MARATHONERS: A CHILDHOOD OBESITY PREVENTION PROGRAM

by

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ABSTRACT

Childhood obesity is a globally growing epidemic, at least 20 million children world wide under the age of 5 years were overweight in 2005. The widespread obesity trend is a problem with significant medical, psychosocial and economic consequences. If this trend continues as it has the average youth of today will be living less healthy and ultimately shorter lives than their parents.

The purpose of this project is to first, describe the significance of the current childhood obesity epidemic and explore the physical, environmental and societal factors that play a pivotal role in putting children at risk. Obesity interventions and gaps in obesity prevention programs will be reviewed, selected theories and models of behavior change will be discussed, and knowledge deficits among parents and children will be identified. Second, this paper will describe a unique after-school intervention program designed by the author called Marathoners, which aims to decrease childhood obesity long-term by combining aspects and concepts of behavior change in a way that has not been used in an intervention before. By combining these concepts there may be a decrease in the types of problems other programs are having; no long-term change.
CHAPTER ONE

Introduction

Childhood obesity is a growing epidemic in the United States and nations such as Canada, Australia, China and Japan. Globally, at least 20 million children world wide under the age of 5 years were overweight in 2005 (WHO, 2006). *Healthy People 2010*, a public health initiative in the United States, identified being overweight and obesity among the leading significant health problems in this country, and called for a reduction in the proportion of children and adolescents who are overweight or obese (U.S. Department of Health, 2001). Unfortunately, the United States has made little progress toward the target goal. Overweight and obesity are both labels for ranges of weight that are greater than what is generally considered healthy for a given height in both children and adults. Being overweight is considered being 25-30 pounds over the recommended weight for the person's height and being obese is considered anything over 30 pounds or more above the recommended weight for their height (WHO, 2006). Data from the National Health and Nutrition Examination Survey (NHANES) 2003–2004 showed that for children in the U.S, aged 6 –11 and 12–19 years, the prevalence of those overweight was 18.8% and 17.4% respectively. Obesity is but one of the time “bombs” that will affect the health and longevity of youth today. The consequences of obesity can take many years to develop, and can lead to a life time of health problems and increased costs (Moore, 2004).
Problem Statement

In the study, “Changing the Perception of the Childhood Obesity Epidemic”, the researchers confirm that 47% of Americans perceive that overweight and obese children are a very serious problem (Evans et al., 2006). Consequently, public support for specific childhood interventions has been observed. In this public survey, 80% of participants agreed that schools should make weight loss and exercise interventions available (Evans et al.). The researchers also found that 53% of parents agreed that schools should prohibit the advertising of fast foods and unhealthy foods that are marketed to children. This study suggests that there is strong and growing support for approaches aimed at weight loss and obesity among children and adolescents.

Growing support for after school programs has increased the number of interventions and the diversity of approaches being provided for nutrition education and physical activity. Many programs focus on physical activity, some focus on teaching appropriate eating habits, most do not include parental involvement and only a small portion of the programs are designed to address the multifactorial factors that affect obesity (Afterschool Alliance, 2004). Funding has increased for after school programs as well; in California, LA’s BEST has grown from 10 sites in 1988 to 130 elementary school sites serving more than 21,000 students (Goldschmidt, Huang & Chinen, 2004). Despite this growth of after school programs, the availability of these are falling far short of the demands for them from children and their parents (Afterschool Alliance), and the mission to prevent and contain the childhood obesity epidemic. In a notable meta-analysis of 39 clinic-based outcome studies the researchers concluded that the majority of pediatric
obesity programs yield some short term benefits but none have had significant impact (Goldfield, Raynor & Epstein, 2002). Even though there are more programs available and more funding is being provided, there is still no significant headway being made in the fight against childhood obesity. With the extra funds being provided, a new unique intervention needs to be put in to action that will affect childhood obesity for the long-term.

The purpose of this paper is to first, describe the significance of the current childhood obesity epidemic and explore the physical, environmental and societal factors that play a pivotal role in putting children at risk. Obesity interventions and gaps in obesity prevention programs will be reviewed, selected theories and models of behavior change will be discussed, and knowledge deficits among parents and children will be identified. Second, this paper will describe a new after school intervention program designed by the author called Marathoners, which aims to decrease childhood obesity long-term by combining aspects and concepts of behavior change in a way that has not been used in an intervention before. By combining these concepts there may be a decrease in the types of problems other programs are having; no long-term change.

Background and Significance

Obesity is a widespread and growing worldwide problem with significant medical, psychosocial and economic consequences (Bray & Bouchard, 2004). The prevalence of obesity has increased substantially over the last few decades and indications are that this trend will continue (Bray & Bouchard). With this trend of increasing prevalence and severity of childhood obesity, a question has been raised; will
the trend reverse the modern era’s steadily increasing life expectancy? (Daniels 2006)

With the average youth of today living less healthy and ultimately shorter lives than their parents, will this be the first such reversal in lifespan in modern history? For both adults and children, obesity and overweight pose a major risk for developing chronic diseases such as type 2 diabetes, cardiovascular diseases, hypertension and certain forms of cancers (WHO, 2008). Overweight and obesity are an abnormal or excessive fat accumulation that may impair health, but the degree of fat accumulation is what distinguishes the two terms (WHO).

*Weight Status Measurement Tools*

One way for classifying overweight status and obesity is using a person’s body mass index (BMI), a simple measure of weight-for-height that is commonly used (Nishida, 2004). BMI is as the weight in kilograms divided by the square of the height in meters (kg/m2). Nishida argues that BMI provides the most useful measure of being overweight and obese for both sexes and for all ages of adults. However, it is considered as a rough guide because it may not correspond to the same degree of “fatness” in different individuals because BMI does not take into consideration the percentage of body fat. (Nishida, 2004). According to WHO (2006) a BMI score in those who are older than 14 years of age of equal to or more that 25 is considered overweight, and a BMI equal to or more than 30 is considered obese. These cut-off points can provide benchmarks for individual assessment. Children with a BMI at or above the 95th percentile on the Center for Disease control growth chart are categorized as obese or overweight, while children with a BMI between the 85th and 95th percentile are at risk.
Currently, there are growth charts for infants and young children up to age 5, but there are no charts for those from age 5-14. BMI changes so frequently with growth and due to individualized differences in maturation and growth, it makes measuring the overweight status in children 5 to 14 challenging. There is no standard definition of childhood obesity applied worldwide (WHO, 2006). WHO is currently developing an international growth reference for school-age children and adolescents to make it easier for health care professionals to identify at risk and overweight children. Due to recent reviews of scientific literature there is evidence that suggests that different populations such as Asian or Pacific have different associations between BMI, percentage of body fat, and health risks than do European populations (Nishida). Asian populations have a lower percentage of body fat at a given BMI than do white or European populations, but they may be at increased risk for health consequences associated with high BMI at a lower cut off point (Nishida).

Another tool that has been used to measure obesity and increased risk of obesity complications is the waist-to-hip ratio (WHR). The WHR has been used extensively in adults; however, studies published in the 1990s suggest that WHR may be a more useful and accurate tool in children than BMI (Goran, Gower, Treuth & Nagy, 1998). It has been well established that a high WHR is linked with more central fat distribution and associated with an increased risk of ill health patterns including of increased serum lipoprotein concentrations, increased blood pressure and increased rates of atherosclerosis (Raphael, Abdullah, McGuire, Khera, Patel, Lindsey, Grundy, & de- Lemos, 2007). A more recent study concluded that the use of ratios such as WHR to assess obesity in
children may not be appropriate because they are highly age dependent; obscure strong relations may be present with separate circumference measurements, and differences in skeletal structure may confound the results (Taylor, Jones, Williams, & Goulding, 2000). There is no perfect way to measure obesity status in children but the use of these tools and good judgment can help health care practitioners and those running intervention programs identify children at high risk earlier, gage progress, and encourage children with high waist circumferences and high BMIs to eat healthy diets and be more physically active.

**Childhood Obesity**

After an obese child reaches 6 years of age, the probability that obesity will persist into adulthood exceeds 50%, and 70%–80% of obese adolescents will remain so as adults (Segal & Sanchez, 2001). The presence of obesity in at least one parent increases the risk of persistence in children at every age. Styne (2005) determined that a history of being overweight in childhood that persists into adulthood is associated with more severe complications of obesity later in life. According to U.S. Centers for Disease Control and Prevention (CDC) (2004) data about 15 % of children and adolescents can be labeled as having childhood (pediatric) obesity in the U.S with the incidence steadily increasing. Concerns are raised about the health of these youth as they approach adulthood. Being overweight puts children and teenagers at greater risk for a number of serious health conditions. Fat tissue produces adipokines, including leptin, adiponectin, and resistin, in addition to other cytokines (eg, interleukin-6, tumor necrosis factor-α, plasminogen activator inhibitor-1) that are involved in inflammation (Daniels et al.,
2005). Therefore, the pathological consequences of an excessive increase in body fat are broad and involve a number of organ systems. There is extensive literature documenting the consequences of obesity in childhood, including cardiovascular, endocrine, respiratory, orthopedic, pulmonary, neurological, and psychosocial disorders (Zwaiuer, Caroli, Malecka-Tendera & Poskitt, 2002). Medical problems associated with overweight children include type 2 diabetes, hypertension, asthma and sleep apnea, and psychosocial effects such as decreased self-esteem (Flier, 2004).

**Cardiovascular Consequences**

In a study conducted in Korea, 60% of overweight 10 to 18-year-olds already had at least one risk factor for heart disease, and 26% had two or more risk factors for the disease including elevated blood pressure, total cholesterol, triglycerides and blood glucose levels. (Kim, Park, Ho-Seong, Duk & Sung, 2006). Likewise, found high levels of adiposity, systolic blood pressure and diastolic blood pressure and triglycerides were consistently higher from childhood through adulthood in both prehypertensive and hypertensive subjects versus normotensive subjects in a study related to metabolic syndrome in youth (Sathanur, Myers & Berenson, 2006). They concluded that excess adiposity and elevated blood pressure beginning in childhood accelerated adverse longitudinal changes in risk variables for metabolic syndrome through young adulthood characterizes the early natural history of hypertension (Sathanur, Myers & Berenson). Overweight and obese children have an increased risk of cardiovascular disease (CVD), including heart attack, congestive heart failure, sudden cardiac death, angina and abnormal heart rhythm (Daniels, 2006). Obesity predisposes children to hypertension...
because of its concomitant metabolic and hemodynamic abnormalities that lead to inadequate lowering of systemic resistance and leading to more severe cardiovascular burden (Chinali, et al., ). Obesity parallels early cardiac changes like increasing left ventricular hypertrophy, increase hemodynamic work load and suggest that increased left ventricular mass occurs to sustain workload due to excess weight (Chinali, et al.,).

Endocrine/Metabolic Changes

Research in endocrinology has shown that elevated levels of free fatty acids (acids released primarily by fat cells and used for energy within the body) in the bloodstream can cause insulin resistance, an abnormal production of triglycerides by the liver, and blood vessel responses that can lead to hypertension (Flier, 2004). Metabolic changes that occur lead to complications within the endocrine system. Obesity leads to excess of insulin production, which is associated with an increase in blood pressure and dyslipidemia. The effects of increased insulin resistance are multiple and include increased hepatic synthesis of very-low-density lipoprotein, resistance of the action of insulin on lipoprotein lipase in peripheral tissues, enhanced cholesterol synthesis, increased high-density lipoprotein degradation, increased sympathetic activity, proliferation of vascular smooth muscle cells, and increased formation and decreased reduction of plaque (Daniels et al.). One out of every five overweight adults and adolescents are affected by the metabolic syndrome, or “Syndrome X” (American Diabetes Association (ADA), 2006). The metabolic syndrome and type 2 diabetes are two of the fastest growing health concerns among both doctors and patients. Type 2 diabetes, formerly known as adult-onset diabetes, has been reported among U.S. children and
adolescents with increasing frequency (CDC, 2005). In 2005, about 150,000 young people under 18 years, or about one in every 400 to 500 had diabetes (CDC). Syndrome X is a disorder characterized by a cluster of health problems including obesity, high blood pressure, increased lipid levels all linked by underlying insulin resistance, the precursor to both metabolic syndrome and type 2 diabetes (ADA). Excessive dietary intake of refined sugar, lack of exercise, poorly defined genetic tendencies, and adverse lifestyles contribute variables to the pathogenesis of insulin resistance (ADA). Type 2 diabetes and metabolic syndrome are both health problems that can for the most part be prevented, especially in children if simple lifestyle changes are made.

Orthopedic Consequences

Increased body mass elevates the risk for orthopedic problems such as osteoarthritis due to increased physical stress put on bones and joints, especially is the bilateral knees of obese women (Stevenson, Weber & Smith, 2001). Because obese children carry excess weight, they can also have problems with tibial torsion and bowed legs, flat feet, slipped capital femoral epiphysis (especially in boys) and pain in joints of the lower extremities (Ludwid, 2007). Excessive abdominal girth can create back pain (Lemura & Duvillard, 2003).

Respiratory Consequences

Obese individuals are at risk for hypoventilation characterized by pCO2 on arterial blood gas measurement (Lemura & Duvillard, 2003). The increase abdominal girth of the chest wall and abdomen decrease compliance of the respiratory system, thereby altering the respiratory pattern (Lemura & Duvillard). Due to an increased
ventilation perfusion mismatch, they are predisposed to hypoxemia as well. The combination of hypoxemia and carbon dioxide retention in obese individuals is referred to as Pickwichians Syndrome (Lemura & Duvillard). The combination of a large neck girth and increased fat deposition in the soft palate and uvula, as well as in the neck area and pharynx, contributes to narrowing of the upper airway leading to obstructive sleep apnea (Schafer, Pauleit, & Sudhop, 2002). Obstructive sleep apnea is an emerging cardiovascular risk factor in children. Amin, et al. (2002) found that increased BMI was related to an increased risk of obstructive sleep apnea in children and adolescents. They also showed that obstructive sleep apnea was associated with increased left ventricular mass index in a pediatric population. Characteristics of sleep apnea include chronic fatigue, sluggishness, morning headache, hypertension, and increased pulmonary resistance (Lemura & Duvillard). Uncontrolled sleep apnea can lead to pulmonary hypertension, polycythemia, and cor pulmonale, which can predispose the child to sudden cardiac death for ventricular arrhythmias (Lemura & Duvillard).

Psychosocial Consequences

Among the most widely identified negative consequences for obese children are psychosocial problems. One study found that obese children and adolescents reported significant impairment in physical, psychosocial, emotional, social, and school functioning, which was 5.5 times greater than that of healthy children or adolescents (Schwimmer, Burwinkle, & Varni, 2003). Data from other studies show there are inconsistencies in results regarding prevalence and effects (Stradmeijer, Bosch, Koops, & Seidell, 2000; Zemetkin, et al., 2004). There are reports that obese children demonstrate
more negative cognitions of their self-perceptions, decreased self-worth, increased behavioral problems, lower self-esteem, and lower perceived cognitive ability (Stradmeijer et al., 2000; Davison & Birch, 2001; Reilly et al., 2003). In a cross sectional school-based survey of obese adolescents compared to non-overweight adolescents, Mellin, Neumark-Sztainer, & Story (2002) found that obese adolescents reported higher levels of emotional distress, more aggressive behaviors, sexual promiscuity, drug, alcohol and tobacco addictions, and rated future educational plans lower than non-overweight children. The development of overweight also may be related to subsequent psychosocial difficulties. The risk of psychosocial issues increases with the severity of obesity, being female and of minority status, negative parental and cultural responses to weight gain, and the obese child’s lack of protective of compensatory mechanisms (Daniels, 2006).

**HRQOL Consequences**

Recently, researchers have begun to document the impact of elevated BMI on health-related quality of life (HRQOL). HRQOL is a construct that attempts to provide a generalized assessment of well-being measured along multiple dimensions, including physical, functional, psychological, and social well-being (CDC, 1994) One study found serious adverse consequences of obesity on HRQOL in a clinical sample of severely obese (mean BMI: 34.7) children and adolescents 5 to 18 years of age (Schwimmer, Burwinkle,& Varni). Children who are at risk for or who are overweight are 2 to 4 times more likely to have lower HRQOL scores for psychosocial health, self-esteem, and physical functioning (Friedlander, Larkin, Rosen, Palermo, & Redline, 2003). Children who are overweight and obese are vulnerable to the consequences of bias, and also
targets of stigma or negative attitudes that affect interpersonal interactions and activities in a detrimental way. Attitudes towards obese youth develop at very young ages, and children attribute multiple negative characteristics to overweight peers including being mean, stupid, ugly, unhappy, lazy, and having few friends. Peers are common perpetrators of weight-related teasing and derogatory names. One of the primary mediators of the psychopathological relations with obesity is compromised peer relationships (Strauss & Pollack, 2003). According to Strauss & Pollack, overweight children have fewer friends and social networks, and appear to have more isolated peripheral relationships. They suggest that normal-weight children have more relationships with a central network of children. In addition to having fewer friends, being teased about weight is another important mediator of psychosocial distress. Bias and stigma have detrimental impacts on the emotional well-being in children. Research shows that children who are targets of weight stigma internalize pessimistic attitudes and engage in self-blame for the social experiences that they confront, and are more likely to be socially isolated (Ackard, Neumark-Sztainer, & Story, 2003). More alarming, there are recent studies demonstrating a positive association between teasing overweight youth and suicide youth (Eisenberg, Neumark-Sztainer & Story, 2003).

**Economic Consequences**

Overweight and obesity and their associated health problems have a significant economic impact on the U.S. health care system (USDHHS, 2001). Medical costs associated with overweight and obesity may involve direct and indirect costs (CDC, 2007). Direct medical costs include preventive, diagnostic, and treatment services related
to obesity. Indirect costs relate to morbidity and mortality costs. According to a study of national costs attributable medical expenditures related to overweight (BMI 25–29.9) or obesity (BMI greater than 30), reached $75 billion in 2003, and approximately one-half of these expenditures are financed by Medicare and Medicaid (Finkelstein, Fiebelkorn, & Wang, 2003). The national cost of childhood obesity alone is estimated at approximately $3 billion for those with Medicaid (NIH, 2004). Children covered by Medicaid are nearly six times more likely to be treated for a diagnosis of obesity than are children covered by private insurance (NIH, 2004).

Summary

Childhood obesity is a growing epidemic. It has been identified as a national health public initiative. There has been growing support among parents and teachers for the initiative to decrease childhood obesity, and more after school programs, however, little progress has been made. Although these interventions have helped to make short term changes, no real long term impact has been noted. Childhood obesity affects not on the child and the family, but the nation as a whole.
CHAPTER TWO

Introduction

The purpose of this chapter is to discuss extant models used to guide the Marathoners program as well as to identify the risk factors that are discussed in the literature. Identifying the risk factors for childhood obesity will help to inform the theoretical framework and selection of participants for the Marathoners program.

Controlling obesity in its simplest form is the ability to maintain an energy balance within the body. The human body continually maintains an energy balance between the amounts of energy consumed and the amount of energy expended in everyday life (Ochoa et al., 2007). When there is more energy consumed than expended, a positive balance is created and weight gain occurs. Chronic over-consumption of food and drink beyond energy expenditure causes fat accumulation in adipose tissue leading to obesity (Marti, Moreno-Aliaga, Hebebrand, & Martinez, 2004). Although maintaining balance sounds very simple, and easily reversible, obesity is a much more complex disorder, and interventions in children need to address this complexity in order for there to be any success in long term weight reduction. Most of the literature reviewed examines individual components and very little looks at the multiple factors that led to the obesity epidemic. An intervention to reduce obesity would be supported by a theoretical framework that encompasses health promotion, behavior, and concepts that motivate change. Some of the available literature on interventions identifies models and theory to guide the researcher’s work.

There is vast amount of research available that has identified risk factors for
childhood obesity. These findings provide support for the development of interventions to aid in the prevention and decline in the alarming number of obese children.

Understanding the risk factors that contribute to the childhood obesity will allow those who develop interventions to better understand the obese child population, identify areas in need of support and knowledge, and identify the populations most at risk that need the greatest attention.

Definition of Key Terms

The range of health education and health behavior change strategies today is almost limitless. The concept of health education has grown rapidly over the past two decades and is now recognized as a way to meet public health objectives such as *Health People 2010*, and as a way to improve the success of public health and medical interventions (Glanz, Rimer & Lewis, 2003). The science and art of approaches to health behavior change and health education are collective, rapidly evolving, and a reflective collaboration of approaches, methods and research from diverse disciplines such as psychology, sociology, anthropology, communications, nursing and marketing (Glanz et al.). Health education is strengthened by the collaboration of professionals and diverse disciplines because each is concerned about the behavioral and social intervention process and will bring unique perspective to solutions that will positively impact the problem. There are many definitions of health education but for this paper, health education is the process of assisting individuals by any combination of learning experiences, acting separately or collectively, to make informed decisions about matters affecting their personal health and that of others so they can achieve optimum health.
With these factors in mind, experts have recommended that interventions on social and behavioral factors related to health should link multiple levels of influence including the individual, interpersonal, institutional, community, and political (Smedley & Syme, 2000).

Another term that is closely related to health education is health promotion. While there are also many definitions of this term, Green and Kreuter (1991) definition will be used. These authors state that any synthesis of health education that is related to organizational, economic, and environmental supports for behavior of individuals, groups, or communities contributive to health. Although the terms health promotion emphasizes efforts to influence the broader social context of health behavior, health education and health promotion remain closely related and have been used interchangeably (Breckon, Harvey, & Lancaster, 1994). For this paper the terms health promotion and health education will be used separately. It is to be understood that health promotion is a varied set of strategies intended to influence both individuals and their social environments, to improve health behavior and to enhance health and quality of life (Glanz, Rimer, lewis, 2003).

The central component of health promotion is health behavior. In every definition of health education and health promotion this concept is included and is a crucial dependent variable in most research or intervention strategies (Gochman, 1997). Positive informed changes in health behavior are usually the ultimate aim of health education programs, and will be the aim for the Marathoner’s program proposed in this paper. For the purpose of this paper health behavior is defined as actions of individuals, groups and
organizations as well as their determinants, correlates, and consequences, including social change, and implementation, for improved coping skills, health improvement, and enhanced quality of life (Gochman).

Two terms that are not well defined in the literature of obesity are long term and short term weight loss or change. Wing and Hill (2001) proposed that successful weight loss maintainers be defined as "individuals who have intentionally lost at least 10% of their body weight and kept it off at least one year." Several aspects of this definition should be noted. First, the definition requires that the weight loss be intentional. Unintentional weight loss occurs quite frequently and may have different causes and consequences than intentional weight loss (Bouras, Lange, & Scolapio, 2001). Thus, it is important to include intentionality in the definition. The 10% criterion was suggested because weight losses of this magnitude can produce substantial improvements in risk factors for diabetes and heart disease (Wing & Hill). Although a 10% weight loss may not return an obese to a non-obese state, the health impact of a 10% weight loss is well documented to create positive change in hypertensive status, improved blood flow, and insulin function (National Hearth, Lung, and Blood Institute, 2000). Clearly the most successful individuals have maintained their weight loss longer than 1 year. Short term weight loss has been considered any weight loss that is maintained for less than a year and is then regained again or has not yet made the yearly mark. Currently, there are no specific criteria, guidelines, or definitions for them. Change has been defined by French & Bertram (2001) at a level of generality as alterations from a persons regular state overtime to behaviors, opinions, attitudes, goals, needs, values & all other aspects of a
person’s psychological field. For the purpose of the Marathoners program the author will use the terms long-term and short term change. Long term change is to be considered as any intentional positive alteration to a person’s attitude, opinion, goals, needs, or values toward physical activity, healthy eating or lifestyle choices, that is maintained for over a year. Short term change will be considered anything less than a year.

Theoretical Framework

The role of health promotion is both to understand health behavior and to convert the knowledge and behavior into effective strategies for health enhancement (Glanz, Rimer & Lewis, 2003). This understanding is best obtained through the relationship of theory, research, and practice, which occur in a cyclic pattern consisting of fundamental research, intervention research, surveillance research, application, and program delivery (National Center of Chronic Disease Prevention and Health Promotion, 2000). Being able to understand some of the most important theoretical underpinnings of health education, health behavior and this cyclic pattern allow health educators to clearly apply theory to program development, implementation, knowledge synthesis, and conceptually evaluating effectiveness. A theory does not have to be followed blindly like a cookbook recipe (Glanz, Rimer & Lewis); it should be tailored to shape to the circumstances of the target audience, setting, resources, goals and constraints (Prochaska, DiClemente, and Norcross, 1992). Health behavior and the paradigm of concepts influencing it are far too complex to be explained by a single, unified theory. In this case models are developed, generating a number of theories to help understand a specific problem in a particular setting or context.
In an analysis of twelve health journals in health education, health behavior, and preventative medicine during 1999-2000, Glanz, Lewis, & Rimer (2003) found ten theories or models emerging as the most used. The two dominant theories and models were Social Cognitive Theory and the Transtheoretical Model. Other theories and models were the Health Belief Model, Social Support and Social Networks, patient provider communication, the theory of Reasoned Action and the Theory of Planned Behavior, stress and coping, community organization, ecological models and Diffusion Theory (Glanz et al.). For the purposes of this paper the Social Cognitive, the Transtheoretical Model, and Pender’s Health Promotion Model will be described, as these models and theories will be used for the construction of the Marathoners program.

Social Cognitive Theory (SCT)

In 1941 Miller and Dollard proposed the theory of social learning. In 1963 Bandura and Walters broadened this theory of social learning with the principles of observational learning and vicarious reinforcement. Bandura eventually provided his concept of self-efficacy in 1977, which addresses both psychosocial dynamics influencing health behavior and the methods for promoting health behavioral change (Glanz, Rimer, & Lewis, 2003). According to Bandura (1977) evaluating behavioral change depends on the factors of environment, people and behavior. These three factors are not separate but instead constantly influencing one another. Behavior is not simply the result of the environment and the person, just as the environment is not simply the result of the person and behavior (Glanz et al.). The concept of behavior can be viewed in many ways. Bandura (1997) addresses the concept of behavioral capability, which means
in order for a person to perform a behavior he/she must know what the behavior is and have the skills to perform it (Glanz et al.). A strong influence on the behavioral capability is the concept of Self-efficacy, the person’s confidence or perception of he/she’s ability to be able to perform a particular behavior (Glanz et al.). It is best to approach behavioral change in small steps in hopes to decrease the overwhelming nature (negative feelings) of the task at hand and to ensure success. In attempting to change behavior Bandura recognized that each person elicits different emotional coping responses, but some responses may be destructive or not effective. Individuals' sense of self-efficacy is enhanced when they learn to associate positive feelings (or the absence of aversive physiological or affective arousal) with their new behavior. Emotional coping responses are the strategies or tactics that are used by a person to deal with emotional stimuli (Glanz et al.). When providing a health promotion intervention, it is best if the program incorporates training of appropriate problem solving and stress management tactics to ensure greater success (Bandura).

Bandura (1977) refers to the environment as the factors that can affect a person’s behavior including both social and physical environments. Social environment includes family members, friends and colleagues. Physical environment is the actual surroundings, ranging from the size of a room, including the temperature of that room to the availability of certain foods (Glantz et al., 2003). Environment and condition can provide the framework for understanding behavior. The situation refers to a person’s perception or cognitive representations of the environment that may affect behavior (Glanz et al.). The environment can provide models for behavior which can be seen in Bandura’s concept of
observational learning, which occurs when a person watches the actions of another person and the reinforcements that the person receives (Bandura, 1997). More credible role models of the targeted behavior are assumed to provide a better response (Glanz et al.). Reinforcements are described as responses to a person’s behavior that increase or decrease the likelihood of reoccurrence (Bandura, 1997).

In the area of health behavior change, interventions are being developed to assist individuals in their weight loss attempts by enhancing their sense of self-efficacy (Dallow & Anderson, 2003; Roach et al., 2003). For example, Roach et al. 2003 attempted to increase young adults' sense of self-efficacy for weight loss during a 12-week weight loss promotion program. These researchers concluded that their participants' self-efficacy improved, their eating habits improved and their health outcomes were more positive. A review of studies conducted by Byrne (2002) results uncovered that the level of self-efficacy has an important effect on the behaviors involved in weight maintenance and relapse in obesity. Finally, Pinto et al. (1999) discovered that self-efficacy improves for both eating and exercise behaviors when weight loss attempts are successful.

Some health educators have complained that the SCT is too complicated in its formulation. There are so many constructs that some authors have found a way to explain almost any phenomenon using one or more of the constructs (Glanz et al., 2003). Therefore, both practitioners and researchers using the SCT must specify the range of phenomena to which it applies, examine the situations in which the theory does not apply and limit their assertions about the utility of the SCT to those that are supported the experiential data (Glanz et al.).
The SCT explains how people acquire and maintain certain behavioral patterns. Evaluating behavioral change depends on the interaction among the environment, people and behavior. SCT provides a framework for designing, implementing and evaluating programs and is relevant to health promotion through design of health education and health behavior programs, and providing the basis for intervention strategies.

*The Transtheoretical Model and Stages of Change (TTM)*

The TTM was developed in 1979 and is currently one of the most popular stage models in health psychology (Horwath, 1999) and has proven successful with a wide variety of simple and complex health behaviors, including smoking cessation, weight control, sunscreen use, reduction of dietary fat, exercise acquisition, quitting cocaine, mammography screening, and condom use (Prochaska et al., 1994). Based on more than fifteen years of research and comparative analysis of theories in psychotherapy and behavior change, the TTM uses stages to integrate processes and principles of change (Glanz et al., 2003). The TTM illustrates that individuals progress through a series of six stages (precontemplation, contemplation, preparation, action, maintenance, termination) in the adoption of healthy behaviors or cessation of unhealthy ones (Prochaska & Velicer, 1997). These represent ordered categories along a continuum of motivational readiness to change a problem behavior.

Pre-Contemplation is the stage in which an individual has no intent to change behavior in the near future. Precontemplators are often characterized as resistant or unmotivated and tend to avoid information, discussion, or thought with regard to the targeted health behavior (Prochaska et al., 1992). In the Contemplation stage individuals
in this stage openly state their intent to change within the next 6 months. They are more aware of the benefits of changing, but remain keenly aware of the costs (Prochaska, et al.). Preparation is the stage in which individuals intend to take steps to change, usually within the next month (DiClemente et al., 1991). Preparation is viewed as a transitional rather than stable stage, with individuals intending progress (Grimley et al., 1994). The action stage is when an individual has made overt, perceptible lifestyle modifications for fewer than six months (Prochaska & Velicer, 1997). The Maintenance stage works to prevent relapse and consolidate gains secured during the action stage (Prochaska et al., 1992). Maintainers are distinguishable from those in the action stage because they report the highest levels of self-efficacy and are less frequently tempted to relapse (Prochaska & DiClemente, 1984). Termination is the stage in which individuals no longer give into temptation and have total self-efficacy no matter what the stressor (Glanz et al., 2003).

TTM research on a variety of different problem behaviors also has shown that there are certain predictors of progression through the stages of change (Prochaska & DiClemente, 1983), including decisional balance (Prochaska, 1994); self-efficacy (DiClemente, Prochaska, & Gibertini, 1985); and the processes of change (Prochaska & DiClemente, 1983). Decisional balance reflects the individual’s relative weighing of pros and cons of changing. The underlying assumption is that a person will not decide to change or continue in an activity unless he or she expects the pros to exceed the cons. Through research in multiple health behaviors, a systematic relationship has been found between the stages of change and the pros and cons (Prochaska et al., 1994). The research suggests that as the individual progresses from one stage to the next the pros get high and
the cons get lower (Prochaska et al). Therefore, when providing an intervention it may be best to place twice as much emphasis on raising the benefits than on reducing the cost and barriers (Glanz et al., 2003). The TTM integrate the concept of self-efficacy from Bandura’s (1977) and is thought of as situation specific confidence that people have that they can cope and overcome barriers in high risk situations without relapsing to their unhealthy behavior.

The stages of behavioral readiness are linked to behavior change within the TTM through activities used to modify behavior; these activities are known as “processes of change.” The series of ten processes of change is the manifested activities that people use to progress through the six stages including consciousness raising, dramatic relief, self-reevaluation, environmental reevaluation, self-liberation, helping relationships, counterconditioning, contingency management, stimulus control, and social liberation (Prochaska & Velicer, 1997). Movement through the stages is facilitated by different processes depending on the given stage (Prochaska, DiClemente, & Norcross, 1992). Procheska, DiClemente and Norcross suggest that in early stages people apply cognitive, affective and evaluative processes to progress, and in later stages rely more on commitments, conditioning, environmental controls, and support for progress. Therefore, it has been proposed that treatment is most effective when it is tailored to the particular stage of the individual.

The process of change does not follow a simple linear progression. Relapse is a common and expected occurrence in addiction recovery and behavior change. As a result, the stages are seen as a set of dynamically interacting components through which the
individual will likely cycle a number of times before achieving sustained behavior change (DiClemente et al., 1991). Even though an individual may regress to a former stage, he or she does not typically completely regress. The individual advances through the stages, making progress and losing ground, learning from mistakes made over time, and using those gains to move forward. However, the integration of the processes and stages has not been as consistent as the integration of the stages and pros and cons (Glanz et al., 2003). This may be due to the greater complexity of integrating ten processes of change across the six stages, suggesting the need for more basic research (Glanz et al.).

The final construct of the TTM providing the theoretical basis is social support. This concept is linked to behavior change and is defined as an interpersonal transaction involving emotional support (empathy, love, trust, and caring), instrumental support (tangible aid and service), informational support (advice, suggestions, and information), and appraisal support (information that is useful for self-evaluation) (Prochaska, DiClemente, & Norcross, 1992). Social support includes the resources provided by one's social network of family, friends, coworkers, health professionals, and community resources. These networks may assist in the behavior change by providing appropriate information or encouraging the individual to participate in a healthy behavior but can also proves detrimental. Investigating information about an individual’s support system is important to his or her success.

While the TTM and social support research originated in domains outside of exercise, each has been applied extensively to a variety of exercise contexts. Hellman (1997) utilized the TTM to determine that perceived self-efficacy was an important
predictor of stage of change and exercise adherence. Bock and colleagues (1997) studied cardiac rehabilitation patients and got results indicating weekly exercise times are positively associated with advanced stages of readiness, high levels of self-efficacy, low ratings of cons for exercise, and higher use of behavioral processes. In a study done by Guillot et al. (2004) TTM constructs were significantly correlated with adherence to a rehab exercise program (stage of change, social support, decisional balance, self-efficacy, cognitive processes, and behavioral processes). The researchers suggest that the significant relationships that existed between these constructs and the individuals who utilize them are more likely to adhere to an imposed regimented rehabilitation program. Results indicated that high levels of social support were associated with improvement and survival following rehabilitation, and self-efficacy was the best predictor of adherence (Guillot et al). These researchers agreed that the TTM is an appropriate model for rehabilitative exercise program development. While research results to date are encouraging, much still needs to be done to apply the TTM in areas of perceived risk, optimal number of behaviors to treat, subjective norms and problem severity (Glanz et al., 2003).

The Transtheoretical Model is a dynamic theory that uses six stages to integrate processes and principals of change. In an effort to create behavior change, this is a theory that can be tailored through individual stage matching.

Pender’s Health Promotion Model (HPM)

Nola J Pender released the HPM in 1996 as a guide to explore the biopsychosocial processes which motivate individuals to engage in behaviors directed toward health
This high middle range theory derived from behavior theories is a competence or approach-oriented model (McEwen, 2002). “The HPM integrates a number of constructs form expectancy-value theory and social cognitive theory, within a nursing perspective of holistic human functioning” (Pender, Murdaugh, & Parsons, 2002, pg. 50). The constructs that organize the HPM are from non-nursing based theories, but with this model Pender attempts to integrate them to be used for effective nursing care directed at improved health and functional ability (Peterson & Bredow, 2004). The model provides a method for assessment of client health-promoting behaviors; directs nurses to systematically assess clients for their perceived self efficacy, perceived barriers, perceived benefits, and interpersonal influences; and to assess situational influences that are relevant to the selected health behavior (Peterson & Bredow, 2004). The HPM is broad in scope but is quite complex with many subcomponents and on efforts to move toward a more positive state of high-level health and well being (Pender, Murdaugh, & Parsons, 2002). “The HPM is an attempt to depict the multidimensional nature of individuals interacting with their interpersonal and their physical environments as they pursue health” (Pender et al., Pg. 51).

The HPM synthesizes research findings from nursing, psychology, and public health into this explanatory model because Pender believes that multiple variable models are needed to explain human health behavior (Pender, 1996). Thus, her model is based on established theories of human behavior including expectancy value (Feather, 1982), SCT (Bandura, 1986), and the health behavior model (HBM) (Rosenstock & Becker, 1988). According to the Expectancy-Value Model, behavior is rational and economical, saying
that a person engages in activities that are of value to them, are perceived as possible, and whether the subjective value of change is favorable (Feather, 1982). Self efficacy is a major factor in the construction of the HPM. The Health Beliefs Model explains health behavior in terms of several constructs: perceived susceptibility of health problem, perceived severity, perceived benefit, perceived barriers and cues to actions (Rosenstock, 1974). The HBM has been thought of as an appropriate model for disease-preventing behavior but not as an appropriate model for health promotion behaviors (Pender et al., 2002). Pender thought that this generated the need for the HPM, but she included concepts from the HBM such as perceived benefits and perceived barriers, although Pender does not use “fear” or “threat” as a source of motivation.

The HPM classifies health behavior determinants into three specific propositional groupings; individual characteristics and experiences, behavior specific cognitions and affects and situational/interpersonal influences (Pender, et al., 2002). The individual characteristics and experiences which are un-modifiable are innate factors (gender, age, genetics), as well as experienced factors that inform future behaviors (Sorf, & Velsor-Friedrich, 2006). These core concepts of the HPM accentuate the importance of behavior-specific cognition and affect as the primary motivators of behavior (Pender). There are six elements of behavior-specific cognition that affect major motivational significance in encouraging one to engage in health promoting behaviors: perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity related affect, interpersonal influences, and situational influences (Pender). Actions that increase personal health status are hypothesized as related to positive perceptions of the anticipated expected
outcome, minimal barriers to action, feelings about health behavior, presence of family and peer social support, positive role models, and availability of environments that are compatible, safe, and interesting (Pender, 1996). The additional concepts of the model are immediate competing demands and preferences, commitment to a plan of action, and health promoting behavior (Peterson & Bredow, 2004).

Relationships of the HPM’s major concepts are described in the models theoretical propositions. Pender (1996) identifies the following relationships that influence belief: previous related behaviors, inherited and acquired characteristics, and affect and enactment of health-promoting behaviors. Persons will commit to engage in behaviors from which they anticipate self-valued benefits, but a person’s perceived barriers can constrain commitment and behavior. Higher perceived competence or self efficacy to execute a given behavior will increase the likelihood of commitment to action, and greater perceived efficacy results in fewer perceived barriers. When one has a positive affect, positive emotions are associated with the behavior and probability of commitment also increases (Pender). Individuals are more likely to commit to health-promoting behaviors if they have significant others or highly credible people as role models, have assistance, and support to enable the behavior. Peers, health care professionals, and family are interpersonal influences that are important resources who can increase or decrease commitment. Situations and external environments can also influence participation in a negative or positive way. A final theoretical proposition has to do with commitment; commitment to a plan of action is less likely to result in a desired behavior when the competing actions are more attractive and thus preferred over the
target behavior (Pender). A person can modify cognitions, affect, and the interpersonal and physical environment to create incentives for health actions (Pender et al., 2002).

Pender’s (1996) HPM reflects both a nursing and the behavioral science perspective following assumptions: individuals seek to create conditions through which they can express their unique human health potential, they have the capacity for reflective self-awareness including assessment of their own competencies, and they value growth in positive directions and want a balance between change and stability (Pender, 1996). Pender (1996) also assumes that individuals actively seek to regulate their own behaviors; they interact with and transform the environment, and are themselves transformed over time. Health professional are assumed to be a part of the interpersonal environment, which influences the individual throughout one’s life span, and self-initiated reconfiguration is essential for change. Pender et al (2002) predict that when integrating health-promoting behaviors into a healthy lifestyle it will result in improved health, enhanced functional ability and better quality of life at all stages of development.

The HPM metaparadigm addresses people, health, environment, and nursing. The HPM is applicable to any health behavior in which “threat” is not proposed as a major source of motivation for the behavior (Pender, 1996). The individual plays an active role in shaping and maintaining health behaviors, and in modifying the environment context for health behaviors (Pender, 1996). The person or client can be of any age, adolescent to older adult. Pender clearly theorizes about the relationships among individual characteristics and experiences, behavior specific cognition and affect, and behavior outcomes so the model can be easily applied to an individual person or family (Pender et
al., 2002), but does not provide guidelines in selecting which concepts and relationships are appropriate for the specific behaviors (Peterson & Bredow, 2004).

Review of Literature

Childhood Obesity Risk Factors

Most people understand and recognize that obesity has become an epidemic among children. Less is known about why; much of the blame going to fast food restaurants, portion sizes, school lunches, television, video games, and parents. All of these factors contribute to this problem because childhood obesity is a multi-factorial disorder that involves interactions of genetic, environmental, physiological and psychosocial factors over time (Small, Anderson & Melnyk, 2007). Detangling risk factors in each of these four areas is individualistic and difficult, but absolutely key for control and prevention. Within these four major areas of risk are subgroups that include; hereditary components, age, ethnicity, physical activity patterns, dietary and lifestyle habits, endogenous factors, parenting, socioeconomic status and home environment.

Endogenous Risk Factors

Hormonal and genetic factors make up a small percentage of the known risk factors for childhood obesity. An endogenous factor associated with obesity can be either suspected or eliminated from the differential diagnosis in virtually all children based on a careful history and physical examination, eliminating unnecessary and expensive diagnostic testing. Growth failure is a major characteristic of endogenous obesity. Children with associated genetic or hormonal syndromes are generally short, usually at or under the 5th percentile of height for age (Williams, Campanaro, Squillace, & Bollella,
Conversely, children with idiopathic obesity are taller, usually above the 50th percentile (Williams, Campanaro, Squillace, & Bollella, 1997). Even the onset of a hormonal abnormality in a previously tall child will be marked by a significantly slower rate of growth compared with the child's previous growth curve (Williams, Campanaro, Squillace, & Bollella, 1997).

Hypothyroidism, although rarely encountered, is the most frequently considered endogenous abnormality in obese children. By itself, hypothyroidism rarely causes massive weight gain, and its prevalence in obese patients does not significantly differ from its prevalence in the rest of the population (Tagliaferri, Berselli, Calò, 2001). When present, hypothyroidism is usually associated with other signs and symptoms of the disease, such as constipation, cold intolerance and dry skin. Hypercortisolism (Cushing's syndrome) is another frequently suspected cause of endogenous obesity. Although it is usually iatrogenic in nature, it can also be secondary to adrenal tumors or primary pituitary overproduction of adrenocorticotropic hormone (ACTH) (Tagliaferri, et al, 2001). Pediatric hypercortisolism is characterized by linear growth failure and generalized weight gain. Other hormonal causes include primary hyperinsulinism, pseudohypoparathyroidism, and acquired hypothalamic (Tagliaferri, et al, 2001). Some genetic syndromes that are causes obesity include Prader-Willi, Laurence-Moon/Bardet-Biedl, and Turner's (Koletzko, Girardet, Klish, & Tabacco, 2002).

**Ethnicity**

The rate of obesity is increasing for all children regardless of age, gender or race, with Latino boys and African American girls at highest risk (Goron-Larsen, Adair &
Differences among ethnic groups (e.g., African American, American Indian, Hispanic, and Asian/Pacific Islanders) include variations in household composition and size; particularly larger household size in Hispanic and Asian populations (Frey, 2003), and in other aspects of family life such as economic circumstances, media use and exposure, consumer behavior, eating, and physical activity patterns (Tharp, 2001; Nesbitt et al., 2004). Race/ethnicity a powerful factor: ethnic minorities are projected to comprise 40.2 percent of the U.S. population by 2020 (U.S. Census Bureau, 2001), however this factor has not been explored in its entirety. Low-income families are those with incomes below 200 percent of the U.S. poverty threshold, as defined by the U.S. Census Bureau (Denavas-Walt, C, Proctor, B, Smith, J., U.S Census Bureau, 2007). Minority and lower income families experience increase risk related to fewer protective factors regarding unhealthy eating and decreased physical activity (Ruiz, Pepper & Wilfley, 2004). Children from economically stressed families maybe seriously disadvantaged living in neighborhoods lacking supermarkets or safe areas to play, and by high-calorie culturally traditional cuisines or the omnipresent fast food outlets. Children living in poverty are also more likely to live in a single parent family. In the spring of 2002, an estimated 14.0 million single parents had custody of 21.6 million children less than 21 years of age (Grall, 2006). The average family income for custodial parents is 2003 was $28,100 (Grall). The proportion of custodial parents and their children living below the poverty level in 2003 was 31.4% and the rate of participation in public assistance programs was 60.0% (Grall). One public assistance program is the national school lunch program. In 2006 more that 30.1 million children
each day received lunch through this program (USDA, 2007). It has been recognized that those children who eat school lunches have higher BMIs than those who eat brown bag lunches, do to increase calorie and fat intake (Whitmore, 2004). Children who eat school lunches consume about 60-120 calories more at lunch time than those who take brown bag lunches, this calorie increase of is large enough to cause the observed obesity increase (Whitmore).

Other powerful contributing elements that enhance the possibility of obesity risk in racial/ethnic groups are contrasting cultural norms. Cultural dietary and physical activity patterns and perception of obesity may be very different, but it is what is acceptable amongst their ethnic communities and families, and this can be very difficult to change even when health is at risk. Scientists know that the Pima Indians are one of the heaviest people in the world; some adult weigh more that 225kg (Schulz, Bennett & Ravussin, 2006). The Pima Indians who live in the U.S. have the highest rate of type 2 diabetes of any population in the world (77% of people 55 and older) and have correspondingly high obesity rates. Pima Indians living in Mexico have much lower rates of type 2 diabetes and obesity than those in the U.S, particularly Arizona (Shulz et al.). These two groups are genetically similar, but their diets and levels of physical activity are very different (Shulz et al.). As a result, the obesity rate among the American Pima men is 10 times that of the Mexican Pima men.

Genetic Factors

The observation of coexistence and co-inhabitation between several obese members within a family is very common and suggests the involvement of genetic factors
in obesity (Bray & Bouchard, 2004). It has been estimated that 40% is of obesity is still attributable to independent genetic influences, while cultural and societal factors may explain at least 30% of the variation (Wardle, Carnel, Haworth, & Plomin, 2008). The risk of excessive weight gain in children of families with obese parents is increased two to three times for moderate obesity and up to eight times for severe obesity (Marti, Moreno-Aliaga, Hebebrand, & Martinez, 2004). Studies with large sample sizes, encompassing family members of different degrees of relatedness has allowed for the evaluation and the statistical association of obesity objective indicators, BMI and the degree of the relationship (Barsh, Farooqi, & O'Rahilly, 2000). The correlation for BMI is lower between husband and wife and uncle and nephews, and increases between parents and children and among siblings (Barsh, Farooqi, & O'Rahilly). The correlation for BMI is higher in monozygotic and dizygotic twins (Barsh, Farooqi, & O'Rahilly)., suggesting that the higher degree of relatedness the high the similarities in BMI. In populations such as Pima Indians, it has been found that this population shares alterations in basal metabolism rates and/or in fat oxidation after food intake confirming the hypothesis of genetic involvement, as well as the fact that genetic factors can modulate the effects of physical activity and diet on weight and body composition (Shulz et al., 2008). However, this information is not enough to prove unequivocally the genetic origin of obesity, since families and populations share other commonalities besides the genes such as lifestyle choices, dietary habits and environment (Bray & Bouchard, 2004). Although genetics are very important risk factor, it is not the conclusive factor, whether a person will be obese or not.
Lifestyle and Dietary

It is unlikely that changing gene pools can explain the doubling or even tripling of obesity prevalence rates in certain groups over the last twenty years. Twenty years is too short a period to affect the genetic background in affected populations, confirming the role of environmental factors (Damcott, Sack, & Shuldiner, 2003). The processes of modernization and economic restructuring in both low- and high-income countries have influenced nutritional and physical activity patterns that contribute to the increasing rates of obesity (Swinburn, Caterson, Seidell, & James, 2004). The growing prevalence of obesity around the world is mainly attributed to changes in lifestyle. The world food economy has contributed to the shift in the lifestyle choices in dietary patterns, for example, increased portion sizes and increased consumption of energy dense food high in fat particularly saturated fat, and low in unrefined carbohydrates and fiber. Between 1977 and 2000, an 83 calorie/day increase in caloric sweeteners was observed in the U.S. from 1977-2000 for all individuals 2 years and older, representing a 22% increase in the proportion of energy derived from caloric sweeteners (Popkin & Nielsen, 2003). Today the portion sizes of some food items such as candy bars, chips, snacks, soft drinks, French fries and sandwiches have all increased and this is parallel with the rise in prevalence of obesity rates (Moreno & Rodriguez, 2007). Most food items at restaurants can be ordered as venti, animal style, jumbo, biggie, super size or even king size, all in their own ordering language, but all meaning the same thing; the biggest one you have. When eating in restaurants individuals consume larger amounts of high caloric food that have and adverse affect on dietary quality (Bowman et al., 2004), less fruit, vegetables,
milk and cereal. Despite increases in food portions intake, children fail to reduce consumption by satiety signals that compensate for their feeling of fullness (Ello-Martin, Ledikwe, & Rolls, 2005; Rolls, Engell & Birch, 2000). It has been shown through research that infants and toddlers are able to correctly self regulate their intake, but as they get older children are more influenced by portion size and are unable to recognize when they are full (Rolls et al.). Children who are unable to correctly self regulate their food intake will increase consumption with portion size (Rolls et al.). After excessive intake of high energy dense food, compensatory eating responses may not be sufficient to suppress hunger or to delay eating. Eating low energy dense foods such as; fruits, vegetables and soups, however, maintains satiety while reducing energy intake (Ello-Martin et al.). The food composition of the diet has an influence on eating behavior and vice versa (Moreno & Rodriguez, 2007).

In 2004, there were 195,133 fast food restaurants (or "quickservice restaurants" by the industry) in the United States (County Business Patterns, 2004). In 2005, estimated sales exceeded $135 billion (Austin et al., 2005). Fast food is found in virtually every American community; along highways; and in airports, shopping malls, office buildings, museums, and hospitals. Fast food companies attract children by including toys of their favorite movie characters with meals, operating playgrounds at their restaurants, and choosing locations that are frequented by children. Fast food is eaten by 30% to 50% of children in the U.S. on any given day, and on days when they eat fast food, children consume 420 to 525 calories more than on days without fast food (Paeratakul, Ferdinand, Champagne, Ryan, & Bray, 2003). Fast food restaurants make purchasing their highly
caloric, poorly nutritious food convenient and attractive; one does not even have to get out of the car. For a single person fast food may not be that costly but for low income families with two and three children it can be out of their budget range. However, even within a grocery store the foods that are processed and are energy dense are cheaper to purchase than fresh produce, protein containing foods, and other nutritious items.

The American Dietetic Association (ADA) (2007) advocates for healthful eating habits and engaging in routine physical activity for everyone. The ADA is concerned because the majority of children and adults are not meeting daily requirements for food or exercise. The ADA supports the American Academy of Pediatrics (AAP) recommendation that children age two gradually reach a diet with less than 10% of dietary energy from saturated fatty acids and less than 30% from total fat by five years of age (AAP, 2003). It is also recommended that cholesterol intake is less than 300mg per day (AAP, 2003). The AAP (2001) is also concerned about the amount of fruit juice consumption and recommends no fruit juice in children less than 6months of age, no juice in bottles and no juice at bedtime. Juice should be restricted to 4-6 ounces a day in children ages 1-6 years and 8-12 ounces per day in children 7-18 years of age (AAP, 2001). The greater the sweetened drink consumption, the greater the weight gain (Malik, Schulze & Hu, 2006). Along with juice consumption there has been an increase in consumption of soft drinks over the past decades. Results from two cross-sectional studies show that there is a positive relationship between consumption of sugar-sweetened beverages and overweight/obesity development (O'Connor, Yang, & Nicklas, 2006; Malik, Schulze & Hu, 2006).
Physical Activity

Food patterns combined with a decline in energy expenditure have been associated with a sedentary lifestyles and an increased rate of obesity among children (Strong, Malina & Blimkie, 2005). People may be forced into sedentary lifestyles due to increased motorized transport indoors and out, labor-saving devices at home, and the phasing out of physically demanding manual tasks in the workplace due to technology (WHO, 2008). Not only has the work place become less physically active, so have leisure time activities, which are now predominantly devoted to physically undemanding past times such as, video games, surfing the web, and movies (WHO). The shift in patterns promotes obesity and these environmental factors are referred to today under the general term of “obesogenic” (WHO). Parents modeling this unhealthy behavior will increase the risk that their children will continue this trend and be at risk for obesity (French, Story, & Raven, 2001)

The majority of children ages 5-17 years today are not meeting the recommendations for physical activity. Current guidelines from several U.S. pediatric professional organizations recommend that children and adolescents get at least sixty minutes of cumulative physical activity per day, with the emphasis on activities appropriate for age and development (AAP, 2006; Strong, Malina & Blimkie, 2005). In 2005, a national survey of adolescents in grades 9-12 reveled that less that 36 % engaged in at least sixty minutes of activity on at least five out of the seven preceding days and just under 10% had not participated in any vigorous exercise at all (CDC, 2005). Recent evidence also has found great disparities in children’s free time activities in school, after
school and on weekend hours. A U.S. national survey of 9-13 year olds in 2002 found that up to 22.6% did not engage in any free time physical activity at all (CDC, 2002). Many families rely on the school system to provide children with their primary source of physical activity. Unfortunately due to various constraints many schools fall short in meeting the parent’s expectations. In the United States in 2006, only 3.8% of elementary school, 7.9% of middle schools and 2.1% of high schools actually provide daily physical education (Lee, Burgeson, Fulton, Spain, 2007). However, in 2006 approximately 77% of middle and 91.3% high schools do offer at least one interscholastic sports (CDC, 2007). Research shows that the children involved in extracurricular sports have greater lean body mass and less fat (Ari et al., 2006) and have tend to perform better academically (Ahamed et al., 2007) but only about 38.5% of U.S. children aged 9-13 years report involvement in organized sports (CDC, 2003).

**Parenting**

It may be impractical and ineffective to rely on school systems as the primary or sole source of physical activity. Schools can provide education on the benefits of exercise and encourage physical activity during recess and in after-school programs but the bulk of the (Veugelers & Fitzgerald, 2005). Parents can be aiding in the process of providing physical activity for their children and modeling both healthful eating and exercise behaviors, but studies suggest otherwise. According to the CDC national health survey of 68,556 non-institutionalized U.S. citizens between 2000 and 2005, there was little change in the percentage of adults engaging in usual daily activities and leisure-time physical activities (Barnes, 2007). The percentage of adults who engaged in no leisure-time
physical activity increased from 38.5% in 2000 to 40.0% in 2005, and the percentage of adults who engaged in regular leisure-time physical activity decreased from 31.2% in 2000 to 29.7% in 2005 (Barnes). Many studies have demonstrated family assembly as risk factors for obesity because a family provides a child with their major social, physical and contextual learning environment (Barsh, Farooqi, O'Rahilly, 2000). Parents have a direct influence a child’s amount of free time and structured activity level and can create an active culture in household. Multiple studies indicate that children watch excessive amounts of television and unlike earlier generations are not getting enough physical activity or even recess time at school (Francis, Lee, & Birch, 2003; French, Story, & Jeffery, 2001; Wardle, Guthrie, Sanderson, Birch, & Plomin, 2001). The AAP (2006) recommends that children under two years of age should not watch any television and preschool children should only watch two hours or less a day. It is important to reduce sedentary activities and increase family time physical activities for successful weight management in children (AAP, 2006). Finally, it is important for parents to realize that their children’s perception of competence, self-efficacy, enjoyment, beliefs and attitudes about physical activity have a strong and direct impact on their child’s activity levels (AAP, 2006). Therefore, parental support and encouragement, as well as increased exposure to a variety of activities and opportunities for skill development are very important for children (Gustafson & Rhodes, 2006).

Parenting style and feeding style are crucial factors in fostering a healthy lifestyle and awareness of internal hunger, satiety cues, and ideas about physical activity. Parents influence children's diet quality and eating patterns through the foods made available at
home, role modeling of eating behaviors, their child feeding practices, and family meal patterns (Patrick & Nicklas, 2005). Children learn to accept and prefer versions of food to which they are exposed to (Patrick & Nicklas). More recently, Fisher and colleagues (2002) found that parents who consumed more fruits and vegetables had daughters who consumed more fruits and vegetables. Such research suggests that parental modeling of eating behaviors and attitudes could influence children’s eating style and weight outcome. Eating styles that contribute to familial patterns of obesity may be passed down through generations. In contrast, children learn to dislike food that must be eaten to obtain reward, such as eating their vegetables to earn playtime. Parent being to overly controlling with food practices may interfere with the child’s ability to self regulate their food intake in response to hunger, and satiety. Instead children may eat in response to environmental cues such as parental prompting to eat or not eat (Birch, Fisher & Davidson, 2003; Fisher & Birch, 2002; Lee, Mitchell, Smicklas-Wright, et al., 2001).

**Intervention Programs**

Numerous studies investigating weight loss interventions and weight-related disease prevention have been conducted over the past 30 years (Knowler, et al., 2002; Wadden & Osei, 2002). To date, proposed therapeutic approaches for obesity have had little success. In fact, according to a recent Cochrane Library review standard effective therapy for obesity is not yet available, there is a limited amount of quality data on the effects of programs to treat childhood obesity, and as such no conclusions can be drawn with confidence from the research results (Summerbell, et al., 2005). This imposes the need for further research in areas of intervention. Multiple studies have been published
identifying determinants of weight gain and childhood obesity risk factors, expanding the knowledge base to provide successful prevention intervention. However, there is a limited amount of controlled studies on prevention of overweight and obesity in children and adolescents. Interventions have differed with respect to framework, setting, duration of observation and follow up duration, focus, variable of outcome, and statistical power (Muller, Daniel, Landsberg, & Pust, 2006). Populations have varied from everyone in a community or school (universal prevention), at high risk individuals/families (selective prevention) and already overweight or obese individuals to prevent further weight gain (targeted or secondary prevention) (Muller et al., 2006). Interventions have been based on the following frameworks: family support (parental weight loss, involvement, parent shopping, and family lifestyle changes), exercise (integrating physical activity into routine), dietary intervention (formal programmed diet and food education), and behavioral modification techniques (group support, individual diet therapy, self monitoring, goal setting, and cue elimination) and cognitive effective behavioral intervention (consistent praise or incentives). Researchers have used various outcome parameters of risk and co-morbidities as well as indicators of health behavior change. Most studies have determined mean values obtained by comparing the intervention group with non-intervention group, but are still lacking a detailed analysis of the effects of intervention on the incidence of overweight and obesity (Muller et al.).

The adoption of new behaviors typically follows a predictable pattern. High adherence and dramatic behavior change characterize the initial days and weeks after an intervention, followed by a gradual return to previous behaviors over the ensuing months.
and years. This gradual migration away from newly adopted healthy behaviors toward former, less-healthy behaviors can be called *health behavior decay* (Anderson, Konz, Frederich, & Wood, 2001). Many individuals attempting to use healthy behaviors to lose weight follow the same pattern. They have period where initial weight loss is experienced when diet and exercise efforts are most consistent, followed by a period of health behavior decay, when new, healthy behaviors are replaced with former, less-healthy behaviors, resulting in weight gain and discouragement. Changes in nutrition and physical activity behaviors produce clinically significant improvements in risk factors, but with the passage of time the degree of risk reduction diminishes. The amount of health behavior decay that occurs among intervention participants is largely determined by the characteristics of the intervention (e.g., design, length, intensity); level of individualization; and environmental factors, such as social support and barriers (e.g., time, money, lack of enjoyment). Well-designed, intensive interventions that have aggressive follow-up are assumed to be likely to result in less decay and, subsequently, lower risks long-term (Merrill, 2008).

In one resent study researchers evaluated data from the Coronary Heart Improvement Project (CHIP) to determine whether improved health behaviors associated with this intervention persisted or decayed during the eighteen months of follow up and to answer the following questions; does health behavior decay exist?; How long can significant improvements in behavior be maintained?; and does decay occur equally in both nutrition and physical activity behaviors? (Merrill, 2008). The primary aims of the CHIP program were to improve participants’ cognitive understanding of the importance
of healthy lifestyles, nutrition and physical activity behaviors, and risk factors associated with diabetes, hypertension, cardiovascular disease, and cancer. 348 participants aged 24 to 81 volunteered to enroll in the CHIP of which 211 (61%) were available for entire eighteen month evaluation. The program was designed to run for four weeks four times each week for two hours sessions in which the individuals would receive instruction through lecture-style presentations (Merrill). The also included an optional alumni organization after the first four weeks was over to help prevent relapse by attending special lectures on healthy living and help participants maintain their new behaviors. Alumni receive a monthly newsletter that contains news of health-promoting community events such as healthy dinners, walking groups, and support-group meetings. This was a theory-based intervention planning was used to develop the curriculum, class design, alumni association (i.e., program designed to help participants maintain positive behavior changes), and take-home assignments. Data from twenty-one selected physical activity and dietary behavior variables was gathered at baseline, six weeks, six months, twelve months, and eighteen months. These researchers concluded that the most dramatic improvements in both physical activity and nutrition behaviors occurred at six weeks, but after 6 months, participants in the intervention group showed significant reductions in BMI, weight, body fat, systolic and diastolic blood pressure, and resting heart rate. Physical activity measures increased slightly at six and eighteen months, although most of the nutrition variables spiked at six months, followed by a one year period of decline but did not return to baseline. Another study reveled that using a six month lifestyle change intervention to reduce cardiovascular risk factors in obese, sedentary,
postmenopausal women, demonstrated six and twelve month changes in physical activity with no decay, but newly adopted nutrition behaviors were not maintained and 63% of lost weight was regained at 12 months (Carels et al, 2004). Burgess, Grogan and Burwitz (2006) research revealed that girls aged 13-14 participation in six weeks of aerobic dance significantly reduced body image dissatisfaction (Attractiveness, Feeling Fat, Salience and Strength and Fitness) and enhanced physical self-perceptions (Body Attractiveness and Physical Self-Worth) at a twelve week evaluation, although these improvements were not sustained. Due to the gap in knowledge of what is the most effective intervention duration in children and adults there are implications and future research.

The most recent literature in the area of childhood obesity prevention and management has demonstrated the success of implementing theory-based interventions that apply psychological principles of behavior change to improve health outcomes. The research indicates that certain constructs have been integrated into obesity programs and have helped individuals to become more motivated for action toward their nutrition- and exercise-related goals. These constructs include goal setting (Cullen et al., 2001; and Task Force on Community Preventive Services, 2002), self-efficacy (Dallow & Anderson, 2003; and Roach et al., 2003), and readiness for change (Dallow & Anderson, 2003; Frenn et al., 2003; and Marshall & Biddle, 2001). Interventions that incorporate these constructs are tailored to each participant's needs, preferences and their readiness to acquire healthy eating and exercise habits. Tailoring a program to a participants needs is very important because obesity can not only cause physical consequences, but participants may also face emotional consequences, negative self-image, lowered self-
esteem, and difficulty making healthy choices, which can all provide barriers in treatment (Faith, Saelens, Wilfley, & Allison, 2001).

Theoretical interventions aim is to change the way people think and react in relation to eating and physical activity, instead of simply being knowledge-based like traditional obesity programs. Although there is strong support for the applicability of behavior change theory to the issue of diabetes treatment adherence among children with Type 1 diabetes mellitus (Grey & Berry, 2004 and Wysocki, 2004) and to the issue of asthma management in children (Guevara, 2003), little is known about the place of behavior change theory in obesity prevention in children. One study has successfully adapted the theory-based change constructs from the TTM to children, but they reported that it was not clear if the theory-based constructs were central to the process of health behavior change for children like they are for adults (Beckman, Hawley & Bishop, 2006). The researchers believe different techniques are required to get children to take responsibility for their health, as compared to adults. Children tend to be more extrinsically motivated in general, and it is not clear when they shift from being extrinsically motivated to intrinsically motivate with regard to health-related goals (Beckman et al.). Programs that incorporate the TTM can still be effective with participants who do not possess much intrinsic motivation. For example, in the contemplation stage, individuals are asked to weigh the pros and cons for a particular health behavior and determine the costs and benefits of making a change. These costs and benefits could very well be tangible and external to the individual, e.g., parents establish a system in which children can only watch a favorite television program if they play
outside for at least an hour. Children have the intellectual capacity at a young age to understand such a system of rewards and consequences. These concepts are fundamental to behavior modification in children and may be especially appropriate when used in exercise and nutrition programs designed for children (Beckman et al.). Future studies would benefit from examining this issue more closely.

**Family-Based Interventions**

Intervention studies focused on childhood obesity prevention consistently demonstrate the importance of family involvement (Faith et al., 2001; Muller, Danielzik, Landsberg & Pust, 2002; Quattrin, Liu, Shaw, Shine, Chiang, 2005). These studies suggest that at least one parent should be involved in any intervention. In a review by Faith et al. (2001) of the current status of the behavioral treatment of childhood obesity, the researchers concluded that family-based programs have reliably produced the best short- and long-term effects on weight reduction. Family-based multi-professional behavioral treatment programs are considered the “gold-standard” of therapy (Quattrin et al., 2005), but they require a number of professional resources, prolonged teamwork that are not always available in public health facilities nor easily accepted by families, and are highly expensive. One study found a strong and consistent association between increased family support for physical activity and children's increased level of physical activity (Sallis, Prochaska, Taylor, Hill, & Geraci, 1999). The role of parents is multifaceted and they provide an important contribution to treatment. Findings from a qualitative study by Styles, Meier, Sutherland & Campbell (2007) indicated that parents from three different ethnic groups were concerned about their children's weight, health behaviors, and overall
development. However, these parents believed they lacked the knowledge, skills, and support to best help their children to be healthier and control weight. Furthermore, they thought that institutions such as schools, media, and health providers were not communicating effectively and sometimes did not appreciate or support their efforts.

Appropriate health education parents can provide effective role modeling in shaping their children's patterns of eating and exercise. They can determine what healthy food choices are available at home, provide appropriate control and discipline, determine the child's access to physical activity, and identify physical activities that can be enjoyed by the family as a whole (Styles et al, 2007). Recently there has been a surge in environmental approaches to obesity, which speculate that the environment is responsible for the variance in level of activity, food intake, and food selection. Such approaches attempt to alter what is now commonly referred to as the obesogenic or an environment in which sedentary lifestyle and unhealthy diets are promoted (Allison et al., 2001; Davison & Birch, 2002). Birch & Davison concluded that the environment provided by the parents is crucial to the development of the child's eating and exercise habits and that overweight parents are more likely to set up an environment for themselves and their children that promotes obesity.

*Lifestyle Behavior Modification*

Another proven successful approach to obesity prevention and weight loss is lifestyle behavior modification, a multifactorial approach that combines behavioral, dietary, and exercise components. Although this approach has been successful for initial weight loss, only approximately 20% of overweight individuals are able to maintain a
loss of at least 10% of initial body weight for over a year (Wing & Phelan, 2005).

However, research has shown that long-term weight maintenance can be significantly improved with extended contact to therapeutic resources, such as people who will support them in their weight loss (Perri & Corsica, 2002). Parents can learn proper strategies to become their child’s resource, in which they will provide behavioral reinforcement and reward their child’s efforts at building healthy fitness and nutrition habits (Faith et al., 2001). Individuals who are able to successfully maintain their weight loss from 2-5 years have an increased chance of longer-term success (Wing & Phelan, 2005). Due to the difficulty of maintaining substantial weight loss, the strong associations between obesity and disease, and an increase in childhood overweight and obesity, research efforts have shifted their focus from obesity treatment and secondary prevention efforts for adults, to primary and secondary prevention efforts with children (Knowler et al., 2002). Childhood obesity increases the risk of obesity in adulthood. Therefore, preventing childhood obesity may be an effective means of preventing adult obesity and the development of obesity-related health conditions.

Comparable Interventions

A limited amount of research has been done in the area of family-based lifestyle behavior modification. One family oriented obesity prevention pilot program applied theory-based health behavior change constructs to aid in the prevention of obesity in children (Beckman, Hawley & Bishop 2006). Constructs of goal setting, self-efficacy, and readiness for change within a community-based program designed for fifth and sixth graders and their families. Beckman et al. translated these constructs through games, worksheets, and a helpful acronym, and demonstrated
they could be made developmentally appropriate and comprehensible to eleven and twelve year olds. Researchers used a series of exercises that prompted the families to align their health-related goals according to the level of priorities. Then the researchers guided these families in identifying the steps that they would need to take to achieve their goals through a detailed action plan, which included a method of monitoring progress toward goals, and a method of rewarding themselves for taking action. However this program only had one day a week education, making the program mostly home based. The families did not have sports, physical, and nutritional training sessions together or with other peers.

Another study examined the effectiveness of parenting-skills training, with and without intensive lifestyle education, as part of parent-led, family-focused weight management of 6- to 9-year-olds (Golley et al., 2007). This approach addressed family and parental factors influencing children's eating and activity behaviors and achieved a moderate reduction in adiposity after 12 month, but there was no long term follow up planned so it is unknown if the participants had any long-term change. The researchers included focused lifestyle knowledge and skills sessions for parents on the following topics: family-focused healthy eating with specific core food serve recommendations, monitoring, label reading, snacks, modifying recipes, being active in a variety of ways, discussing roles and responsibilities around eating, managing appetite, self-esteem, and teasing. While the parents were in these sessions, their children took part in supervised activity sessions developed by physical activity experts. The sessions consisted of fun, noncompetitive games designed around aerobic activity and development of fundamental motor skills. Sessions were designed as play rather than exercise and were diversional rather than interventional (Golley et al.). This program included family intervention but children and parents did not work
together, nor did the children get to learn about healthy eating and being active from the educators.

Another study done by Roach et al (2003) attempted to increase young adults' sense of self-efficacy for weight loss during a twelve week weight loss promotion program. This twelve week program was adapted from The Sensible Weigh Weight Loss Program, developed by Spahn and colleagues (2003) to promote fitness and optimal weight among US Air Force personnel. The intervention consisted of twelve weekly sessions, each lasting approximately 1 hour. Each session included nutrition education on a topic related to healthy eating patterns and one or more activities intended to promote self-efficacy for weight loss (Spahn et al). The researchers found that as the participants' self-efficacy improved, their eating habits improved and their health outcomes were more positive. The young adults did have peer interaction throughout this program; however, they did not include families, nor did they include an active physical training component. Currently, there is no research available that includes all of the elements which will be included in the Marathoners Program: Family-based, promoting self-efficacy, lifestyle behavior modification and nutrition, health, and physical education and training.

Summary

Theories that focus on the behavior of the individual constitute an important part of the scholarly foundation that addresses health promotion, health behavior, and intervention. The previous section describes three well-developed theories and models of health behavior and health promotion: Social-Cognitive Theory (SCT), The Transtheoretical Model (TTM) and Pender’s Health Promotion Model (HPM). These
theories not only have been widely used in research and recent literature, but also have other commonalities. The concept of self-efficacy is embedded within each of the three theories (SCT, TTM & HPM), establishing the concept that making small changes to get to a final goal is more effective than trying to achieve a goal through a single effort. The concept of readiness to apply oneself and tailoring an intervention to meet the individuals’ needs are central constructs to both the TTM and HPM. An amalgamation of some of the concepts from the three theories provides the theoretical framework and underpinnings of the Marathoners Program. Knowing and identifying the risk factors of the overweight and obese child population are important because this understanding aids in developing prevention concepts. The risk factors identified in this chapter will help guide the selection of participants for the Marathoners Program. There is a limited amount of quality data on the components of programs to treat childhood obesity that allow one program’s approach to be favored over another. However, lifestyle behavior change and family-based interventions have been proven through research to be more effective ways to positively impact childhood obesity prevention and weight loss. No program has proven long-term success, so the goal of the Marathoners Program is to address this need.
CHAPTER THREE

Introduction

The purpose of this chapter is to describe the Marathoners Program and the elements of the program: participants, setting, and description of content. This chapter will also propose the implementation of a feasibility study. The Marathoners Program is an innovative intervention designed by the author to help close the gap between knowledge about childhood obesity risk factors and appropriate effective childhood obesity interventions. The author’s background in health and physical fitness, and work with pediatrics and their families coupled with review of literature informed the design of the Marathoners Program. In way of introduction, this author has been a runner and has taught various group fitness classes for the past six years. She has worked with a pediatric population in acute care and primary care settings for six years as well providing the incentive to initiate this project. Concepts from several theories were used for the framework of the Marathoners Program. The primary aim of this program is to help families and early adolescents make healthy dietary and physical activity behaviors changes, and integrate those changes into their lifestyles to create long-term change.

A proposed feasibility study of the Marathoners program is discussed in this chapter. This study would be necessary prior to implementation of a broader family-based multifactorial program, accessing the feasibility of family and early adolescents’ participation on a larger scale as well as its possible impact on long-term change.
Marathoners Program

According to the Britannica Concise Encyclopedia (2006) a marathon is a cross-country long-distance footrace of 26.2 miles, 385 yards (42.195 kilometers), which is a contest of prolonged endurance and speed. What are Marathoners? Marathoners are disciplined, self-empowered athletes, who take part in, and embrace the challenge of running long-distances. By setting goals, being persistent and realizing that the distance is going to be a struggle and accepting that as part of the challenge, they engage their minds to enable the bodies to finish. They have body awareness, confidence, and recognize their boundaries and what will fuel them efficiently. They take pride in calling themselves runners. The Marathoners program would aim to cultivate these qualities.

The Marathoners after-school program has been designed for children ages ten to thirteen and their parents/caregivers. This program follows a family-based model because research suggests that parental involvement is an important component of childhood obesity management (Quatrim et al., 2005) and family-based programs produce the best short and long-term effects (Faith et al., 2001). Obesity tends to run in families, and it would be counterproductive to treat a child when one or both parents may be modeling or supporting unhealthy lifestyle choices such as overeating or under exercising (U.S Department of Health and Human Services, 2001). Environment provided by parents is crucial in the development of a child’s eating and exercise habits as seen in Birch and Davidson’s (2002) research findings. Research has shown that interventions focusing primarily on parenting style, rather than specific health behaviors have been effective for obesity treatment of children (Golan et al., 1998; Golley et al., 2007). However, the
The Marathoners Program’s design would not propose to change the parenting style that is contributing to their child’s obesity or putting them at risk for obesity, but would educate the parents and children about incorporating activity and healthy eating into their own lifestyles.

The Marathoners program would run for a twelve week duration and be held three days a week for two hours at a time. This duration was chosen on the basis of the results CHIP study review (Merrill, 2007) which concluded that major physical and activity changes occur at six weeks versus six to eighteen months, but need support and maintenance for better long term outcomes. This program did not have hands on physical activity training but did include multiple components of eating and physical activity behavior education with workbooks and take home tasks. The CHIP program did not use children in their study but the researchers suggest the most efficient way to improve health risks among the general population is to ensure healthy behaviors and attitudes are learned early in life (Merrill). Twelve weeks with consistent contact, follow up to a year post completion, and hands on learning would probably allow for healthy change to occur among the participants and would provide an increase in self-efficacy which directly relates to the probability of behavior change (Bandura, 1997).

This family-based program would incorporate running and reinforcing that physical activity should be routine in everyday lives. During the two hours the participants would have educational and game times integrating the educational content presented by a weekly guest. Guest speakers would come to the designated park, and discuss information on topics such as healthy foods, reading food labels appropriately,
making appropriate food and exercise choices, incorporating physical exercise into
everyday life, and the physical risk factors of being overweight or obese. These
discussions could take place at a covered ramada at the park over a 45 minute session
(see Appendix B for example). Guest speakers may include coaches from local sports
groups, physical trainers, nutritionists, group fitness instructors, and diabetic educators.
Parent participants would be given tools such as parenting tips and physical activities
they can do with the whole family to help them become advocates and role models for
their children. Overall, the author believes by following the Marthoner’s proposed
program parents, children, health care professionals, and coaches could come together;
they could spark community change and build an innovative, healthy environment for
children.

Participants

Twelve adolescents’ ages ten to thirteen and their parents would be selected for
participation. This age group was chosen because age/grade are important background
characteristics influencing physical activity behavior (Pender & Wu, 2002). There is a
trend of declining frequency and duration of physical activity occurring across the
transition into middle school with evidence that decreasing social support for activity
contributes to this change (Pender & Wu). In Arizona, many of the children transition to
middle school after the fifth grade, when they are usually eleven to twelve years of age.
Female students demonstrate a significant decrease due to a loss in perceived benefits of
physical activity whereas data from male students demonstrate a decline in exercise due
to decreasing self-efficacy (Wu, Pender, & Noureddine, 2003). In Pender’s Health
Promotion Model the behavior specific cognitions and affect category suggests that people are more likely to participate in an activity if they perceive it as beneficial to them, and if they believe they are capable enough to do it (Pender, 1996). Increasing self efficacy, providing a positive support system, and educating the children about actual health benefits of exercise during this transition would be all important goals of the Marathoners Program to possible decrease this trend of declining physical activity frequency.

The target population of ten to thirteen years of age was selected for many other reasons. First, while many adolescents struggle with a negative body image and unhealthy eating patterns, the body image attitudes of children at this age are more malleable, and thus, prevention efforts may meet less resistance (Kater, Rohwer, & Levine, 2000). Second, as children approach the age of eleven or twelve, they become more autonomous in their health-related self-management behaviors as compared to when they were younger (Pradel, 2000). Some evidence suggests that children's internal health locus of control (i.e., their beliefs about the degree of reinforcement and control they have over the status of their own health) becomes very apparent during the transition to adolescence (Cohen, Brownell, & Felix, 1990). This is congruent with Jean Piaget’s (1972) model of childhood cognitive development. Piagetian theory suggests that when some children reach the age of eleven, they enter the stage of “Formal Operations,” which is characterized by the development of abstract thought, hypothetical reasoning, and mastery of thought (Piaget, 1972). Children who have reached the stage of formal operations can design and test hypotheses, engage in deductive reasoning, use flexible
thinking, imagine intangibles, understand proportionality, generate alternative strategies, plan for the future, and reflect on their thinking processes. At this cognitive stage children can form mental images of the potential positive and negative consequences of certain health behaviors, which will allow them to assume a more internal locus of control with regard to their personal health management choices.

Although maturation establishes the basis for the Formal Operations stage when children reach the age of eleven, not all children will automatically move to this cognitive stage as they mature, and it seems that a special environment is required for most individuals to immerse fully in the stage. A difference between early and late formal operations has been identified showing that the amount of complex reasoning tasks able to be completed increases as a child ages (Klaczynski, 2000). However, even though the reasoning skills improve throughout the adolescent years, they do not show formal operations and logical scientific reasoning in all tasks at the same time (Klaczynski & Narishimham, 1998). There is evidence that teens today thirteen to fifteen are better able to solve formal operational tasks. For example, 66% of teens in 1996 showed formal operational though, whereas only 49% of teens in 1967 (Flieder, 1999). Achievement of formal operational thinking depends on age, education level and specific experiences, such as exposure to math and science (Mwamuenda, 1999). Choosing an age group earlier that ten to thirteen may be very challenging and less effective because they would be asked to think abstractly about change and to consider all of the logically possible outcomes to a situation as some change constructs (e.g., the transtheoretical model) require (Beckman, Hawley & Bishop 2006). However, these potential concerns have brrn
considered in the design of the Marathoners program and this would be reduced by incorporating age-appropriate language into the activities and education session, and by eliciting concrete examples from the children, making the learning process interactive (Beckman et al.).

All participation in the Marathoners Program should be strictly voluntary. Boys and girls of all races would be allowed to participate, as well as, adult family members or a primary caregiver of choice. Potentially if a child’s caregiver is handicapped he or she may have another constant adult figure participate. Children can be of a healthy weight but should have at least one risk factor for obesity (e.g., low-income family, overweight parent, ethnicity, sedentary lifestyle), which would be determined in the application process. Children who are defined as overweight or obese according to WHO (2006) BMI score would be encouraged to participate, but they would have to be medically cleared by a health care provider to attend. Preexisting conditions such as asthma or diabetes would not excluded the parent or child, but would be required to be well managed by a health care provider, and have availability to the medical supplies needed at all sessions to control an asthmatic or hypoglycemic/hyperglycemic episode. Preexisting conditions that would be excluded include any mental or physically disability for which the child would need special services and learning tools to participate. Children included should be able to function at a ten to thirteen year old cognitive level.

A group of stakeholders that would participate and would be very important to the Marathoners’ team are the staff members. The staff members could include community
volunteers, and guest speakers that have expertise in the proposed areas. Without their time, energy, expertise and support, the Marathoners Program could not take place.

Setting

The Marathoners Program would be held at a centrally located Tucson park that is highly accessible by bus or car. Using a local park to hold this program instead of a public/private schools’ property should decrease the need for multiple permits and permission from various advisory boards. The park should have ramada areas with benches and tables that would be used for the education sessions. The park should also allow the program to have access to basketball and volleyball courts and baseball and soccer fields. The program could be held in the spring time to alleviate some of the weather problems that come with the Arizona summer, such as heat exhaustion and dehydration. The program would take place from 4-6pm Monday, Wednesday, and Friday.

Proposal of a Feasibility Study Implementation

The Marathoners Program would partner with an existing well established non-profit organization working with children within the community. This partnership could create support from the community and could allow easier access to children and their parents. Since this proposed feasibility study would include child participation approval may be require from the human subjects’ board. First, for this program to begin there twelve participants, their parents, and staff members would be recruited. Pamphlets would be generated including information about the Marathoners program, its goals and the eligibility criteria. These pamphlets would be passed out six weeks prior to the start
date of the program to those children and parents involved in the non-profit organization, but also to children at local schools. Permission would need to be granted by the school before publicizing the program to their students.

Should permission be granted by the school, teachers and nurses would be in-serviced about the program by a staff member of the Marathoners Program, a week prior to the release of the pamphlets. School teachers and nurses could assist in recruitment by identifying at risk children and sending pamphlets home with them. Interested families would fill out registration forms and sent in for evaluation. A Marathoners staff member would review the application for inclusion/exclusion criteria and call the families about volunteering in the program.

Participants would be required to complete a medical evaluation and receive a written permission from a health care provider for program participation. If the participant should have a preexisting condition such as asthma the health care provider would be required to include a written statement that the condition is controlled and no problems are foreseen. All individuals who would be allowed to participate would be required to complete an informed consent or an assent from for the child. All children and parents should understand that they are voluntarily participating in the program and will be given no monetary incentives. Personal incentive to the participants would include being able to participate with no program fee, personal positive change, and medals would be distributed to individuals who complete the program successfully. It would be required during the medical screening, that weight and height be measured and body mass index (BMI) is determined using the Baylor College of Medicine’s tool, Children’s
BMI percentile-for-age calculator. (Baylor College of Medicine, 2007) (See Appendix D).

At the first session the parent of each participating child would be given a Family Starter Kit which would be developed by the first week and include information on getting started (i.e., goal setting and self-efficacy), changing behaviors, charting and monitoring goals, having fun working toward health goals, sharing ideas and opinions about food and physical exercise, and practicing health basics (i.e., eating from the five food groups, lowering fat, reading food labels and decreasing sedentary activity). The packet of materials would include forms for self-monitoring of progress toward goals (See Appendix A for Goal setting forms) and a self-efficacy survey (See Appendix C), which are to be completed by the second session and again at the last. All forms would be written in simple language that most 10- to 12-year-olds can understand (as determined by a Flesch–Kincaid Grade Level score of 6) and have been enhanced with illustrations and visual aids designed to appeal to a young person. All participants would be told that they need to wear appropriate attire at each session, this includes loose fitting clothes; T-shirts and either shorts, or stretchy pants, tennis shoes, but no jeans or sandals. Also at the first session participants would be timed during their 0.25mile run/walk. They would also be timed when the mileage point increases to one mile and at the very last session. This should help to gage progress and evaluate the participant’s endurance over the duration of the program.

By the next session each parent and child would be expected to have filled out the self-efficacy survey (See Appendix D), and identify two personal goals and together two
family goals, as well as writing down their current and past exercise and dietary habits. Goal-setting is an approach that helps people sort through their values and priorities, set goals that are measurable, realistic and desirable, and helps them commit to change. Discussion of these goals should help other participants and the staff members get a sense of each family’s and individual’s priorities, what their experiences and perceptions are, and will show their perceived barriers to health behavior change. The goals would be shared with the group so that participants can voice their goals more concretely and gain support from their peers. Each person should interact and influence everyone else. It is crucial that everyone would be aware of the goals and visions so that everyone can share ideas to create teamwork and cohesiveness. Participants would be encouraged to post their goals at home so they can visualize them each day.

The twelve week time frame was chosen to allow the children and their parents have time to adapt to making exercise a healthy choice habit. According to Merrill (2007) six weeks allows for major behavior changes to start and according to Burgess, Grogan & Burwitz (2006) self efficacy will begin to increase after a six week intervention, but reflections of these changes (e.g., decrease of BMI and lowering of BP) don’t seem to be at their peak till six months (Merrill). A twelve week time frame was selected because if major behavior and self efficacy changes are beginning to peak around six week, a twelve week program should provide more behavior change maintenance and a more likely hood the participants will continue on with those changes long-term. The twelve week period is also short enough to not be perceived as a too much of a commitment to the participants. The more till the children are exposed to an activity the greater chance they will perform
it well, the more they perform an activity well and get positive feedback and praise, the higher the self efficacy; the higher the self efficacy, the more chances the children have of repeating the behavior (Pender, 1996). At second session the whole group would be broken up into two teams of six children and at least one parent per child and would remain in that same group till the end of the twelve weeks. The teams would be chosen by the staff for the participants. The teams would participate in activities both mentally and physically challenging to foster development of trust, social skills, endurance and self confidence. Each day the program met participants would be assigned the rotating roles of group leader, equipment manager, encouragement leader and feedback facilitator. The group leader should make sure the group in on task and maintains direction. The equipment manager should get and put away equipment such as balls, bats, mats or steps if needed for the group members. The encouragement leader should provide and initiate encouragement for anyone who is struggling and will get other team members to do the same. The feedback facilitator should give constructive positive feedback to all the group members through out the two hour session. The different roles should allow the teams to be self-managed. The teamwork mechanism should help aid in the encouragement of others, building self esteem, and creating leadership skills. Youth who feel supported by their peers have a better health related quality of life, specifically as it relates to physical and social functioning (Zeller & Modi, 2006). The probability of future involvement is higher for participants in enriched group environments (Fox, Rejeski, & Gauvin, 2000), making the team approach crucial to attain the program’s goals.
Each session would begin with a five minute stretch and warm up. The stretches would include quadriceps and hamstring flexion and extension, abduction and adduction of the legs and IT band extension. Warm up would include ten to twenty push-ups, participants would be given the options of knees or toes, and the degree of their stance will vary by strength. Warm ups would also include sit ups, ten to thirty, varying by strength and endurance and by weeks. After the warm up and stretch, participants would run approximately 15-25 minutes depending on the length of the run. The running portion would begin short and increase in length over the weeks. If a parent or child cannot run, they can walk and still build endurance and mileage. Running should only take up the first half hour of the two hour session. The team would accumulate mileage over the weeks and at the end of the program, they would have run a marathon (26.2 miles) and would receive medals for their achievements. There would be a specific topic covered each session, followed by an interactive game time so the children would be able to apply the information they just learned (See Appendix B for examples of topics and how sessions will run for the first three weeks). The educational and game session should last for about an hour and twenty minutes followed by a ten minute wrap-up session, which would focus on the group’s achievements on the marathon mileage board. The Marathon mileage board would allow the participants to visualize their achievements, and look forward to in the next session. Team members would be required to give positive feedback to one another to increase comfort levels within the group and enhance their own practice giving and receiving positive feedback. This should help increase self
efficacy with encouragement and self-mastery; a support system would be built with and among families and peers.

One activity during the first week, second session would be an exercise called “Moonball”. This would be implemented into the pilot program to make the concept of goal setting understandable to the child participants (adapted from Schoel & Maizell, 2002). In this game, the participants would stand in a circle and given a large ball. They would be told that their objective is to keep the ball moving, but must prevent the ball from touching the ground. Participants would be encouraged to act out their given role, and within their role they would try different strategies and use the various components of goal setting to help them achieve their objective. Familiar concepts and terms would be used to lead them through this process, such as the idea of a game plan. The participants should develop a game plan of their own and a method of monitoring their progress during the activity. Should the team’s initial plan not allow them to reach their objective, the feedback facilitator should encourage problem solving. The collaborative nature of this activity should engage the teams, improve performance, promote problem solving and encourage participants to support each other.

During the first three weeks the physical activity emphasis would be on demonstrating mastery of fundamental motor, non-locomotor, and manipulative skills, and understanding fundamental principles of movement. Fundamental motor skills are movement patterns including kicking, striking, overhand throwing, running, and vertical jumping and will be promoted with activities such as jump the river, kick ball, dodge-ball and an obstacle course. Non-locomotor skills enhance range of motion, flexibility and
balance and can be demonstrated by bending, lifting, stretching, twisting and curling. 

Being able to perform fundamental motor and non-locomotor movement patterns successfully will increase self-confidence for more complex physical activities that would be introduced in later weeks and would require more skilled movement patterns. 

Participants should understand principles of movement, the effects of activity on the body, the risks associated with inactivity, and the basic components of health-related fitness (cardiovascular, muscle strength, muscle endurance, flexibility, and body composition) through lesson given during stretching and warm times, education sessions, and game times. Both parents and children should understand the importance of nutritious food, how it will contribute to their health, how to read food labels, and how to make simple nutritious food choices.

During the fourth through seventh week the author intends the focus to continue to enhance the participants’ endurance and flexibility through increased mileage each week and more complex physical activities. The physical activities chosen for these four weeks would be everyday sports that are offered as interscholastic activities at school including basketball, baseball, volleyball and soccer. Each sport would be played all three days of that given week, and a coach for that particular sport would come all three days that week to educate the participants and strengthen their skills. Fun games and drills would be formulated around the particular sport, not just playing the actual sports alone. Education times would have a focus for each week as well. The topics that would be covered during these weeks will include diabetes, cardiovascular health, respiratory problems and psychosocial health. A specialist who is trained on the topic of choice for
the week would participate in all three sessions that week. This should allow these complex topics to be broken up into small pieces for easy comprehension, and to fit the time frame allotted. Team game times would address information from previous sessions as well as the current session. During the seventh week the teams would review their individual and family goals. If these goals are not on their way to being met, the team would have a problem solving session with that individual, and a plan would be formulated to help them meet their goal. If the individual has reprioritized and no longer wants to reach that particular goal, the current goal should be revised to meet their new needs.

During the eighth through the twelfth weeks education times would focus on body mechanics, teasing, self-esteem, role modeling, and perceived barriers. During these weeks the participants would get the chance to be involved in activities that are non-traditional sports including yoga/pilates, cardio kick-boxing, hip-hop aerobics, pli-o-metric aerobics and tai-chi. These non-traditional physical activities combine all of the fundamental motor skills but on a whole new intense level. During these sessions the teams could be pushed harder than in the first seven weeks because they should be able to withstand more physical exertion, and it would be beneficial for the participant to see how hard they can push themselves. This would test limits and should decrease perceived barriers of ability. The teams should be cohesive at this point and teammates should trust one another to provide the encouragement needed to push the team through an exercise. During the eleventh week the teams would be allowed to choose a sports or non-
traditional activity that they liked over another and those would be the physical activities used during the first two session of the twelfth week.

The very last session of the twelve weeks would be marathon medal day when participants should complete their last two miles of the marathon, attend an awards ceremony, and take part in a follow up session addressing all they learned during the twelve week course. Participants would also have their BMIs reassessed using the Baylor College of Medicine BMI calculator and the self-efficacy survey would be completed once more. Members of the community, both general and athletic, would be invited to the medal day to offer support and information to further help the children achieve better fitness. By including public support and leaders from local sports teams and recreational activities, the children and parents would have the resources and information to continue some of the activities they found enjoyable during the program. If parents and children have members of the community and sports teams encouraging them, they not only have new resources available, but would an increased comfort level with those individuals due to previous prolonged contact. Providing local resources should increase the chances of participants continuing their life-long lifestyle behavior change.

To decrease the member drop-out rate there would be check ups over the phone every three weeks. These phone calls would be made by a staff member to all the parent participants to find out if there are any barriers to their and their child’s participation and if they are enjoying the program. Getting this feedback throughout the program could allow changes to be made to the curriculum to enhance satisfaction and decrease member drop-out. A log of the barriers, pros and cons and any changes made to the program,
would be disseminated by the staff member to the Marathoner’s Program director to allow for evaluation at the end of the program.

Summary

The Marathoners Program designed by this author would address childhood obesity, and accentuate why and how physical activity should be a part of our everyday routine. Children ten to thirteen years old with their parent or guardian should acquire a large body of experience and knowledge from community professionals about healthy nutrition, physical fitness, body mechanics, and various risk factors such as diabetes making them more confident in their daily choices of food and fitness. They should be able to demonstrate and assess their fitness by performing exercises or activities related to each health-related fitness component. Participation in this strictly voluntary organized physical activity program should improve the participant’s motor skills, which should increase their level of physical activity enjoyment and confidence. Improving children's skills in and enjoyment of physical activity would provide them with alternatives to sedentary behaviors. The more physical activity that takes place in the participants’ everyday lives, the more likely they are going to be able to lose weight, maintain a healthy weight, and remain free from physical and psychological risk factors for obesity. The participants should understand this relationship between physical activity and individual well being, and should help create physical activity participation throughout their lifespan. Overall, parents involved in this intervention program would learn to become advocates and role models not only at home for their children but within their communities.
Feasibility Study Evaluation

The purpose of this chapter is to discuss the evaluation of the proposed feasibility study, the significance of this project as a whole, the Marathoners Program strengths, its limitation, and recommendations for future research. The Marathoners Program aims to build endurance, decrease BMI, increase self-efficacy toward physical activity and healthy eating, and make long-term lifestyle behavior changes. An evaluation would be indicated to assess overall outcomes of the feasibility study.

To test the growth of the participant’s endurance the staff members would measure each individual’s times at the beginning and end of the weeks in which the 0.25 mile, 1 mile and 2 miles run/walks would be completed. Each participant would have a BMI recorded during their individual intake medical evaluation and at the Marathon Medal day. An increase in self-efficacy would be gauged by a survey that would be given out at the first session and would again be completed at the last session (See appendix D). This survey should evaluate the individuals’ confidence about participating in physical activity, as well as their confidence in making healthy food choices. To identify long-term impact of the program, children and parents will be surveyed at three months and nine months after program completion to identify if their activity level has increased or decreased, and whether self-efficacy has changed.

The aim of the proposed feasibility study would be to measure the possibility of implementation, and child and parent participation on a larger scale. To have a successful program, it must have good attendance and a high satisfaction rating among the
participants. To evaluate this participant attendance would be recorded at each session and the participant dropout rate will be reviewed. An attempt to keep participant dropout rate low would be initiated with three week follow up calls by staff members. Parent and child satisfaction would be assessed by using an appropriate, anonymous 14-item questionnaire adapted from the post intervention Client Satisfaction Questionnaire (CSQ) of the Triple P program (Bor, Sanders & Markie-Dadds, 2002) (See Appendix E). The 14-item CSQ would address the quality of service provided; how well the program met the parents', familys' and childs' needs, increased the parents' and childs' skills, and decreased the parent's and child's problem behaviors; and whether the parent or child would recommend the program to others. The measure would derive a composite score of program satisfaction ratings on the Likert 5-point scale. For the Marathoners program adaptations would include tailoring questions to lifestyle modification and weight rather than a general child behavior management program and language would be modified for children so that it is comprehensible (See Appendix F). Additional questions about perceived barriers to program attendance and implementation would also be included.

Significance of the Project

This project is the first step in addressing childhood obesity in a family-based multi-factorial approach that is working toward creating long-term change. This program could provide new information to fill in the gap of knowledge to why interventions have not been producing significant long term change. Results would give not only self-reported data but observational and objective as well making the evidence more substantial. Thereby addressing this gap this program could be the beginning of changing
intervention approaches to come at an individual and community level. A feasibility study of the Marathoners Program could lead to a full study which would hopefully address the nationwide need for childhood obesity intervention that can create long term change. This program would involve consistent contact with children and their parents who are either overweight or are at risk, attempt to influence their diet and exercise behaviors, and increase family interactions, self-efficacy, and the limitation of perceived barriers to future activity. With the proper knowledge and fundamental skills these children and parents could prevent further development of obesity and obesity related health complications throughout their lifetime. This project takes a theoretical approach to an intervention of childhood obesity prevention, to demonstrate how theory and practice could together and be successful. The intention of this project was not merely to give content of the program with rationale, but to provide justification for a unique family-based program. The potential success of this intervention program can further guide other childhood obesity intervention curricula with the theoretical concepts provided and discussed at length in this project. It follows that the more successful obesity prevention programs become available, the slower the progression of the obesity epidemic that has surged over the past twenty years. This project advocates for children and their families to be united in their fight against obesity, and could potentially influence policies that influence diet and physical activity habits for children. This project may lead to further inquiry and research that examines the effect of such an intervention on healthcare outcomes and thereby strengthen the evidence for theoretical family-based obesity prevention programs.
Much of the strength of the Marathoners program comes from the theoretical underpinnings that helped in designing the program’s major concepts. This program’s model utilizes the concepts of stages and processes of change, self-efficacy and health promotion in a format allowing for the program to facilitate behavior change for its target population. The Marathoner program takes a positive self-affirming approach to enhancing healthy behaviors. There would be no negative connotations associated with this program and intended to allow participants a positively identification with the program. This program could be applied in various settings, to all ages, and to all ethnic groups. This program would start at an individual level and broaden toward family and can possible work on a community level. The program would be fairly inexpensive to run and there is a limited amount of equipment needed weekly. The program would take place over a twelve week period of time allowing for new physical and dietary patterns to take place and become more permanent in everyday life. The author intended for participants to make change in small increments and over a longer period of time to allow participants to be less overwhelmed with the transformation. The amount of extended time the participants would get to take part in this program would make a good case for the possibility of long-term behavior change. The Marathoners Program was designed for children and parents, and strategies would used to tailor it to the cognitive–developmental level and interests of the target group for greater understanding. This would be a multi-factorial program that focuses not only on diet and physical activity but behaviors and family lifestyle. By addressing these individuals more holistically there should be fewer barriers to action and the participants should have the tools to continue
their lifestyle changes. The author has build flexibility into the program’s design to allow for the model to be altered for the purpose of meeting all of the participants’ needs. This flexibility also allows this program to be able to be used for various reasons and types of groups such as health, sports or community groups.

Limitations of the Program

Major limitations to implementing this childhood obesity prevention program may include parental attitudes, child attitudes, commitment, and the American sedentary lifestyle. If parents refuse to participate due to possible time restraints, family responsibilities, or attitudes toward behavior change programs, the child will not get the opportunity to participate. This may make recruitment difficult for the feasibility study because a large commitment from children and parents would be required. It may lack appeal to the children and families that are highly predisposed to being physically inactive, or suffer from obesity and medical conditions, because of previous negative experiences. Potentially there could be a low number of applicants applying for the program and the individuals that do apply may not fit the preferred selection criteria. Participants would still have to be chosen, fitting the criteria or not and there would be a possibility that this would limit the generalizability of results to the overweight and obese population. Past research has shown low compliance and a very high drop-out rate in the treatment of the pediatric population (Breat, Tanghe, Brode Franckx & Winckle, 2003). However, it has been shown by a group of researchers that periodical telephone calls can greatly reduce the drop-out percentage (2 out of 85 children) (Breat et al., 2003). During the Marathoners program there would be follow up calls made every three weeks to aid in
the drop-out rate reduction, but a high drop out rate could potentially limit this program. Also it may be difficult to follow and evaluate the children and parents over the next nine months after completion due to relocation, loss of contact information, or loss of priority. The surveys that would be used for the self-efficacy and client satisfaction evaluation have been either created or modified by the author and have not been tested for validity and reliability. The surveys would need to be tested before further use. Although this program would be of low cost to the participants it may pose financial burden on the non-profit organization. Resources such as volunteers, guest speakers and equipment may be limited and cause strain as well.

Suggestions for Future Research

Through the identification of the obesity epidemic researchers have been encouraged to explore causes of obesity, complications, risk factors, and adult treatment and prevention. There have been minimal studies involving the participation of children and family members as a cohort. Current obesity treatment programs have demonstrated little efficacy and no long term change. Overall, preventative interventions specifically focusing on the effectiveness of behavioral and lifestyle modifications programs for children and parents should be further evaluated. Researchers also may examine the affects of this type of program on and, its applicability to younger and to older adults across the lifespan. Using the idea of the CHIP study (2007) an alumni program could be added to the Marathoners program which would provide a monthly newsletter that contains news of health-promoting community events, such as healthy dinners, walking groups, and support-group meetings to those who joined (Merrill, 2007) and be evaluated.
for further positive effect on long term behavior change. The Marathoners Program could be approached in the same manner but translated in to Spanish and promoted to children and parents that are primarily Spanish speakers to test its feasibility and look at cultural changes that may need to be made.

Conclusion

Childhood obesity has been linked to genetic and endogenous factors but environment and societal influences are likely to be greater contributors to the surge in obesity prevalence. A child’s home environment is the environment in which they are exposed to most often and is the one that shapes their opinions. Creating healthy behavior changes within the children’s homes and among their role models, their parents, children will be more likely to practice physically active lifestyles. Children and parents who have adopted the lifestyle modifications portrayed in the Marathoners self affirming program will have a greater self confidence, an increase in physical activity, a healthy well-rounded diet and will be role models and leaders to their peers-relentlessly moving forward, fierce, committed, and strong, Marathoners.
APPENDIX A

Family Goal Setting Form

We, the __________________ family, because we value health, are going to do

(name)

________________________ for __________________, __________________, __________________,

(what) (how much) (when)

and __________________. We will monitor our progress by __________________. We will

(how often) (method)

reward ourselves with __________________. If we find ourselves getting off track, we will

(reward)

________________________.

(how to get ourselves “unstuck”)

Example:

We, the John family, because we value health, are going to do a walk around the block
two times, after dinner, for 4 days per week. We will monitor our progress by charting it
on a calendar. We will reward ourselves with a weekend fishing trip if we stick to our
plan for 6 weeks. If we find ourselves getting off track, we will come together to identify
the barriers to our success and we will problem-solve around these barriers.

(Beckman, Hawley & Bishop, 2006)
APPENDIX B
Sample of Weeks 1-3
<table>
<thead>
<tr>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Session 1</strong></td>
<td><strong>Session 4</strong></td>
<td><strong>Session 5</strong></td>
</tr>
<tr>
<td>Introduction to Marathoners program and Staff</td>
<td>Assignment of roles, discuss safety and stretching with warm up</td>
<td>Role Distribution</td>
</tr>
<tr>
<td>Introduction of participants</td>
<td>Stretch and run/walk 0.5miles</td>
<td>Stretch and run/walk 0.75miles</td>
</tr>
<tr>
<td>Family Starter Kit distribution and discussion. Description of Mileage board</td>
<td>Guest speaker (physician) Discussion about behaviors such as food selection, exercise, and rest affect on growth and development</td>
<td>Guest speaker- Basic components of health-related fitness (cardiovascular, muscle strength, and endurance)</td>
</tr>
<tr>
<td>Basic components of health-related fitness</td>
<td>Team game on ways to be active</td>
<td>Team game on cardiovascular exercises</td>
</tr>
<tr>
<td>Stretch/ warm up introduction and first run/walk. 0.25miles</td>
<td>Dodge ball focus on three loco motor skills (running, throwing, catching and ducking)</td>
<td>Gold rush game working on running and balance. Increasing cardiovascular endurance</td>
</tr>
<tr>
<td>Wrap session and feedback</td>
<td>Wrap up/feedback and mileage board</td>
<td>Wrap up/feedback and mileage board</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Session 2</th>
<th>Session 5</th>
<th>Session 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Break group up into two teams. Discuss team concept</td>
<td>Role Distribution</td>
<td>Role Distribution</td>
</tr>
<tr>
<td>Introduction of rotating roles and distribution</td>
<td>Stretch and Run/walk 0.5miles, continue edu. On proper tech.</td>
<td>Stretch and run/walk 0.75miles, continue proper technique with partner stretch</td>
</tr>
<tr>
<td>Stretch/warm up and run/walk 0.25miles, names of stretches</td>
<td>Dietician guest speaker- topic reading food labels</td>
<td>Guest speaker- Basic components of health-related fitness (Flexibility, and body composition)</td>
</tr>
<tr>
<td>Discussion of goals individual/family and team goals</td>
<td>Team game with food pyramid</td>
<td>Team game on flexibility</td>
</tr>
<tr>
<td>Moon ball game</td>
<td>Jump the river game (running and vertical jumping)</td>
<td>Obstacle coarse game combining loco motor and object control skills</td>
</tr>
<tr>
<td>Wrap up session and feedback. Keep log of time spent in sedentary/active behaviors. Bring log next session.</td>
<td>Wrap up/feedback and mileage board</td>
<td>Wrap up/feedback and mileage board</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Session 3</th>
<th>Session 6</th>
<th>Session 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role Distribution</td>
<td>Role Distribution</td>
<td>Role Distribution</td>
</tr>
<tr>
<td>Stretch and run/walk 0.25miles, names on stretches, proper alignment</td>
<td>Stretch/ warm up and run/walk 0.50miles, identifying muscle group w/ stretch</td>
<td>Stretch/ warm up and run/walk 0.75miles, identifying muscle group w/ stretch</td>
</tr>
<tr>
<td>Weighing up the positives and negatives of choosing between being active or sedentary</td>
<td>Team game emphasizing portion control</td>
<td>Team game: Jeopardy of information given over past three weeks</td>
</tr>
<tr>
<td>Kick ball game-focus on three object control skills (overhand throw, kick and strike)</td>
<td>Dodge ball/jump the river combo (running, vertical jumping, throwing, catching and ducking)</td>
<td>Same obstacle coarse game but with team problem solving and collaboration prior to execution for better results</td>
</tr>
<tr>
<td>Wrap up/feedback and mileage board</td>
<td>Wrap up/feedback, mileage board and re-voice individual goals.</td>
<td>Wrap up/feedback and mileage board</td>
</tr>
</tbody>
</table>
APPENDIX C

Survey to measure self-efficacy of physical activity and healthy eating in participants

Physical Activity and Healthy Eating Survey

Circle the best answer to each question
A. How sure are you that you can be physically active everyday?


B. How sure are you that you can be physically active three days a week?


C. How sure are you that you can chose healthy foods to eat everyday?


D. How sure are you that you will chose healthy foods to eat at each meal?


**Fill in the blank**

**List two physical activities you like to do at least once a week.**

_______________________                                   ________________________

**List two healthy foods you eat at least once a week.**

_______________________                                   ________________________

(Likert, 1932)

Appendix D

Children's BMI-percentile-for-age Calculator
Girls

This girl’s BMI-for-age is staying stable with age, suggesting her weight gains have been healthy.

The red dot represents your child’s BMI percentile.

(Baylor College of Medicine, 2007)
The Marathoners Program thanks you for participation in this satisfaction survey. Your opinions are valued and important to us.

Please circle the best answer

1. The staff members worked together to help me reach my personal goals.
   A. Strongly disagree   B. Disagree   C. Neither agree nor disagree   D. Agree   E. Strongly agree

2. I feel more confident in my personal goal setting skills.
   A. Strongly disagree   B. Disagree   C. Neither agree nor disagree   D. Agree   E. Strongly agree

3. I was satisfied with the scheduling of the sessions each week.
   A. Strongly disagree   B. Disagree   C. Neither agree nor disagree   D. Agree   E. Strongly agree

4. I feel as if I better understand my child’s needs.
   A. Strongly disagree   B. Disagree   C. Neither agree nor disagree   D. Agree   E. Strongly agree

5. I feel as if I better understand my family’s needs.
   A. Strongly disagree   B. Disagree   C. Neither agree nor disagree   D. Agree   E. Strongly agree

6. I am satisfied with the amount of time I spent with the staff members.
   A. Strongly disagree   B. Disagree   C. Neither agree nor disagree   D. Agree   E. Strongly agree

7. I feel as if I have the appropriate resources to continue my physical activity on a daily basis.
   A. Strongly disagree   B. Disagree   C. Neither agree nor disagree   D. Agree   E. Strongly agree

8. I feel I have decreased the problems behaviors that contributed to being sedentary.
   A. Strongly disagree   B. Disagree   C. Neither agree nor disagree   D. Agree   E. Strongly agree

9. I feel I have decreased the problem behaviors that contributed to unhealthy eating.
   A. Strongly disagree   B. Disagree   C. Neither agree nor disagree   D. Agree   E. Strongly agree

10. I feel this program met my needs.
A. Strongly disagree   B. Disagree   C. Neither agree nor disagree    D. Agree   E. Strongly agree

11. The program information was relevant and educational.
A. Strongly disagree   B. Disagree   C. Neither agree nor disagree    D. Agree   E. Strongly agree

12. The information provided understandable.
A. Strongly disagree   B. Disagree   C. Neither agree nor disagree    D. Agree   E. Strongly agree

13. Overall I was satisfied with my experience.
A. Strongly disagree   B. Disagree   C. Neither agree nor disagree    D. Agree   E. Strongly agree

14. I would recommend this program to someone else.
A. Strongly disagree   B. Disagree   C. Neither agree nor disagree    D. Agree   E. Strongly agree

(Bor, Sanders & Markie-Dadds, 2002)

(Likert, 1932)
Child Satisfaction Survey

The Marathoners Program thanks you for participation in this satisfaction survey. Your answers are important to us.

Please circle the best answer

15. The staff members worked together to help me reach my goals.
   A. Strongly disagree  B. Disagree  C. Neither agree nor disagree  D. Agree  E. Strongly agree

16. I feel good about my goal setting skills.
   A. Strongly disagree  B. Disagree  C. Neither agree nor disagree  D. Agree  E. Strongly agree

17. I am happy with the days and times the program met each week.
   A. Strongly disagree  B. Disagree  C. Neither agree nor disagree  D. Agree  E. Strongly agree

18. I feel as if I better understand my needs.
   A. Strongly disagree  B. Disagree  C. Neither agree nor disagree  D. Agree  E. Strongly agree

19. I feel as if I better understand my family’s needs.
   A. Strongly disagree  B. Disagree  C. Neither agree nor disagree  D. Agree  E. Strongly agree

20. I feel that I spent enough time with the staff members.
   A. Strongly disagree  B. Disagree  C. Neither agree nor disagree  D. Agree  E. Strongly agree

21. I feel as if I have people that can help me continue my physical activity daily.
   A. Strongly disagree  B. Disagree  C. Neither agree nor disagree  D. Agree  E. Strongly agree

22. I feel I watch t.v. and play video games less often.
   A. Strongly disagree  B. Disagree  C. Neither agree nor disagree  D. Agree  E. Strongly agree

23. I feel I am eating more foods that are good for me at each meal.
   A. Strongly disagree  B. Disagree  C. Neither agree nor disagree  D. Agree  E. Strongly agree

24. I feel this program was helpful.
   A. Strongly disagree  B. Disagree  C. Neither agree nor disagree  D. Agree  E. Strongly agree
25. The information provided at each session was helpful.
A. Strongly disagree  B. Disagree  C. Neither agree nor disagree  D. Agree  E. Strongly agree

26. I feel I knew what was being said most of the time.
A. Strongly disagree  B. Disagree  C. Neither agree nor disagree  D. Agree  E. Strongly agree

27. Overall I was happy with my experience.
A. Strongly disagree  B. Disagree  C. Neither agree nor disagree  D. Agree  E. Strongly agree

28. I would tell someone else to come to this program.
A. Strongly disagree  B. Disagree  C. Neither agree nor disagree  D. Agree  E. Strongly agree

(Bor, Sanders & Markie-Dadds, 2002).

(Likert, 1932)


National Center of Chronic Disease Prevention and Health Promotion (2000, Sep.). Setting the agenda, CDC Research in Chronic Disease Prevention and Health Promotion, Atlanta Centers for Disease Control and Prevention.


(NHANES) National Health and Nutrition Examination Survey 1999–2000


