initiative was measured using the “Healthy Habits Questionnaire” (Let’s Go, 2012b). Questionnaires were handed out and completed during the first and last sessions.

Qualitative data were collected through a phone interview using two questionnaires based on the Health Promotion Model (Appendix F). Created by Pender (2011) one of these questionnaires focused on physical activity and the other nutrition. These interviews were done by a registered nurse in the bachelors of science in nursing program at a local university. The pre-intervention information included an assessment of prior behaviors, personal influences, interpersonal influences, social support, role models, situational influences, and commitment to the plan. The post-intervention questions explored competing demands and preferences encountered throughout the program.

**Integration and Maintenance**

After the completion of this dissertation, the DNP student discussed with the coalition the study findings, strengths, and limitations. This information was used to make suggestions for the future of the B. Healthy Families program. It was hoped that this information will provide the coalition with the necessary information needed to maintain a successful and sustainable childhood obesity prevention program in the target county.
CHAPTER 5

RESULTS

The purpose of this chapter is to report the results from the B.Healthy Families program. The aim of this project was to improve healthy behaviors, increase knowledge of nutrition and physical activity, and increase utilization to the 5-2-1-0 initiative among participants. The Health Promotion Model (HPM) was used to determine how the participants’ interpersonal and physical environments might impact their journey to achieving these outcomes. Data analysis was accomplished using the Statistical Package for the Social Sciences, Version 20 (SPSS 20). For the purpose of this project, a significance level of 0.10 was considered appropriate due to the small sample size and the difference between the pre and post data is not expected to be substantial (Labovitz, 1968).

Participants

A total of 20 children plus their caregivers were recruited for this program. Of the 20 children, six never attended. Attempts were made to connect with those who did not attend by the nursing student who was making phone calls for the HPM questionnaires. On week three, two children joined the program and attended three total sessions. Therefore, a total of 16 children participated in the program. Of these children, there were four sets of siblings giving the program a total of 12 families. A total of ten mothers, four fathers, one grandmother, and one grandfather participated at some point throughout the program. For several families, the caregiver who attended the sessions each week was not consistent. This affected data collection because one family had the father answer the questionnaires before the program and the mother after the program. Families were not asked if the child lived with the caregiver attending the classes. Only three children showed up to all six classes.
The last session was only attended by six children (four families) due to inclement weather. The average number of attended sessions was four.

Demographics

The only demographic information gathered from the children included their gender and age. Males represented 43.7% of the participants (n=7) with females representing the other 56.3% (n=9). Participants ranged in age from 5 to 14 years with an average age of 10.6 years. When primary care providers sent their referrals, they included the children’s most recent height, weight, and BMI. Providers did not include a date when the measurements were taken. This was not done for the two participants that joined during week three. All fourteen of these children had BMIs above the 95th percentile which categorizes them as obese.

Quantitative Data

Family Nutrition and Physical Activity

To measure healthy behaviors, the Family Nutrition and Physical Activity screening tool was used. This is a 20 item survey asking questions about the family’s behaviors related to nutrition and physical activity. Answers are on a 4-point scale and include: almost never, sometimes, usually, and almost always. This questionnaire was completed by eleven families prior to the program and six families after the program. These data were analyzed using the Wilcoxon Matched-Pairs Signed-Rank Test (Table 1). Questions were reprinted with permission (Appendix G). Parametric testing was not done because the data was ordinal. None of the questions showed a significant change in behavior after the program.
<table>
<thead>
<tr>
<th>Items</th>
<th>Pre Mdn</th>
<th>Post Mdn</th>
<th>Amount of Change</th>
<th>Direction of Change</th>
<th>Wilcoxon Z Score</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My child eats breakfast...</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>↑</td>
<td>-1.414</td>
<td>0.157</td>
</tr>
<tr>
<td>2. Our family eats meals together...</td>
<td>3</td>
<td>2.5</td>
<td>0.5</td>
<td>↓</td>
<td>-1.000</td>
<td>0.317</td>
</tr>
<tr>
<td>3. Our family eats while watching TV...</td>
<td>1</td>
<td>0.5</td>
<td>0.5</td>
<td>↓</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>4. Our family eats fast food...</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>-</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>5. Our family uses microwave or ready to eat foods...</td>
<td>0</td>
<td>0.5</td>
<td>0.5</td>
<td>↑</td>
<td>-1.000</td>
<td>0.317</td>
</tr>
<tr>
<td>6. My child eats fruits and vegetables at meals or snacks...</td>
<td>2</td>
<td>2.5</td>
<td>0.5</td>
<td>↑</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>7. My child drinks soda pop or sugar drinks...</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>↑</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>8. My child drinks low fat milk at meals or snacks...</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>-</td>
<td>-0.816</td>
<td>0.414</td>
</tr>
<tr>
<td>9. Our family limits eating of chips, cookies, and candy...</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>-</td>
<td>-1.000</td>
<td>0.317</td>
</tr>
<tr>
<td>10. Our family uses candy as a reward for good behavior...</td>
<td>0</td>
<td>0.5</td>
<td>0.5</td>
<td>↑</td>
<td>-0.577</td>
<td>0.564</td>
</tr>
<tr>
<td>11. My child spends less than 2 hours on TV/games/computer per day...</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>-</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>12. Our family limits the amount of TV our child watches...</td>
<td>2</td>
<td>2.5</td>
<td>0.5</td>
<td>↑</td>
<td>-1.414</td>
<td>0.157</td>
</tr>
<tr>
<td>13. Our family allows our child to watch TV in their bedroom...</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>-</td>
<td>-0.577</td>
<td>0.564</td>
</tr>
</tbody>
</table>
Table 1 Continued

<table>
<thead>
<tr>
<th>Items</th>
<th>Pre Mdn</th>
<th>Post Mdn</th>
<th>Amount of change</th>
<th>Direction of change</th>
<th>Wilcoxon Z score</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>14. Our family provides opportunities for physical activity...</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>-</td>
<td>-1.000</td>
<td>0.317</td>
</tr>
<tr>
<td>15. Our family encourages our child to be active every day...</td>
<td>3</td>
<td>2.5</td>
<td>0.5</td>
<td>↓</td>
<td>-1.414</td>
<td>0.157</td>
</tr>
<tr>
<td>16. Our family finds ways to be physically active together...</td>
<td>2</td>
<td>2.5</td>
<td>0.5</td>
<td>↑</td>
<td>-0.272</td>
<td>0.785</td>
</tr>
<tr>
<td>17. My child does physical activity during his/her free time...</td>
<td>1</td>
<td>1.5</td>
<td>0.5</td>
<td>↑</td>
<td>-1.000</td>
<td>0.317</td>
</tr>
<tr>
<td>18. My child is enrolled in sports or activities with a coach or leader...</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>-</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>19. Our family has a daily routine for our child's bedtime...</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>↑</td>
<td>-0.577</td>
<td>0.564</td>
</tr>
<tr>
<td>20. My child gets 9 hours of sleep a night...</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>↑</td>
<td>-1.000</td>
<td>0.317</td>
</tr>
</tbody>
</table>

Despite the lack of an overall significant change in behavior, several behaviors did show an improvement including those presented in questions 1, 3, 6, 12, 16, 17, 19, and 20. However, four behaviors worsened which are presented in questions 5, 7, 10, and 15. After taking a closer look at the data, the behaviors in questions 5, 7, and 15 did not actually decline; rather the median was affected by the number of individuals who answered the question. This seems to also be true for questions 3 and 6 that showed an improvement. It should also be taken into consideration that one family did not complete the pre questionnaire but did complete the post questionnaire, so it is possible their answers slightly affected the outcomes.
5-2-1-0 Healthy Habits Questionnaire

The 5-2-1-0 Healthy Habits Questionnaire was a 10 item survey asking questions about family behaviors related to the 5-2-1-0 initiative as described in chapter 1. Eleven parents completed the questionnaire before the program started and six families completed it after the program. Questions 1 through 5 and question 8 were open-ended questions. Most families provided a single digit answer; however, some families gave an interval. For coding purposes, a coin was flipped for the interval answers to determine which number in the interval would be used. Heads signified a correct answer and tails incorrect. For example, if a family said their child eats 3-4 servings of vegetables a day, a coin was flipped to determine if this would be coded as three servings or four servings. A visual inspection of histograms and a calculation of the skewness and kurtosis was completed and it was determined that not all of these data were normally distributed. Therefore, this data was evaluated using the Wilcoxon Matched-Pairs Signed-Rank Test (Table 2). Of the six questions evaluated, one question showed a significant positive change. This was the question “how many servings of fruits or vegetables does your child eat a day?” (Z=-1.732, p=0.083). The other question to show some improvement was “How many times a week does your child eat dinner at the table together with the family?” The median for the other four questions remained the same.
Table 2

5-2-1-0 Questionnaire Medians and Wilcoxon

<table>
<thead>
<tr>
<th>Items</th>
<th>Pre Mdn</th>
<th>Post Mdn</th>
<th>Amount of change</th>
<th>Direction of change</th>
<th>Wilcoxon Z Score</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How many servings of fruits or vegetables does your child eat a day?</td>
<td>3</td>
<td>3.5</td>
<td>0.5</td>
<td>↑</td>
<td>-1.732</td>
<td>0.083*</td>
</tr>
<tr>
<td>2. How many times a week does your child eat dinner at the table together with the family?</td>
<td>5</td>
<td>5.5</td>
<td>0.5</td>
<td>↑</td>
<td>-0.368</td>
<td>0.713</td>
</tr>
<tr>
<td>3. How many times a week does your child eat breakfast?</td>
<td>7</td>
<td>7</td>
<td>0</td>
<td>-</td>
<td>-1.342</td>
<td>0.180</td>
</tr>
<tr>
<td>4. How many times a week does your child eat takeout or fast food?</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>-</td>
<td>-1.134</td>
<td>0.257</td>
</tr>
<tr>
<td>5. How many hours a day does your child watch TV/movies or sit and play video/computer games?</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>-</td>
<td>-1.000</td>
<td>0.317</td>
</tr>
<tr>
<td>8. How much time a day does your child spend in active play?</td>
<td>1 hour</td>
<td>1 hour</td>
<td>0</td>
<td>-</td>
<td>-0.577</td>
<td>0.564</td>
</tr>
</tbody>
</table>

Note: *p<0.10

Questions six and seven are displayed in Figures 2 and 3 respectively. The percent of families who allow a TV in the room where the child sleeps decreased overtime. However, the percent of children with a computer in their room appears to have increased slightly. This is not a true increase. When looking at the data for this question, the parents who answered this question both before and after the program answered it exactly the same both times (n=5). One family answered it after the program only and responded no to the question. Therefore, it can be determined that there was not an increase in children with computers in their room; the percentage was simply affected by the small number of respondents post program.
Does your child have a TV in the room where he/she sleeps?

![Bar chart showing percentages of yes and no responses for TV in the room before and after a program. Pre: Yes 82%, No 18%; Post: Yes 67%, No 33%]

*Figure 2. Question #6 of the 5-2-1-0 Questionnaire.*

Does your child have a computer in the room where he/she sleeps?

![Bar chart showing percentages of yes and no responses for computer in the room before and after a program. Pre: Yes 82%, No 18%; Post: Yes 83%, No 17%]

*Figure 3. Question #7 of the 5-2-1-0 Questionnaire.*
Question nine on the survey read “How many 8-ounce servings of the following does your child drink a day?” The drink options included 100% juice, fruit drinks or sports drinks, soda or punch, water, whole milk, and nonfat or reduced fat milk. To effectively evaluate the responses, only the participants who answered this question at both time points were included. A bar graph was created to represent the total ounces of each drink consumed by all of the participants combined (Figure 4).

*Figure 4. Question #9 of the 5-2-1-0 Questionnaire.*
Question ten asked the parents one thing they would like to help their child change. The top four choices prior to the program were eat more fruits and vegetables (n=3), eat less fast food/takeout (n=3), spend less time watching TV/movies and playing video/computer games (n=2), and drink more water (n=2). After the program, three of the top four choices remained the same. Instead of eating more fruits and vegetables, parents wanted to help their child play outside more often (n=2).

Knowledge Questionnaires

To measure knowledge of nutrition and physical activity in both parents and children, two sets of questionnaires were used. One set was created to target the parents and the other specifically for the children. Frequency tables are provided for questions that showed a change before and after the program.

Eleven parents completed these questionnaires before the program and six completed them after the program. For the first section of the parent nutrition survey, parents scored 100% at both collection points. Scores varied for the second section of his survey as displayed in Table 3. For the question “How many servings of fruits and vegetables should your child consume each day?” improvement is likely a result of the focus on the 5-2-1-0 initiative. In regards to question seven “How many servings of dairy should your child consume each day?” answers were quite varied before and after the program. These results are surprising as this was discussed more than once in class and parents were given handouts with this information. The improvement in question eight, “What is a balanced diet?” is likely an outcome of the lessons provided on MyPlate which focuses on eating food from all food groups.
Table 3

*Parent Nutrition Questionnaire Frequency Table*

<table>
<thead>
<tr>
<th>Questions/Answers</th>
<th>Pre Intervention</th>
<th>Post Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>1. How many servings of fruits and vegetables should your child consume each day?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three</td>
<td>1</td>
<td>8.3</td>
</tr>
<tr>
<td>Four</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td><strong>Five</strong></td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>Six</td>
<td>5</td>
<td>41.6</td>
</tr>
<tr>
<td>2. How many servings of dairy should your child consume each day?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Two</td>
<td>4</td>
<td>36.4</td>
</tr>
<tr>
<td><strong>Three</strong></td>
<td>6</td>
<td>54.5</td>
</tr>
<tr>
<td>Four</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3. What is a balanced diet?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eating lots of fruits and vegetables</td>
<td>3</td>
<td>27.2</td>
</tr>
<tr>
<td>Eating the same foods everyday</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Eating the exact same amount of food from each food group</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Eating different foods from all of the food groups</strong></td>
<td>8</td>
<td>72.7</td>
</tr>
<tr>
<td>4. Which of the following is a healthy snack for your child?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potato chips with dip</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Popcorn with salt and butter</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Whole-wheat crackers and cheese</strong></td>
<td>6</td>
<td>100</td>
</tr>
<tr>
<td>Cookies and milk</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Note: Correct answers are in boldface.*
For the six item adult physical activity knowledge questionnaire, all parents answered three of six questions correctly both before and after the program. The results of the other three items are displayed in Table 4.

Table 4

*Parent Physical Activity Knowledge Questionnaire Frequency Table*

<table>
<thead>
<tr>
<th>Question/Answers</th>
<th>Pre Program</th>
<th>Post Program</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>1. A good activity to strengthen leg muscles is:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stretching</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>Push-ups</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Squats</strong></td>
<td>9</td>
<td>82</td>
</tr>
<tr>
<td>Pull-ups</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2. What is the maximum amount of time your child should spend watching TV, playing video games and using the computer each day?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 hour</td>
<td>6</td>
<td>54.5</td>
</tr>
<tr>
<td><strong>2 hours</strong></td>
<td>5</td>
<td>45.5</td>
</tr>
<tr>
<td>3 hours</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4 hours</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4. What is the minimum amount of time your child should spend doing physical activity each day?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 minutes</td>
<td>2</td>
<td>18.1</td>
</tr>
<tr>
<td>90 minutes</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20 minutes</td>
<td>1</td>
<td>9.1</td>
</tr>
<tr>
<td><strong>60 minutes</strong></td>
<td>8</td>
<td>72.8</td>
</tr>
</tbody>
</table>

*Note: Correct answers are in boldface.*
A total of fourteen children completed the questionnaires prior to the program and nine completed them after the program. For the child nutrition knowledge questionnaire, all children were able to identify frozen yogurt, toast, a salad, and an apple as the healthier of two listed items. The other three items that children answered incorrectly are displayed in Table 5. Question 2 showed improvement overtime, however, questions 3 and 7 worsened. The child that answered both questions incorrectly only took the survey after the program. Therefore, this child’s prior knowledge is not reflected in the data collected before the program started.

Table 5

Child Nutrition Knowledge Questionnaire Frequency Table

<table>
<thead>
<tr>
<th>Questions/Answers</th>
<th>Pre Program</th>
<th>Post Program</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Circle one of the two foods that you think is better for your health.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Baked Potato</td>
<td>13</td>
<td>92.9</td>
</tr>
<tr>
<td>French Fries</td>
<td>1</td>
<td>7.1</td>
</tr>
<tr>
<td>3. Low Fat or Skim Milk</td>
<td>14</td>
<td>100</td>
</tr>
<tr>
<td>Regular Milk</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7. Water</td>
<td>14</td>
<td>100</td>
</tr>
<tr>
<td>Juice</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: Correct answers are in boldface.

Children only answered two items on the 7-item physical activity questionnaire correctly at both time points. They understood that playing ball was better for their health than watching television and cleaning the house was better than playing video games. The questions they answered incorrectly can be found in Table 6.
The same child that answered the nutrition answers incorrectly post program also answered questions 1, 5, and 6 incorrectly on the physical activity questionnaire, affecting these scores as well. Similar to the parents, children also showed improvement in understanding how much time they should spend participating in physical activity, and that watching TV, playing video games, and using a computer should be limited to two hours.

Table 6

*Child Physical Activity Knowledge Questionnaire Frequency Table*

<table>
<thead>
<tr>
<th>Questions/Answers</th>
<th>Pre Intervention</th>
<th>Post Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>1. A good activity to strengthen your leg muscles is:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Squats</td>
<td>10</td>
<td>71.4</td>
</tr>
<tr>
<td>Stretching</td>
<td>4</td>
<td>28.6</td>
</tr>
<tr>
<td>2. What is the maximum amount of time you should spend watching TV, playing video games and using the computer each day?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Hours</td>
<td>13</td>
<td>92.9</td>
</tr>
<tr>
<td>4 Hours</td>
<td>1</td>
<td>7.1</td>
</tr>
<tr>
<td>4. How much total time should you spend each day doing physical activity?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 minutes</td>
<td>2</td>
<td>14.3</td>
</tr>
<tr>
<td>60 minutes</td>
<td>12</td>
<td>85.7</td>
</tr>
<tr>
<td>5. A good activity to strengthen your arm muscle is:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soccer</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Push-ups</td>
<td>14</td>
<td>100</td>
</tr>
<tr>
<td>6. Which activity is good for your heart?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifting weights</td>
<td>1</td>
<td>7.1</td>
</tr>
<tr>
<td>Running</td>
<td>13</td>
<td>92.9</td>
</tr>
</tbody>
</table>

*Note: Correct answers are in boldface.*
Qualitative Data

The qualitative data were analyzed for themes. These data are displayed by the concepts of the HPM. Self-efficacy was measured quantitatively, however, will be reported here due to its relation to the other HPM concepts. A total of 11 families completed these questionnaires. Parents who had two children in the program completed the questionnaire twice, one for each child (n=3). Therefore, a total of 14 questionnaires were completed.

Prior Behavior

Parents were asked what prior attempts their child(ren) have made to become physically active and to eat healthy. Families reported that the children participated in high or low impact activities. Of the 14 responses, 12 indicated some type of high or low impact activity. This included activities such as sports, walking, and riding bike. Two of the parents indicated they restricted sedentary behaviors as an attempt to become more physically active. Overall, parents felt their children liked participating in activities; however, they needed a lot of encouragement to stay engaged. In regards to healthy eating, most families reported having met with a registered dietician in the past. They have learned from their experiences which foods are healthy and ways to incorporate those foods into their diets.

Benefits

When asked about the benefits of becoming more active, families stated that it improves self-esteem, improves overall health and it prevents disease. Similar responses were found regarding nutrition and included improved overall health and prevention of disease.
**Barriers**

Families identified barriers to physical activity as physical and emotional discomfort, winter weather, and the desire to play video games. Barriers to eating healthy included the desire to eat sugary foods and large portion sizes.

**Self-Efficacy**

Parents were asked the following question regarding physical activity and nutrition “How sure are you that your child can overcome these barriers to being more active?” Parents were provided with a 10-point scale with 1 meaning uncertain and 10 meaning very sure. The average self-efficacy score for physical activity was 7.7 with a range of 1-10. For nutrition, the average score was 8.2 with a range of 5-10.

**Activity-Related Affect**

Families stated that the activities they enjoyed most were sports, low-impact activities, and playing/working outside. Families identified their favorite healthy foods as a variety of fruits and vegetables.

**Interpersonal Influences**

Of the 11 families, seven of them reported that none of their family members expect them to be physically active and four of them stated, that yes they have someone that expects them to be physically active. Of those who stated yes, the individuals who expected the children to be physically active were the parents. Identified social support included family, and friends. All but one family stated they have a role model that is physically active 3-5 times every week. The identified role models included parents and friends who participate in a variety of physical activities.
Of the 11 families, 6 stated none of their friends or family members expect them eat healthy and 5 stated that yes, they have someone that expects them to eat healthy. Of those who stated yes in the previous question, the individuals who expected the children eat healthy were the parents. Identified social support included family, and friends. All of the families stated they have a role model who eats healthy most of the time. The identified role models included parents and friends. The role models eat a variety of healthy foods including grilled meats, fruits and vegetables.

**Situational Influences**

Families identified school and outside as the two most common places where they can be physically active. The families felt they could find healthy food they could eat and enjoy at home and at school.

**Commitment to a Plan of Action**

In general, families stated they were ready to commit to a plan of action. Only two families said that were unsure if they were ready to increase physical activity, and only one family said they were unsure if they were ready to start eating healthy.

**Competing Demands and Preferences**

This question was asked at the end of the program, and several of the families did not follow-up. Of those who responded (n=8), most of the families stated they did not encounter any competing demands or preferences when trying to become more active. One family stated the child had been sick and was therefore not active, another family stated the child enjoys lying in bed and reading which interfered with activity.
When asked how they might avoid these problems in the future, only three families provided a specific answer and stated they would avoid problems by trying to stay motivated. The other families felt they were doing very well and did not have any problems they needed to avoid.

Most of the families also stated they did not encounter any problems trying to eat healthier. Those who encountered a problem stated they had trouble choosing healthy foods and staying on track. Of the 8 families that provided an answer, most of the families stated that they can avoid future problems by keeping on track.

**Conclusion**

The only statically significant results from this program included the increase in fruit and vegetable consumption. There was a large difference in number of respondents between the pre and post data. If more participation was seen in the post data collection, outcomes may have been more significant. The variability of caretakers who attended also may have affected the outcomes. Those who completed the questionnaires were not necessarily present at each session. These factors affected the interpretation of the findings and should be taken into consideration for future interventions.
CHAPTER 6
DISCUSSION

The purpose of this scholarly project was to determine the effectiveness of the B.Healthy Families program at increasing knowledge of nutrition and physical activity, increase utilization of the 5-2-1-0 initiative and improve healthy behaviors. This chapter will provide a discussion of the project results, relate these findings to the HPM, present the strengths and limitations, analyze the sustainability of the project, provide recommendations, and discuss the roles of the doctorally-prepared advanced practice nurse in relationship to this project. Chapters 4 and 5 addressed the first five steps of Rosswurm and Larabee’s (1999) model. The final step, integrating and maintaining the change in practice, will also be addressed in this chapter.

Results

Literature Review

A literature search presented in chapter 2 revealed a lack of studies that included a prevention intervention that is community- and family-based, and includes lessons on physical activity, nutrition, and behavioral modification. Five studies were reviewed and their limitations evaluated. The identified limitations from these studies that were addressed in this project included a lack of a strong family component and measurement of all three educational components; nutrition, physical activity, and behavior modification. This project had a strong focus on the family, including both children and parents in all of the lessons and physical activities. The three educational components were measured through knowledge and behavioral questionnaires. This literature search was repeated to determine if any new research had been published since the first search, however, the search did not reveal any new research meeting the criteria described in chapter 2.
Behavior

The Family Nutrition and Physical Activity screening tool was used to measure changes in behavior. It was determined that the families did not have a significant change in behaviors after the program. A positive trend was seen in eating breakfast, eating while watching television, eating fruits and vegetables, limiting television, families engaging in physical activities together, child doing physical activity in his/her free time, having a bedtime routine, and getting adequate sleep. These results will be compared to four of the studies evaluated in the literature review. The results will not be compared to the study by Chomitz et al. (2010) because they only measured weight status and fitness test scores, two items that were not addressed in this dissertation project.

The eight session program by Weaver et al. (2014) found similar results as the B.Healthy Families program. They determined that their program led to an increase in several positive behaviors; however, the only statistically significant finding was a positive change in mental health status. This was not the case in the study by Joosse et al. (2008). They found a statistically significant change in healthy habits after their 12-week program. This difference in outcomes could be related to the length of the program. The B.Healthy Families program lasted 6 weeks compared to the 12-week program by Joosse et al. The study by Wright et al. (2012) was also a 6-week program. They measured dietary behaviors only. Their results revealed a significant increase in consumption of fruit and vegetables, and choosing 100% fruit juice over other juices. However, these data were obtained at a 12-month follow-up and not immediately after the program. Schwartz et al. (2012) also found some significant positive behavioral changes after their program, however, their program involved 6 months of organized physical activity and ten nutrition sessions.
They also gathered data 3 months and 12 months after the intervention. The major differences between the programs that showed statistically significant behavior changes and the B.Healthy Families program were the length of the programs and the point at which data collection took place.

**Knowledge**

Overall, families did fairly well on the knowledge questionnaires both before and after the program. Therefore, a significant change in knowledge was not seen. Improvement in knowledge was seen in the following parent areas: knowing the recommended number servings of servings of fruits and vegetables and the numbers of hours children should spend participating in sedentary activities and physical activity, and understanding the concept of a balanced diet. The children also showed improvement in their understanding of the number of hours they should spend engaging in physical activity and that time spent participating in sedentary activities should be limited. All of these topics were discussed throughout the program. Minimal improvement was seen in one question on the adult physical activity questionnaire. This was choosing the activity that is best for strengthening leg muscles. The correct answer was squats. Two parents prior to the program and one parent after the program chose stretching. Within the sessions, families were not taught the benefit of specific exercises, which could be a reason for this incorrect answer. One result that was surprising was the servings of dairy parents believed their child(ren) should consume each day. Answers varied from one, two and three before the program and two, three and four after the program. This was something that was discussed in each class and was highlighted in several handouts.
5-2-1-0 Utilization

Parents completed the 5-2-1-0 Health Habits Questionnaire both before and after the program. Their answers revealed a statistically significant improvement in the number of servings of fruits and vegetables their child consumes each day. The program by Wright et al. (2012) was the only other program to show a statistically significant increase in consumption of both fruits and vegetables. Improvement was also seen in the number of times the family eats dinner together at the table. The medians of the other behaviors measured by this questionnaire remained the same. When comparing these results to the 5-2-1-0 message, it reveals that the families indicated they were already meeting three of the standards of the initiative. Children were already limiting screen time to two hours per day, limiting juice, and participating in one hour of physical activity. This is an interesting finding based on the parents’ responses to the HPM questionnaires. They gave the impression with their open-ended answers that their children were not engaging in enough physical activity and they were participating in too many sedentary activities.

Health Promotion Model

Prior to the program, a registered nurse contacted the families to discuss with them prior behaviors and behavior-specific cognitions and affect as discussed in the HPM. After the program, the families were again contacted to discuss any competing demands and preferences they had throughout the program. Two forms from Pender (2011) were used as a guideline. One was focused on healthy eating and the other physical activity. The goal for obtaining these data was to understand any prior attempts the families have made at achieving these behaviors, what went well and poorly with these attempts, and what factors in their lives may affect their ability to be successful in achieving the health promoting behavior. These questionnaires were not
completed soon enough to tailor the program to fit the participants’ needs; however, some very useful information was gained. When looking at the overall responses to these questions, it seems that families perceive they have a good self-efficacy, have good role models, have places where they can eat healthy and be physically active, and were ready to commit to the plan of action. At follow-up, a majority of the families stated they did not encounter any competing demands and felt they were doing very well. This perception contradicts the findings from the behavior questionnaires. Families felt they were doing great, yet, they made very little progress in improving their behaviors. One way to have determined if families actually made progress or if they only perceived they made progress is having families keep logs of dietary intake and physical activity and comparing them before and after the program rather than relying on perception.

Participant Feedback

Through discussions with the families and a satisfaction survey of the program, families provided feedback about the program. Overall, they felt it was a great program. They enjoyed the physical activities and felt that all of the lessons were helpful. The respondents stated they were very satisfied with the program and would highly recommend it to other families. Recommendations the families had to improve the program were having it earlier in the year, and separating the adolescents from the school-aged children.

Summary of Results

As discussed in chapter 3, the goal of the HPM is to achieve a health promoting behavior. This is accomplished by implementing an intervention that modifies the six behavior-specific variables: perceived benefits, perceived barriers, perceived self-efficacy, activity-related affects, interpersonal influences, and situation influences (Pender et al., 2011). Each of these variables
was tied into this dissertation project in chapter 4. The results from this project indicate that the families are making progress towards health promoting behaviors. Even though it may not have been fully achieved by the end of this B. Healthy Families program, families seem to have committed to a plan of action and are actively working towards their goal.

**Strengths**

There are a few strengths to this project that need to be highlighted. First is the design and components of the program. Experts stated the best childhood obesity program involves the entire family, takes place in a community setting, and incorporates lessons on nutrition, physical activity, and behavior modification (ADA, 2006; National Institutes of Health, 2008; Pratt et al., 2008). The B. Healthy Families program incorporated all of these recommendations. The inclusion of parents in the program should be highlighted. As discussed in chapter 2, parents highly influence the health behaviors of children. Involving parents in this program provided support to the children. The program encouraged parents to provide healthy food to their children and encouraged them to participate in physical activity as a family. According to Pender (2011) this is important because individuals are more likely to commit to health-promoting behaviors when they have individuals to model the behavior, expect the behavior to occur, and provide assistance and support to enable the behavior.

Another strength of this project was the location. The program was held at a YMCA facility. The YMCA strives to improve the nation’s health and well-being by ensuring that all children and adolescents have the opportunity to become healthier (YMCA, 2015).
Having the program at a facility that values and embraces the purpose of the program helps provide a positive environment. Pender et al. (2011) stated that individuals perform more competently in an environment in which they feel compatible, related, safe, and reassured and one that has cues that trigger action.

Finally, this project was theory-driven. According to Moran et al. (2014), nursing theory can help the DNP student recognize health patterns within a population, recognize health-related events that impact this population, and helps with the development of an intervention. The HPM was used as a supporting framework for this project. It allowed for a better understanding of the participants’ personal and situational factors that may have affected their success and provided a focus for the intervention.

**Limitations**

There are several limitations to this project. First, is the small number of participants. Only 16 children and 12 families participated. Of this number, only five families responded to both the pre and post questionnaires. This small sample size limits the findings. As sample sizes increase, the results have a greater chance of representing the entire population and improve the generalizability (Polit & Beck, 2012). The small sample size also raises the question of whether or not those participating represent all families in the target county.

A second limitation is the length of the program. When compared to four of the studies in the literature review (Chomitz et al., 2010; Joosse et al., 2008; Schwartz et al., 2012; Weaver et al., 2014), the B.Healthy Families program was shorter in length and ended with less significant results. Because all of the programs had similar components this indicates that length may be a factor. However, an evaluation of childhood obesity programs by Hadley, Hair, and Dreisbach (2010) found that “program length did not reveal consistent success patterns” (p. 5).
A third limitation is all the children that participated in the program were obese. The purpose of this project was not to target obese children, but to involve families who were in need of and interested in education on healthy eating, physical activity, and behavior modification. The involvement of obese children limits the generalizability of this program. Despite this, the focus of the program remained consistent and that was to promote healthy behaviors that will help prevent obesity and its health consequences.

A fourth limitation was the lack of specific recruitment criteria. As described in chapter 4, families were recruited by several different health care providers in the community. Health care providers were given a brief description of the program and asked to recruit families they felt would be interested in and benefit from the program. More specific criteria may have allowed for a wider variety of children enrolled in the program.

Another limitation is the questionnaires were not completed in a controlled setting. This may have resulted in discussions among participants about the answers. Next, post-intervention data was only collected once, immediately after the program. As seen in the studies presented in the literature review, data were often collected at several different time-points up to 12 months after the program. This would provide a better understanding of the long-term effects of the program. The knowledge questionnaires were created specifically for this project. They were not tested for reliability or validity. The participants scored very well prior to the program, which may indicate the questionnaires were too easy for this population.

The last limitation was the timing of the program. The program started mid-October and ended the week prior to Thanksgiving. This caused barriers to participation due to inclement weather on the day of the last session. Also, with the class ending so close to the holidays, families may have found it difficult to find the time to attend the program.
Sustainability

Sustainability of this project would require funds and a champion to organize, lead, and promote the program. There is still sufficient grant money that was awarded to fund this project to cover the costs of running the program another time. However, after this, the coalition would need to find other means of funding such as another grant or partnering with community organizations. Leading this program requires a large time commitment. The coalition has other priorities that must be addressed. In addition, the coalition does not have a large body of members. Therefore, the coalition may need to partner with another organization that can act as the champion for this program. One suggestion is the YMCA. This program is on target with their goals for the community. The YMCA offers many different camps to children and their families to encourage healthy living. One way they could promote the program is as a B.Healthy Families Camp. Sustainability of this program will also depend on community awareness. Making the community aware of the program and participant satisfaction will increase interest in the program.

Implications for the Future

After evaluating this program, there are several suggestions for future sessions of this program. First is incorporating a larger sample. This will allow for more quality results (Polit & Beck, 2012). Next, it is suggested that families keep a nutrition and physical activity log. Keeping logs will give the program leaders more insight on the participants’ behaviors rather than relying solely on their perception. It is highly recommended that future classes have a greater emphasis on goal setting and reviewing these goals with the families each week.
The families can discuss what went good and bad about reaching their goal that week and share ideas with one another. According to Bandura (1977) this would be one way to increase self-efficacy because the families would be engaging in vicarious experiences and performance accomplishments.

Another suggestion is focusing more on behavior modification. The families did well on the knowledge questionnaires and seem to understand what they are supposed to be doing. A greater focus on behavior modification will help them take this knowledge and put it into action. This need is supported by Hesketh, Waters, Green, Salmon, and Williams (2005). They found that parents were aware that their family’s nutrition and physical activity behaviors were not healthy, however, despite this awareness they were not making any changes. It would be helpful to talk with these families about why they are not making changes and help them overcome these barriers.

The families mentioned wanting the older and younger children separated. One way this could be accomplished is having breakout sessions where the younger children, older children, and parents could all break up into three groups to have more in depth conversations about the week’s topics. This will allow time for the presenters to make sure the younger children understand the content and expand content if needed for the older children and adults.

It is recommended that the program is extended beyond six weeks. This is something suggested by the families participating in the program. As previously mentioned, research is unclear about the ideal length of a program (Hadley et al., 2010), but those similar programs reviewed in this dissertation were longer in length and seemed to be more effective. Continued engagement with the families over time may improve their adherence to the lessons learned in the program.
For example, creating a Facebook page where the families can connect and continue to support one another or sending out flyers to families about upcoming activities in the community related to health and wellness and encouraging their attendance. This would be done to keep them engaged and focused on their goal of healthy living.

Future projects should focus on behavior modification and perception versus actuality. Understanding parental perceptions about healthy behaviors could help professionals understand the educational need of these families (Pocock, Trivedi, Wills, Bunn, & Magnusson, 2009). It will provide individuals with the knowledge needed to create programs that are effective. Results from this project reflect that families do have some knowledge about nutrition and physical activity but they are not putting this knowledge into action. It will be important to find out why this is, so the program can be tailored to address these needs.

Roles of the Doctorally-Prepared Advance Practice Nurse

The purpose of the DNP degree is to provide advanced practice registered nurses’ with additional preparation to obtain the tools and knowledge needed to become clinicians, leaders, advocates, scholars, innovators, and educators (Chism, 2010). To achieve these roles, there are eight essential foci that guide DNP students (American Association of Colleges of Nursing [AACN], 2006). These essentials are displayed in Table 7.
Table 7

*Doctor of Nursing Practice Essentials*

<table>
<thead>
<tr>
<th></th>
<th>Doctor of Nursing Practice Essentials</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Scientific Underpinnings for Practice</td>
</tr>
<tr>
<td>II</td>
<td>Organizational and Systems Leadership for Quality Improvement and Systems Thinking</td>
</tr>
<tr>
<td>III</td>
<td>Clinical Scholarship and Analytical Methods for Evidence-Based Practice</td>
</tr>
<tr>
<td>IV</td>
<td>Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health care.</td>
</tr>
<tr>
<td>V</td>
<td>Health Care Policy for Advocacy in Health Care</td>
</tr>
<tr>
<td>VI</td>
<td>Interprofessional Collaboration for Improving Patient and Population Health Outcomes</td>
</tr>
<tr>
<td>VII</td>
<td>Clinical Prevention and Population Health for Improving the Nation’s Health</td>
</tr>
<tr>
<td>VII</td>
<td>Advanced Nursing Practice</td>
</tr>
</tbody>
</table>

Although DNP students must be competent in each of these eight essentials prior to graduation, not all of the essentials are addressed in the scholarly project (Moran et al., 2014). For this scholarly project, essentials I, II, III, IV, VI, VII, and VIII were demonstrated.

Essential I was the starting point of the project. This began at the beginning of the DNP program when the student began exploring the phenomenon of childhood obesity. As described by the AACN (2006), the significance of childhood obesity was explored and actions and strategies to ameliorate this phenomenon were evaluated. When developing this project, knowledge was taken from nursing theories, specifically the HPM. Essential II was demonstrated by creating a program that focused on the needs of the community, working within an
organization to develop and implement the project, and monitoring the budget (AACN). The process of appraising existing literature, designing the program based the evidence, and analyzing the data is evidence of Essential III (Moran et al., 2014). Text messages and emails were sent to the families each week to remind them of the classes. This is a demonstration of Essential IV. The project required the DNP student to collaborate with other health care professionals and use leadership skills when doing so, which is a demonstration of Essential VI (AACN). The purpose of this project was to implement an intervention that addressed the public health issue of childhood obesity. The development, implementation, and evaluation of the intervention meets the requirements of Essential VII. Last, Essential VIII was accomplished through the DNP student’s partnership with the families and other professionals to facilitate patient outcomes, the implementation of an evidence-based program to improve patient outcomes, and educating and guiding the families through their transition to better health (AACN).

**Conclusion**

Childhood obesity is a significant problem in our nation. Programs such as the B. Healthy Families program are needed to provide education to families about nutrition, physical activity, and behavior modification. Only one behavior showed statistically significant results, but families did begin to make improvements in other areas. They enjoyed the program and feel this is something that should be offered to other families in the community. There were definitely several strengths to this program; however, there were also some limitations. Suggestions were made on how to improve the program for greater success in the future. It will be important for this community to continuing improving this program so they can make a positive impact on the prevention of childhood obesity among families in their area.
APPENDICES
Shared Medical Consent Form and Waiver

Privacy is a shared concern by everyone who participates in a shared medical visit. You as well as all of our patients have the right to expect that what you say during a shared visit will remain private and confidential. Normally, the information that you discuss during an individual appointment is protected by the patient-physician relationship. However, this confidentiality privilege is lost when you discuss the same information in a group setting. By signing this consent form, you agree that the B. Healthy Families shall not be considered liable for any financial or other damages resulting from any breach of confidentiality committed by other participants in the shared medical appointment. Additionally, you agree to respect and protect the privacy of other members participating in the B. Healthy Families visits.

By signing this authorization you are also giving us permission to obtain your child's growth charts from their primary care physician for a period of two (2) years. This information will be used to evaluate the effectiveness of the B. Healthy Families program. No personally identifying information will be used in the evaluation process.

Name of Patient: ___________________________  Birth Date: ____________

Parent or Guardian Signature: _________________  Date: ______________

In addition we will be taking photos and videos for training and educational purposes. We may also receive requests from local media for pictures of you and your child participating if B. Healthy Families activities. We would also like your permission to use your picture and your child's picture in future brochures.

Circle One:

Yes  I give my permission to use my and my child's photo in the above manner.

No  I do not give my permission to use my and my child's photo in the above manner.

Parent or Guardian Signature: _________________  Date: ______________
Weekly Family Goals

Instructions: Write down a healthy goal that your family would like to try over the next week.

Week 1:

______________________________________________________________________
______________________________________________________________________

Week 2:

______________________________________________________________________
______________________________________________________________________

Week 3:

______________________________________________________________________
______________________________________________________________________

Week 4:

______________________________________________________________________
______________________________________________________________________

Week 5:

______________________________________________________________________
______________________________________________________________________

Week 6:

______________________________________________________________________
______________________________________________________________________
### Weekly Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Behavior</th>
<th>Nutrition</th>
<th>Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Setting Goals</td>
<td>8-7-6-5-4-3-2-1 Lesson</td>
<td>Jump Rope</td>
</tr>
<tr>
<td>(October 13&lt;sup&gt;th&lt;/sup&gt;)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Emotions</td>
<td>Food labels and Serving Sizes</td>
<td>Exercise Stations</td>
</tr>
<tr>
<td>(October 20&lt;sup&gt;th&lt;/sup&gt;)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bullying</td>
<td>MyPlate and Beverages</td>
<td>Dance Video</td>
</tr>
<tr>
<td>(October 27&lt;sup&gt;th&lt;/sup&gt;)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Positive Thoughts and Self Esteem</td>
<td>Meal Planning. Breakfast and Snacks.</td>
<td>Fun with Balls</td>
</tr>
<tr>
<td>(November 3&lt;sup&gt;rd&lt;/sup&gt;)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Sleep, Stress Management, and Physical Activity.</td>
<td>Eating out and School lunches: How to Make Healthy Choices</td>
<td>Jump Rope</td>
</tr>
<tr>
<td>(November 10&lt;sup&gt;th&lt;/sup&gt;)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Balance and Recap of the Program.</td>
<td>Grocery Tips</td>
<td>Exercise Stations</td>
</tr>
<tr>
<td>(November 17&lt;sup&gt;th&lt;/sup&gt;)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
APPENDIX D
What’s your Activity IQ?

Instructions: Please circle the correct answer to the following questions.

1. A good activity to strengthen leg muscles is:
   a. Stretching
   b. Push-ups
   c. Squats
   d. Pull-ups

2. What is the maximum amount of time your child should spend watching TV, playing video games and using the computer each day?
   a. 1 hour
   b. 2 hours
   c. 3 hours
   d. 4 hours

3. Which activity is better for your child’s health?
   a. Cleaning the House
   b. Watching TV
   c. Playing Video Games
   d. Play on the Computer

4. What is the minimum amount of time your child should spend doing physical activity each day?
   a. 30 minutes
   b. 90 minutes
   c. 20 minutes
   d. 60 minutes

5. A good activity to strengthen arm muscles is:
   a. Playing soccer
   b. Push-ups
   c. Running
   d. Stretching

6. Which activity is good for your child’s heart?
   a. Squats
   b. Jogging
   c. Playing video games
   d. Lifting weights
What’s your Nutrition IQ?

Instructions: Please circle one of the two foods you think is better for your child’s health.

1. Frozen Yogurt   Ice Cream
2. French Fries   Baked Potato
3. Low Fat or Skim Milk   Regular Milk
4. Doughnut   Toast
5. Apple   Candy Bar
6. Water   Juice

Instructions: Please circle the correct answer to the following questions.

1. How many servings of fruits and vegetables should your child consume each day?
   a. Three
   b. Four
   c. Five
   d. Six

2. How many servings of dairy should your child consume each day?
   a. One
   b. Two
   c. Three
   d. Four

3. What is a balanced diet?
   a. Eating lots of fruits and vegetables
   b. Eating the same foods everyday
   c. Eating the exact same amount of food from each food group
   d. Eating different foods from all the food groups

4. Which of the following is a healthy snack for your child?
   a. Potato Chips with Dip
   b. Popcorn with Salt & Butter
   c. Whole-Wheat Crackers and Cheese
   d. Cookies and Milk
What’s your Activity IQ?

Instructions: Circle the picture that you think is the correct answer.

1. A good activity to strengthen your leg muscles is:
   - Squats
   - Stretching

2. What is the maximum amount of time you should spend watching TV, playing video games and using the computer each day?
   - 2 HOURS
   - 4 HOURS

3. Which activity is better for your health?
   - Playing Video Games
   - Cleaning the House

4. How much total time should you spend each day doing physical activity?
   - 30 Minutes
   - 60 Minutes
5. A good activity to strengthen your arm muscles is:

- Soccer
- Push-ups

6. Which activity is good for your heart?

- Lifting Weights
- Running

7. Which activity is better for your health?

- Watching TV
- Playing Ball
What’s your Nutrition IQ?

Instructions: Circle **one** of the two foods that you think is better for your health.

1. Frozen Yogurt  
2. French Fries  
3. Low Fat or Skim Milk  

Ice Cream  
Baked Potato  
Regular Milk
4. Doughnut

5. Chips

6. Apple

7. Water
**Family Nutrition & Physical Activity**

THE FNPA TOOL IS DESIGNED TO ALLOW YOU TO EVALUATE YOUR HOME ENVIRONMENT AND PARENTING PRACTICES RELATED TO YOUR CHILD’S RISK FOR OVERWEIGHT AND OBESITY.

**FOR EACH QUESTION, PLEASE SELECT THE ANSWER THAT BEST REPRESENTS YOUR CHILD/FAMILY**

<table>
<thead>
<tr>
<th>Question</th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Usually</th>
<th>Almost Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My child eats breakfast...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Our family eats meals together...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Our family eats while watching TV...</td>
<td></td>
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<td></td>
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<tr>
<td>4. Our family eats fast food...</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5. Our family uses microwave or ready to eat foods...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. My child eats fruits and vegetables at meals or snacks...</td>
<td></td>
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</tr>
<tr>
<td>7. My child drinks soda pop or sugar drinks...</td>
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<td></td>
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<tr>
<td>8. My child drinks low fat milk at meals or snacks...</td>
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<tr>
<td>9. Our family limits eating of chips, cookies, and candy...</td>
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<tr>
<td>10. Our family uses candy as a reward for good behavior...</td>
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<td></td>
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<tr>
<td>11. My child spends less than 2 hours on TV/games/computer per day</td>
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<tr>
<td>12. Our family limits the amount of TV our child watches...</td>
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<tr>
<td>13. Our family allows our child to watch TV in their bedroom...</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>14. Our family provides opportunities for physical activity</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>15. Our family encourages our child to be active every day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Our family finds ways to be physically active together...</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>17. My child does physical activity during his/her free time...</td>
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<tr>
<td>18. My child is enrolled in sports or activities with a coach or leader</td>
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<tr>
<td>19. Our family has a daily routine for our child’s bedtime...</td>
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<td></td>
<td></td>
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<tr>
<td>20. My child gets 9 hours of sleep a night...</td>
<td></td>
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</tbody>
</table>

**Scoring:** Add up scores for each scale (items should be scored 1, 2, 3, 4 from left to right except for items that are reverse coded (3, 4, 5, 7, 10, and 13). These should be scored 4, 3, 2, 1 from left to right. See Back for Feedback.

<table>
<thead>
<tr>
<th>Family Meal Patterns</th>
<th>Item 1 + Item 2 =</th>
<th>Item 3 + Item 4 =</th>
<th>Item 5 + Item 6 =</th>
<th>Item 7 + Item 8 =</th>
<th>Item 9 + Item 10 =</th>
<th>Item 11 + Item 12 =</th>
<th>Item 13 + Item 14 =</th>
<th>Item 15 + Item 16 =</th>
<th>Item 17 + Item 18 =</th>
<th>Item 19 + Item 20 =</th>
<th>Total Score</th>
</tr>
</thead>
</table>

The FNPA Tool was developed at Iowa State University by Michelle Ihmels (mihmels@iastate.edu) and Greg Weik (gweik@iastate.edu) in partnership with the American Dietetic Association.
Health Promotion Model
Clinical Assessment for Health Promotion Plan

Increasing Physical Activity

Assess current stage of physical activity [pre-contemplation (PC), contemplation (C), planning/preparation (P), action (A), maintenance (M)]. If in stages C, P, or A, continue. If in stage M, reinforce positive behavior. If in stage PC, reinforce benefits of physical activity, and assess readiness at a later time.

Prior Behavior
What attempts have you made in the past to be physically active?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

What did you learn from these experiences?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Personal Influences

What are the personal benefits of becoming more active?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

What problems (barriers) might you have trying to be more active?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

How sure are you (self-efficacy) that you can overcome these barriers to being more active?

1    2    3    4    5    6    7    8    9    10
Uncertain     Very Sure

What physical activities do you enjoy most? (activity-related affect)
____________________________________________________________________
**Interpersonal Influences**

**Social Norms** - Do any of your family members or friends expect you to be physically active? Yes No
If so, who? __________________________________________________________

**Social Support** - Who will encourage you to be active or be active with you?
______________________________________________________________

**Role Models** - Is anyone in your family or any of your friends physically active 3-5 times every week? Yes No
If so, who, and what do they do?
______________________________________________________________

**Situational Influences**

Where could you be physically active doing what you enjoy?
______________________________________________________________

**Commitment to a Plan of Action**

Are you ready to set goals and develop a plan to become more active? Yes No
Steps of Plan
______________________________________________________________

______________________________________________________________

**Competing Demands and Preferences (At Follow-up)**

What problems did you encounter in trying to be more active?
______________________________________________________________

______________________________________________________________

How can you avoid these problems in the future?
______________________________________________________________
Health Promotion Model
Clinical Assessment for Health Promotion Plan

Improving Nutrition
Assess current stage of positive nutrition practices [pre-contemplation (PC), contemplation (C), planning/preparation (P), action (A), maintenance (M)]. If in stages C, P, or A, continue. If in stage M, reinforce positive behavior. If in stage PC, reinforce benefits of positive nutritional practices, and assess readiness at a later time.

Prior Behavior
What attempts have you made in the past to eat healthy foods at work and at home?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
What did you learn from these attempts?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Personal Influences
What are the personal benefits of improving your eating habits?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
What problems (barriers) might you have trying to eat healthier foods (more vegetables, more fruits, lower fat foods, and healthy grains)?
____________________________________________________________________
____________________________________________________________________

How sure are you (self-efficacy) that you can overcome these barriers to eating healthy?
1          2          3          4          5          6          7          8          9          10
Uncertain                                                                                                Very Sure

What healthy foods do you enjoy most? (activity-related affect)
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
Interpersonal Influences

**Social Norms** - Do any of your family members or friends expect you to eat healthy foods? Yes No
If so, who, and what do they do?

- ________________________________________________________________________

**Social Support** - Who will encourage you to eat healthy meals and eat them with you?

- ________________________________________________________________________

**Role Models** - Do any of your family members or friends eat healthy meals most of the time? Yes No
If so, who?

- ________________________________________________________________________
- ________________________________________________________________________
- ________________________________________________________________________

What do they eat?

- ________________________________________________________________________
- ________________________________________________________________________
- ________________________________________________________________________

Situational Influences

Where can you find healthy foods to eat that you enjoy?
Work? _________________________________________________________________
Home? _________________________________________________________________
Other? _________________________________________________________________

Commitment to a Plan of Action

Are you ready to set goals and develop a plan to eat healthier meals? Yes No
Steps of Plan for Healthy Eating

- ________________________________________________________________________
- ________________________________________________________________________
- ________________________________________________________________________

Competing Demands and Preferences (At Follow-up)
What problems did you encounter in trying to eat healthier foods?

- ________________________________________________________________________
- ________________________________________________________________________
- ________________________________________________________________________

How can you avoid these problems in the future?

- ________________________________________________________________________
- ________________________________________________________________________
- ________________________________________________________________________
Appendix G
Hello,
My name is Katelyn Bailey and I am a Doctor of Nursing Practice Student from Grand Valley State University. For my dissertation project, I implemented a childhood obesity program in a rural community that focused on the family. This was not a research project; however, I did collect data to measure outcomes. I used your FNPA screening tool, which is excellent. I would love to add the tool as an appendix in my dissertation and wondered if I could have written permission to do so?

Thank you so much.

Katelyn Bailey

---

Hi Katelyn

Sure. Feel free to include it. We have a user group set up at [www.myfnpa.org](http://www.myfnpa.org) if you want to look at that. Thanks.

Greg Welk

---

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Email: gwelk@iastate.edu
Webpage: [www.physicalactivitylab.org](http://www.physicalactivitylab.org)
References


