Behavioral and Healthy Lifestyle Changes after Implementation of a Walking Program among Teachers at an Elementary School

Sara Woolfolk

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BEHAVIORAL AND HEALTHY LIFESTYLE CHANGES AFTER IMPLEMENTATION OF A WALKING PROGRAM AMONG TEACHERS AT AN ELEMENTARY SCHOOL

By

Sara Rebecca Woolfolk

A Thesis
Submitted to the Faculty of Mississippi State University in Partial Fulfillment of the Requirements for the Degree of Master of Science in Food Science, Nutrition, and Health Promotion with a Concentration in Nutrition in the Department of Food Science, Nutrition, and Health Promotion

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BEHAVIORAL AND HEALTHY LIFESTYLE CHANGES AFTER
IMPLEMENTATION OF A WALKING PROGRAM AMONG
TEACHERS AT AN ELEMENTARY SCHOOL

By

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Health experts are recommending an average of 10,000 steps daily to attain certain health benefits and suggesting the use of pedometers for calculating ambulatory activity, such as walking. A 13-week, worksite walking program was implemented with teachers at an elementary school providing pedometers, weekly walking groups, bimonthly supplemental nutrition information, and a survey upon program completion to evaluate the effectiveness. Results showed that of the 31.3% that participated, 93.6% have tried to increase their daily activity in the past and 58.1% found the Bee Active walking program to be more effective than previous attempts. Participants reported that wearing the pedometer helped motivate more physical activity and increase total daily steps taken. For non-participants (63.6%), schedule conflicts and lack of time were the top two participation barriers. As a result of providing the bimonthly nutritional information, both participants and non-participants have attempted to make healthier food choices, while increasing their daily consumption of fruits and vegetables significantly.
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CHAPTER I
INTRODUCTION

Vice Admiral Richard H. Carmona, U.S. Surgeon General stated “As a society, we can no longer afford to make poor health choices such as being physically inactive and eating an unhealthy diet; these choices have led to a tremendous obesity epidemic. As policy makers and health professionals, we must embrace small steps toward coordinated policy and environmental changes that will help Americans live longer, better healthier lives” (U.S Department of Health and Human Services [U.S. DHHS] and Centers for Disease Control and Prevention [CDC], 2005). One of the most predominant contributors to mortality in the United States in 1990 was diet and activity patterns (McGinnis and Foege, 1993). Overweight and obesity among American adults has become the top threat to the health of this nation (U.S. Department of Health and Human Services [U.S. DHHS], 2003).

Since 1980, the prevalence of overweight and obesity has doubled with 65% of Americans considered overweight and 30% considered obese (U.S. DHHS & USDA, 2005; U.S. DHHS & CDC, 2005; U.S. DHHS, 2003). In the past 20 years, childhood overweight has doubled. Sixteen percent (16%) of children and adolescents from 6-19 years of age are considered overweight (U.S. DHHS & CDC, 2005). While obesity can
be due to some genetic identifiers, much is caused from unhealthy diets and physical inactivity (U.S. DHHS, 2003).

Weight gain occurs from an imbalance between calories consumed and calories expended by an individual (U.S. DHHS, 2003). As weight gain and body fatness continue to increase, so does the risk of developing chronic diseases. By choosing a diet filled with nutritious foods and becoming physically active daily, Americans can decrease the rate of overweight and obesity and lower the rate of chronic diseases (U.S. DHHS & USDA, 2005; U.S. DHHS & CDC, 2005).

Eating habits can contribute to an individual’s risk for developing chronic diseases. Research concludes that by choosing healthy foods over non-nutritious foods can lower the risk of certain diseases such as diabetes, heart disease, stroke, certain cancers, and osteoporosis (U.S. DHHS & CDC, 2005). The *Dietary Guidelines for Americans* 2005 is targeted towards all Americans age 2 years and older. These guidelines provide health recommendations concerning eating patterns and physical activity (U.S. DHHS & USDA, 2005).

The *Dietary Guidelines for Americans* 2005 recommends a diet in which a variety of foods are included from each food group in order to provide nutrients needed for good health. The new MyPyramid offers guidance to aid Americans in implementation of the *Dietary Guidelines*. MyPyramid encourages consuming a diet with lower intakes of saturated fats, trans fats, and cholesterol while increasing the consumption of fruits,
vegetables, whole grains, and low-fat milk products to decrease risk for some chronic diseases (U.S. Department of Agriculture [USDA], 2006).

Common barriers often prevent individuals from consuming an adequate diet. Lack of time, reluctance to give up favorite foods, lack of willpower, and the expense of healthy eating have been reported as barriers in preventing Americans from eating healthy (Lappalainen and Saba et al., 1997). Many suffer from not having access to a good diet and adequate food supply, which can lead to malnutrition and health deficiencies.

Good eating habits are not the only contributor to good health. Daily physical activity has been shown to improve the health and quality of life for individuals of all ages. According to the CDC, “more than 50% of American adults do not get enough physical activity to provide health benefits, and 25% of adults are not active at all in their leisure time” (Centers for Disease Control and Prevention [CDC], 2005).

Regular physical activity can reduce the risk of developing hypertension, diabetes, colon cancer, and heart attacks. Not only does physical activity enhance mental health, but also contributes to fewer physician visits, hospitalizations, and medications (U.S. Department of Health and Human Services [U.S. DHHS], 1999; U.S. DHHS & CDC, 2005). Research has reported that with daily physical activity, individuals can reduce total cholesterol, decrease risk for coronary heart disease, and promote lower BMI in some individuals (Nies, Chruscial, and Hepworth, 2003; Walker, Piers, Putt, Jones, and O’Dea, 1999).
Despite the evidence, individuals are still not engaging in the recommended daily amount of 30 minutes of moderate intensity physical activity to reduce risk of chronic diseases (U.S. DHHS & USDA, 2005). Health experts are now recommending a goal of 10,000 steps a day or more to reap health benefits (Tuft’s University Health and Nutrition Letter, 2002). Individuals may be intimidated by the total number of steps recommended daily, but most can acquire the goal by involving themselves in the recommended 30 minutes a day of physical activity (Le Masurier, Sidman, and Corbin, 2003). The 10,000 step goal is very attainable and can be done by most people of all ages and various body sizes (Tudor-Locke & Bassett, 2004).

Pedometers help motivate individuals and aid with tracking the number of daily steps (Schnirring, 2001; Consumer Reports, 2004). These devices are inexpensive, simple tools worn at the waistline that measure ambulatory activity such as walking and running (Croteau, 2004). Walking programs implementing 10,000 steps daily accompanied with the use of a pedometer have reported success with increasing physical activity (Lindberg, 2000). Pedometers are not only a great motivator, but can be used to assist researchers in measuring and accessing walking behaviors (Croteau, 2004; Schneider, Crouter, Lukajic, and Bassett, 2003).

Although studies have proved that increasing daily physical activity is beneficial to an individual’s health, there are still uncertainties as to why individuals continue to be inactive. Obstacles often keep people from becoming involved in daily physical activity. Lack of time, confidence, encouragement, self-management skills, and accommodations such as parks, sidewalks, or safe walking paths are all obstacles an individual may
encounter (Sallis and Hovell, 1990; Sallis, Hovell and Hofstetter, 1992). Once barriers have been identified, individuals must work toward overcoming these challenges and begin involvement in physical activity (CDC, 2005).

Lack of opportunity and social determinants often prevent individuals from becoming physically active though behavior and theory often play a greater role in increasing physical activity. Certain theories have been developed to further understand exercise barriers and behaviors. Public health interventions can help identify behavioral theories and consequently improve the health of Americans (Conn, Tripp-Reimer, and Maas, 2003).

Surrounding communities and social environment can have an impact on involvement in physical activity within a population (CDC, 2005). Since communities come in all sizes and shapes, understanding the distinctive characteristics of a particular community is crucial when planning health interventions. Recognizing a common problem, assembling resources, and developing strategies to reach an overall goal is vital when dealing with health promotion (U.S. Department of Health and Human Services [U.S. DHHS], National Institutes of Health, 2005).

Getting worksites and schools involved in health promotion can be a great way of getting in touch with individuals to promote health and well being (Friends of the Center for Human Nutrition, 2003; Haynes, Dunnagan, and Smith, 1999; Centers for Disease Control and Prevention [CDC], 2005, April). Offering employees sponsored health promotion can reduce absenteeism, medical claims, and short-term disability (Stein, Khoury Shakour, and Zuidema, 2000). Programs often offer the support and motivation
that individuals need in order to begin and maintain regular physical activity (BlueCross
BlueShield of Nebraska, 2003).

Schools have recently become involved in promoting health to not only students,
but staff, parents, families, and the community as well. Good health is crucial to the
growth and development of children and adolescents (U.S. DHHS & USDA, 2005). The
programs offered at schools are committed to being the forerunners of making nutritional
change, providing nutrition education activities and events, and using current
recommendations set by the Dietary Guidelines for Americans 2005 to promote health
(U.S. Department of Agriculture [USDA], (n.d.).

A coordinated school health program (CSHP) is a school based nutrition-related
implementation program that reaches the issue of childhood health promotion by
involving the outside community and social environment and most importantly gathering
staff involvement. Offering health promotion to staff not only improves health status, but
also provides positive role modeling for students. Family and community involvement
along with staff support can promptly identify problems within the school environment
and ultimately develop change to improve childhood health (CDC, 2005, April;
Education Development Center, 2001).

Though recommendations have been made to encourage Americans to eat
healthier, many still over consume foods leading to increased calorie intake. When
eating habits are poor along with physical inactivity, individuals tend to gain weight thus
increasing risks for developing chronic diseases (U.S. DHHS & USDA, 2005).
Communities and schools can help raise awareness by implementing health programs to educate individuals on the benefits of making healthier choices.
Bibliography


CHAPTER II

BEHAVIORAL AND HEALTHY LIFESTYLE CHANGES AFTER IMPLEMENTATION OF A WALKING PROGRAM AMONG TEACHERS AT AN ELEMENTARY SCHOOL

Abstract

Health experts are recommending an average of 10,000 steps daily to attain certain health benefits and suggesting the use of pedometers for calculating ambulatory activity, such as walking. A 13-week, worksite walking program was implemented with teachers at an elementary school providing pedometers, weekly walking groups, bimonthly supplemental nutrition information, and a survey upon program completion to evaluate the effectiveness. Results showed that of the 31.3% that participated, 93.6% have tried to increase their daily activity in the past and 58.1% found the Bee Active walking program to be more effective than previous attempts. Participants reported that wearing the pedometer helped motivate more physical activity and increase total daily steps taken. For non-participants (63.6%), schedule conflicts and lack of time were the top two participation barriers. As a result of providing the bimonthly nutritional information, both participants and non-participants have attempted to make healthier food choices, while increasing their daily consumption of fruits and vegetables significantly.
Introduction

With overweight and obesity reaching epidemic proportions, Americans need to focus on how to promote and maintain a healthy lifestyle. Individuals continue to engage in unhealthy eating patterns and physical inactivity which contributes to weight gain (U.S. DHHS, 1999). Once environmental and social barriers have been identified, effective programs need to be enacted to promote health among individuals and the overall health of the nation (U.S. DHHS, National Institutes of Health, 2005).

A proper diet is vital for health and well being. Over consumption of foods that are not nutritious and lack variety can be dangerous to an individual’s health (U.S. DHHS, National Institutes of Health, 2005). Adequate nutrient intake within calorie needs can be met by eating nutrient dense foods and beverages (U.S. Department of Health and Human Services [U.S. DHHS] and U.S. Department of Agriculture [USDA], 2005). Choosing a variety of foods among each basic food group while limiting saturated fats, trans fat, cholesterol, added sugars, salt, and alcohol can lead an individual to a well balanced diet (USDA, 2006).

Evidence shows that inactive individuals of all ages can improve health and quality of life by becoming physically activity daily (CDC, 2005). Regular physical activity can decrease a person’s chance of developing certain chronic diseases such as hypertension, diabetes, some cancers, and cardiovascular disease. To promote health, the Dietary Guideline for Americans 2005 recommends that adults should engage in 30 minutes of moderate intensity activity on most days of the week (U.S. DHHS & USDA, 2005).
Most recently, health practitioners are recommending 10,000 steps a day to attain health benefits including cardiovascular health (Tuft’s University Health and Nutrition Letter, 2002; Friends of the Center for Human Nutrition, 2003). Studies have shown that by including 30 minutes of moderate activity, such as brisk walking, can help individuals increase steps taken and achieve the goal of 10,000 steps daily (Le Masurier, Sidman, and Corbin, 2003; Tudor-Locke & Bassett, 2004). A good motivator and tool to help track the number of steps taken is a pedometer (Schnirring, 2001; Consumer Reports, 2004). Pedometers are simple, inexpensive devices that are worn at the waistline and count the number of steps taken when worn (Consumer Reports, 2004; Croteau, 2004). Because pedometers are fairly inexpensive and have proved helpful in motivating individuals, many researchers are using pedometers for intervention purposes (Schnirring, 2001; Consumer Reports, 2004). Walking programs that promote 10,000 steps with the use of a pedometer have reported to have an impact of increasing physical activity (Lindberg, 2000; Croteau, 2004).

Barriers such as lack of opportunity, social determinants, and support from family and friends often keep individuals from engaging in physical activity (Garcia Bengoechea, E., 2005; World Health Organization [WHO], 2003). Behavioral theories and change have been developed to help understand exercise behavior (Conn, Tripp-Reimer, and Maas, 2003). Social environment and communities along with the identification of individual behavior and theories can work together to implement physical activity (Conn, Tripp-Reimer, and Maas, 2003).
Organizing community effort through recognizing the common problem, collecting resources, and developing strategies to obtain an overall goal can be vital when implementing a health promotion program (U.S. DHHS, National Institutes of Health, 2005). Community-based intervention programs offered at schools and workplaces have shown success by increasing physical activity (Friends of the Center for Human Nutrition, 2003). These programs often offer the resources and motivation an individual needs in order to begin physical activity (BlueCross BlueShield of Nebraska, 2003).

Employee involvement in physical activity has shown to reduce absenteeism, lower medical care expenditures, and decrease mental health visits (Ozminkowski, et al. 2002; Stein, Khoury Shakour, and Zuidema, 2000). Walking programs are an easy way to get employees involved, because a good pair of shoes with a little motivation is all that walking requires (Women’s Heart Foundation, 2000; National Institute of Diabetes and Digestive and Kidney Disease [NIDDK], 2004). Schools are now offering worksite wellness programs to employees in hope to not only promote good health among the teachers and staff, but this commitment to health is often transferred to the students and establishes effective role modeling (CDC, 2005, April)

Establishing community-based health promotion programs especially at worksites and schools can implement the importance of health by providing nutritious foods and a variety of exercise (Dalton, 2004; U.S. DHHS, National Institutes of Health, 2005). Once determinants of physical activity and unhealthy eating habits have been identified, effective programs need to be placed in order to decrease the rate of overweight and obesity. The effort of understanding how to promote more active, healthy lifestyle is a
tremendous importance to individuals and for the health of the nation (U.S. DHHS, 1999).

**Healthy Eating**

Overweight and obesity often occurs due to unhealthy eating habits and over consumption of calories. Research shows that healthy eating may help lower an individual’s risk of chronic diseases such as diabetes, heart disease, stroke, certain cancers, and osteoporosis. Recommendations and *Dietary Guidelines* have been developed to aid individuals in good eating behaviors, but a gap still exists between what Americans should eat and what Americans actually consume (U.S. DHHS & CDC, 2005).

The *Dietary Guidelines for Americans 2005* have been established by federal nutrition policy to promote health and reduce an individual’s risk for major chronic diseases by means of diet and physical activity (U.S. DHHS & USDA, 2005; USDA, 2006). The *Dietary Guidelines* “provide science-based advice” and “are targeted to the general public over 2 years of age who are living in the United States.” Because the *Dietary Guidelines* are created by the U.S. Department of Health and Human Services (HHS) and the U.S. Department of Agriculture (USDA), the primary focus is health promotion and reduction of health risks. These guidelines are the foundation of federal food, nutrition education, and information programs (U.S. DHHS & USDA, 2005).

Good nutrition becomes necessary for healthy growth and development of young children and adolescents. Major causes of morbidity and mortality in the U.S are the result of poor diet consumption and physical inactivity. Data from 1999-2002 stated that
65% of U.S. adults were overweight, which was an increase of 9% from data obtained between 1988 and 1994. Further research revealed that 30% of adults were obese, which was an increase of 7% based on collected data from earlier surveys (U.S. DHHS & USDA, 2005).

Nutrition status of individuals has switched from nutritional deficiency to over consumption since the beginning of the 20th Century. Due to the problems of food over consumption and imbalances, the links between diet, weight gain, and chronic diseases have become apparent. Research and science-based evidence propose that consuming diets high in total fat, cholesterol, and saturated fat and low in fiber and complex carbohydrates are associated with coronary heart disease, stroke, diabetes, and certain types of cancer (Kennedy, Ohls, Carlson, and Fleming, 1995). McCrory and colleagues (1999) research reinforced the concept of consuming a high variety of sweets, snacks, condiments, entrees and carbohydrates coupled with a low variety of vegetables promotes long term increases in energy intake and body fatness (McCrory and Fuss et al., 1999). Recent reports suggest that consistent dietary patterns along with recommendations were related to a decrease risk of mortality among individuals 45 years of age and older (Kant, Graubard and Schatzkin, 2004). Improving nutrition status of Americans can be achieved through enhancing dietary patterns that will improve the overall health of the public (Kennedy, Ohls, Carlson, and Fleming, 1995).

While some individuals are not concerned with eating healthy, many attempt to eat healthier though barriers often arise. One study reported that lack of time was the most common barrier. Other barriers reported include not wanting to give up favorite
foods, lack of willpower, and the added cost of eating healthy (Lappalainen and Saba et al., 1997). An individual’s access to a good diet with adequate food supply is vital for health and well being. Consuming excessive amounts of food can be dangerous to an individual’s health. Lack of variety and shortage of food can also jeopardize health causing malnutrition and deficiency to occur (U.S. DHHS, National Institutes of Health, 2005).

Adequate nutrient intake within calorie needs can be met by consuming nutrient-dense foods and beverages. Choosing a variety of foods among each basic food group while limiting saturated fats, trans fats, cholesterol, added sugars, salt, and alcohol can lead an individual to a well balanced diet. The USDA’s MyPyramid can lead an individual to consuming a diet that meets personalized nutrient needs.

Since the rise in prevalence of overweight and obesity in the United States, weight management through diet and exercise concerns the health of the nation. The Dietary Guidelines recommends a balance of calories from food and beverages must not exceed calories expended. Increasing physical activity and decreasing small amounts of foods gradually can prevent weight gain over time.

With the development of the new food guide pyramid, MyPyramid offers guidance to help individuals implement the recommendations set by The Dietary Guidelines. This food guidance system translates each food group into a total diet that can aid people in meeting certain nutrient needs while avoiding excess consumption (USDA, 2006). To improve the quality of an average American’s diet, MyPyramid recommends the following: (1) Increase intake of vitamins, minerals, dietary fiber, and
other essential nutrients, especially those often low in a typical diet, (2) lowered intake of saturated fats, trans fats, and cholesterol and increase intake of fruits, vegetables, and whole grains to decrease risk for some chronic diseases, and (3) calorie intake balanced with energy needs to prevent weight gain and/or promote a healthy weight (USDA, 2006).

MyPyramid offers six basic principles that include activity, moderation, personalization, proportionality, variety, and gradual improvement. MyPyramid illustrates activity by steps and the person climbing the chart. Involvement in physical activity daily can be critical for good health. Moderation represents each vertical band, with each band wider at the bottom and becoming narrower at the top. Foods within the wider section would include high nutrient content with reduced fat and low sugar amounts. The narrow top of each band represents foods containing high fat and sugar content with little or no nutrient value. Personalization can occur when age, gender, and physical activity level are taken into consideration to provide a diet that offers optimal health. The width of each food band demonstrates proportionality. The wider the band, the more foods can be consumed. The colors within the pyramid remind individuals to add a variety among all food groups. By making small, but gradual improvements to achieve a successful diet, an individual will ultimately shift to a healthier lifestyle (USDA, 2006).

MyPyramid contains food groups like the previous food guide pyramid that includes grains, vegetables, fruits, milk, meat and beans. Because of the health benefits some oils have shown, oils have been included as a separate group. Depending on age,
gender, and physical activity level, MyPyramid makes recommendations for the number
of servings an individual can consume within each food group to meet certain calorie
needs each day.

Grains pertain to any food made from a grain product. Examples of grain
products include bread, cereal, rice, pasta, and tortillas. Much research has been
developed to support whole grain product consumption to promote health. High intakes
of whole grain products have been linked to a reduced risk of ischemic stroke in women,
cancer (particularly gastrointestinal), and cardiovascular disease (Slavin, Jacobs, and
Marquart, 1997; Liu and Manson, et al., 2000). Though whole grain recommendations
are not specific, higher intakes of whole grain products may be associated with reducing
the risk of certain diseases such as coronary heart disease (Liu and Stampfer et al., 1999).
*The Guidelines* recommend consuming 3 or more servings of whole grain products per
day. Suggestions have also been made that for an individual’s total grain consumption,
50% should be whole grains. Limiting intake of highly refined grain products has also
been recommended (USDA, 2006).

Sufficient amounts and a variety of fruits and vegetables are needed to reap health
benefits (U.S. DHHS & USDA, 2005). Phytochemicals are normally found in fruits and
vegetables that work together with vitamins, minerals, and fiber to promote health.
Studies have shown that phytochemicals can not only act as antioxidants and antibacterial
agents, but also can stimulate immune systems and detoxifying enzymes (U.S.
Department of Health and Human Services [U.S. DHHS], National Institutes of Health,
and National Cancer Institute, n.d.). Two (2) cups of fruit along with 2 ½ cups of
vegetables are recommended daily for individuals with a 2000 calorie intake. Higher or lower amounts are to be consumed depending on calorie needs. Fruits and vegetables provide a variety of micronutrients and fiber and can be found in many different types, forms, and colors (U.S. DHHS & USDA, 2005).

Studies have illustrated that high fruit and vegetable intake can offer protective roles in the prevention of cataract formation, coronary heart disease, chronic obstructive pulmonary disease, diverticulosis, and hypertension (Van Duyn and Pivonka, 2000). Protective roles of fruit and vegetable intake against cancer have also been studied. Block, Patterson, and Subar (1992) reported that with most cancer sites, a lower intake of fruits and vegetables resulted in twice the risk of cancer than with higher intake (Block, Patterson, and Subar, 1992). Many individuals try to increase consumption of fruits and vegetables by following the “5-a-day” program (Centers for Disease Control and Prevention [CDC], 2006).

The CDC and the U.S. Department of Health and Human Services promote the program in hope individuals will increase consumption of fruits and vegetables to reduce the risk of chronic diseases (U.S. DHHS, National Institutes of Health, and National Cancer Institute, n.d.; CDC, 2006). The 5-a-day program encourages children ages 2 to 6 years old to consume a minimum of 5 servings of fruits and vegetables daily. Older children, teenage girls, and active women should consume 7 servings of fruit and vegetables daily. Teenage boys and active men should daily consume at least 9 servings of fruit and vegetables (U.S. DHHS, National Institutes of Health, and National Cancer Institute, n.d.). Much effort has gone into implementing higher consumptions of fruit and
vegetables of children and adolescents. A 5-a-day power plus program was implemented in 20 schools in Minnesota to increase lunchtime fruit and vegetable intake. The program proved to be effective in increasing amounts of fruit and vegetable consumption, but the issue continues to be a challenge (Perry and Bishop et al., 1998). Newmark and colleagues (1996) recognized the need for increased intake of fruit and vegetables, but were concerned with psychosocial factors. Inadequate consumption was common among the population of 7th to 12th graders, but was particularly lower with individuals from a low socioeconomic background (Neumark-Sztainer, Story, Resnick, and Blum, 1996). Optimizing nutrition through increasing fruit and vegetable intake is practical in improving good health and reducing disease risk (Van Duyn and Pivonka, 2000).

The milk group contains all dairy products such as cheese, yogurt, and milk. Low-fat milk choices are recommended instead of high fat products such as whole milk. Consuming 3 cups or more of fat free or low-fat dairy products meet current recommendations. Many individuals do not meet certain milk and dairy recommendations set by the USDA because milk has been replaced with more popular drinks such as soda. Most research focuses on adolescent girls and women and the effects milk consumption has on bone density and osteoporosis. Higher milk consumption during the adolescent years has been associated with greater bone density thereby reducing the incidence of developing osteoporosis (Teegarden and Roseann et al., 1999; Heaney, 2000).

Meat, poultry, fish, dry beans, eggs, and nuts were formerly the name of the Meat and Bean group. Though all foods mentioned above are found within the Meat and Bean
group, focus on lean and low-fat choices is of great importance. Limiting high processed, high fat meats contributes to a healthier diet (USDA, 2006).

Recent research shows that certain oils can be vital for good health. In the past oils were recommended to be used sparingly according to the previous food guide pyramid. MyPyramid recommends the daily consumption of oils found in fish, nuts, and plant sources (USDA, 2006).

Fats found in foods lead to an increase of calories consumed. Individuals should consume less than 10% of calories from saturated fatty acids and less than 300 mg of cholesterol per day. Total fat intake between 20-35% of daily calories should be the goal of each individual. Most fats consumed should come from polyunsaturated and monounsaturated fatty acids such as fish, nuts, and vegetable oils. People are encouraged to limit fats and oils high in saturated fats and trans fat to meet the guidelines (U.S. DHHS & USDA, 2005).

Carbohydrate choices often contain hidden fats and sugars, which can add calories to an individual’s diet. An individual should choose fiber rich fruits, vegetables, and whole grains often to gain nutrients needed to promote health. Restricting beverages and candy high in sugar may reduce the incidence of dental cavities along with good daily oral hygiene (U.S. DHHS & USDA, 2005).

Sodium recommendations have been set for Americans as less than 2,300 mg per day. Choosing and preparing food with little or no salt can help reduce an individual’s intake of sodium. Sodium restriction along with a diet enriched with potassium can help Americans lower blood pressures (U.S. DHHS & USDA, 2005).
Government and federal policy continues to set healthy recommendations for Americans to promote good health. But, knowing how to evaluate if individuals are meeting the recommendations is a tough issue to solve. A useful tool developed to measure overall diet quality that incorporates nutrient needs and guidelines can be referred to as the Healthy Eating Index (HEI). The HEI can serve to measure change in consumption patterns for nutrition promotion. The HEI has 10 components which consider different facets of a healthy diet. Components 1 through 5 compare a person’s diet to the recommendations of the 5 major food groups. Component 6 looks at overall fat consumption as a percentage of total calories consumed. Component 7 measures saturated fat consumption as a percentage of total calories consumed. Component 8 focuses on cholesterol intake. Component 9 observes sodium intake. Component 10 measures the amount of variety in an individual’s diet (Kennedy, Ohls, Carlson, and Fleming, 1995).

When grading the HEI, participants receive a score ranging from 0 to 10 points for each component, thus a total score ranging from 0-100 points. For components 1 through 5, individuals that consume the recommended number of servings from any food receives 10 points for that particular group. Amounts consumed other than those recommended are calculated proportionally. For components 6 through 10, scoring occurs differently than that of components 1 through 5. Total fat intake at 30% or less proportional to energy would receive a 10. But, fat intake of 45% or more would receive a zero. Saturated fat compared to total fat should be 10% or less. A ratio of 15% or greater would result in a score of zero. Components concerning cholesterol and sodium
are set for a perfect 10 at 300 mg for cholesterol and 2,400 mg for sodium. Zero (0) points would be received if 450 mg of cholesterol and 4,800 mg of sodium was consumed (Kennedy, Ohls, Carlson, and Fleming, 1995).

In 1989-1990, a representative sample of the United States’ population was used to analyze HEI. The results were a mean HEI of 63.9. Most people scored neither very high nor very low. No one component of the index dominated the HEI score. Component scores for grains, vegetables, and total fat averaged from 6.1-6.3. The two components which received the highest percentage of receiving a score of zero were saturated fat and fruits. Results also demonstrated that as the total HEI score increased, so did the intake of a range of nutrients. The HEI can provide nutrition based programs a way for monitoring overall diet quality and dietary changes made by the consumer (Kennedy, Ohls, Carlson, and Fleming, 1995).

Though tools have been developed to help guide individuals, many Americans continue to consume excessive amounts of food with little variety. When calories consumed exceed calories expended, weight gain will occur. As a result, the risk of developing a chronic disease increases (U.S. DHHS & USDA, 2005). The Dietary Guidelines for Americans 2005 recommend and encourage individuals to make smart choices from every food group, find a balance between food and physical activity, and get the most nutrition possible out of daily calories to promote good health (U.S. DHHS & USDA, 2005).
Physical Activity

Many Americans strive to become healthy individuals by eating right, but neglect the importance of physical activity. While the number of overweight and obese individuals rises significantly along with physical inactivity, more attention is being reported on the benefits of regular physical activity. Evidence continues to show that inactive people of all ages can improve their health and quality of life by becoming active on a daily basis (CDC, 2005).

According to Centers for Disease Control and Prevention (CDC), physical activity can be defined as “any bodily movement produced by skeletal muscles resulting in energy expenditure,” (http://www.cdc.gov/nccdphp/dnpa/physical/terms/index.htm). Regular physical activity has been shown to reduce the risk of developing hypertension, diabetes, colon cancer, and heart attacks. Physician visits, hospitalizations, and medications are also reduced. Not only does it enhance mental health, but contributes to healthy muscles, bones, and joints (U.S. DHHS, 1999; U.S. DHHS & CDC, 2005).

Regular physical activity can enhance muscular strength, aerobic capacity, metabolic functioning, and body agility and coordination (The Community Guide and Centers for Disease Control and Prevention [CDC], 2005). Recent studies have shown that light to moderate levels of physical activity have been associated with decreased risk of coronary heart disease in women (Nies, Chrusicial, and Hepworth, 2003). One study reported that higher levels of commuting physical activity such as walking, bicycling, and riding on a bus were related to significantly lower rates of colon cancer, while through consistent physical activity over a number of years diminished the risks of colon cancer (Shrier,
Another study observed the relation of cardiovascular disease and body composition in women with type II diabetes and normoglycemic women. After a 12 week walking program, the diabetic women had decreased Body Mass Index (BMI), body fat composition, and fasting blood glucose. Both groups had a decrease in Hemoglobin A1c (HgbA1c), total cholesterol, and low density lipoproteins (LDL) cholesterol, and improved VO2max levels (Walker, Piers, Putt, Jones, and O’Dea, 1999). Individuals with higher physical fitness levels are at a lower risk for developing chronic disease, and have lower mortality rates from all causes of death than sedentary people (U.S. DHHS & USDA, 2005). Despite the evidence, Americans are at their highest weight and still not involved in regular physical activity (CDC, 2005).

According to CDC, “more than 50% of American adults do not get enough physical activity to provide health benefits, and 25% of adults are not active at all in their leisure time” (CDC, 2005). Involvement in physical activity daily has been shown to be less common among women than men, decreasing with age, and less feasible among those of lower income and less education. Individuals that have been sedentary can improve their health and well being by including physical activity each day (CDC, 2005).

In the 1950s, there was a strong emphasis on physical activity and being involved in team sports. Educating Americans about the health benefits associated with vigorous activity and cardiovascular disease was of most interest in the 1970s. The 1980s and 1990s brought evidence about the health benefits of moderate-intensity activities (U.S. DHHS, 1999). More attention and research is currently focused on getting individuals involved in physical activity each and everyday. The Dietary Guidelines for Americans
2005 recommends that each individual should “engage in regular physical activity and reduce sedentary activities to promote health, psychological well-being, and a healthy body weight (U.S. DHHS & USDA, 2005).” Also recommended is at least 30 minutes of moderate-intensity physical activity most days of the week to reduce the risk of chronic disease in adulthood; approximately 60 minutes of moderate- to vigorous-intensity activity on most days of the week to help manage body weight and prevent gradual, unhealthy body weight gain; and at least 60 to 90 minutes of daily moderate-intensity physical activity to sustain weight loss in adulthood (U.S. DHHS & USDA, 2005).

Though many feel vigorous activity is required in order to see health benefits, moderate amounts of physical activity daily is all it takes. Examples of moderate intensity physical activity include a 30 minute brisk walk, 30 minutes of raking leaves or lawn mowing, 15 minutes running, or 45 minutes of playing volleyball. Emphasizing activities such as these will add variety daily and hopefully encourage more individuals to become more involved in physical activity each day (U.S. DHHS, 1999).

Health experts are now recommending an average of 10,000 steps each day to attain health benefits, including cardiovascular health (Tuft’s University Health and Nutrition Letter, 2002; Friends of the Center for Human Nutrition, 2003). This recommendation can be dated back to the 1960s in Japan. The Japanese encouraged walking clubs and promoted pedometer manufacturing, which is still prevalent in Japanese households today (Tuft’s University Health and Nutrition Letter, 2002; Tudor-Locke & Bassett, 2004). Acquiring 10,000 steps daily has been estimated to expend 300-400 calories per day. In comparison, 30 minutes of moderate physical activity is
approximately equivalent to an energy expenditure of 150 calories. Ten thousand steps
daily allows for activity levels to be “over and above” one activity, counting for all
activity achieved throughout an entire day (Tudor-Locke & Bassett, 2004).

The challenge for some individuals may be to achieve 10,000 steps daily, but
following the recommendation of 30 minutes of moderate intensity physical activity will
most likely help increase steps daily to reach the goal (Le Masurier, Sidman, and Corbin,
2003). Welk et al. (2000) showed that 73% of participants obtaining at least 30 minutes
of moderate activity also achieved at least 10,000 steps in the same day. Wilde et al.
(2001) reported that though women participants were prescribed 30 minutes of activity
daily, only 38-50% actually reached the goal of 10,000 steps any day. But, these women
did increase their daily steps from 7,220 to 10,030 steps a day when including a 30
minute walk.

Not only have studies proven that achieving 30 minutes of moderate activity helps
individuals reach the goal of 10,000 steps daily, but there are also health benefits for
accumulating at least 10,000 steps. The daily step goal can be done by most people of all
ages and various body sizes. Individuals achieving at least 10,000 steps daily have less
fat and lower blood pressure than less active individuals. Yamanouchi et al. (1995) were
the first to actually have an identifiable daily goal of 10,000 steps. Participants were part
of an exercise and diet group with type 2 diabetes that lived at the hospital during the 6-8
week study. Results showed that participants who averaged more than 19,000 steps per
day lost on average an estimated 7.7 kilograms. Though these individuals were confined
in a hospital setting, sheltered from everyday obligations and normal schedules with a
supportive staff, the participants did achieve more than the goal and had successive weight loss (Yamanouchi, Takashi, Chikada, et al., 1995). Iwane et al. (2000) looked at hypertensive individuals that averaged more than 13,000 steps daily, which resulted in a reduction in blood pressure. The 10,000 step recommendation provides a more tangible goal for increasing exercise while focusing more on behavior changes versus intensity (Tudor-Locke & Bassett, 2004).

Ten thousand steps a day may seem frightening to some people, but as with many goals, making small lifestyle changes each week can lead to the ultimate goal of improving health. It has been recommended for individuals to count the number of steps taken daily for 7 days and take an average to create a baseline. Once a baseline is established, progressive goals must be set to increase daily steps until the goal of 10,000 steps or more has been obtained (Tuft’s University Health and Nutrition Letter, 2002; Friends of the Center for Human Nutrition, 2003). Current physical activity levels have been recognized as 2,500 steps or less per day very inactive, 2,501-5,000 steps per day inactive, 5,001-7,500 steps per day moderately active, 7,501-10,000 steps per day active, and greater than 10,000 steps per day very active (Friends of the Center for Human Nutrition, 2003). The “10,000 steps” daily concept is a great motivator and can attract many individuals to become more active (Schnirring, 2001).

Keeping track of daily steps may be too difficult for many individuals to do on their own. Many physicians suggest investing in a step counter or pedometer to help track total daily steps. Pedometers have gained increasing popularity over recent years because these devices allow individuals to measure physical activity while providing
motivation to increase physical activity (Schnirring, 2001; Consumer Reports, 2004). Though the Japanese have been using and manufacturing pedometers since the 1960s, Americans are now discovering that the device is not only a good motivator, but can aid with research in intervention studies by measuring and accessing walking behaviors (Croteau, 2004; Tudor-Locke & Bassett, 2004).

Pedometers are simple, inexpensive tools used to track the number of steps taken when worn (Consumer Reports, 2004; Croteau, 2004). Pedometers objectively measure ubiquitous, ambulatory activity (i.e. walking, running) producing step counts (Croteau, 2004). The device should be worn on a belt or waistband, above the midline of the thigh, and must be snug to prevent recording movements other than steps (Consumer Reports, 2004). When worn correctly at the waistline, steps are counted when the vertical acceleration exceeds a specific threshold and the internal trigger mechanism records each movement as a step (Welk, Differding, Thompson, et al., 2000). Many models are simple and fairly inexpensive, but depending on what functions an individual wants the device to perform, the cost of a pedometer can range from $10 to $200 (Schneider, Crouter, Lukajic, and Bassett, 2003).

When pedometers are used for intervention purposes, many times a cheaper model will be used, but researchers must consider accuracy and validity. Many individuals state that pedometers are less accurate when measuring distance and expended energy, and are more reliable at counting steps (Tuft’s University Health and Nutrition Letter, 2002). Many studies have confirmed that not all pedometers are accurate; therefore, making researchers aware to account for accuracy and reliability
(Schneider, Crouter, Lukajic, and Bassett, 2003; Iwane, Arita, Tomimoto, et al., 2000; Wilde, Sidman, and Corbin, 2001; & Yamanouchi, Takashi, Chikada, et al., 1995). To test a particular pedometer for accuracy, first measure this by taking 100 steps. If the reading falls between 90 and 110, the pedometer is considered accurate (WIC Walk the Talk, 2006). Once an accurate and durable model has been chosen, an individual can start counting steps and reach a goal of 10,000 steps daily.

Walking programs that promote 10,000 steps with the use of a pedometer have been reported to have an impact of increasing physical activity. Once an individual has made the decision to increase physical activity daily, the more likely the individual will see success. A 10,000 Step program was initiated by HealthPartners, a large managed-care organization (MCO), to examine the impact on physical activity, motivational forces, and barriers to being active. Since walking had been identified as “inexpensive, relatively easy, and convenient,” this form of physical activity seemed appealing to the focus groups. Participants of the 10,000 Step program were recruited from a health-risk database, which consisted of MCO members with previous involvement with development of an employee health-improvement program. The program was an 8 month, mail-based program where each participant received the following: pedometer, personal action planner, log book to track steps, bi-weekly motivational cards for 8 weeks and bi-monthly for an additional 6 months, and an opportunity to enter drawings to win prizes. At the end of the first 8 weeks, participants were surveyed and researchers found that many participants had an increase in physical activity level. “Feeling better” and “having more energy” were the common benefits reported with enhanced confidence
levels in order to increase and maintain current step level. Improvements in participant’s readiness to be physically active were also recorded. Upon completion of the 10,000 Step program, results showed that participants that engaged in an average of 8,092 steps daily, met the recommendation of 30 minutes of physical activity 3.6 days per week. As a positive result, many participants continued to use pedometers as a motivational tool (Lindberg, 2000).

Intervention programs have illustrated that women using a pedometer walked more than those that merely attempted to walk 30-minutes each day. One particular study took inactive females and divided everyone into two groups: one group was told to engage in 30 minutes of brisk walking on most days of the week, and the other group was instructed to walk 10,000 steps per day using a pedometer. The group told to walk 10,000 steps daily acquired an average of 10,149 steps, while the other group took an average of 8,270 steps daily (Hellmich, 2005). “The pedometer is a constant reminder to walk more. More steps, more calories burned, more health benefits,” stated a director of the Center for Physical Activity and Health (Hellmich, 2005). Another pedometer-based intervention showed that participants increased daily steps from the baseline of 8,565 (± 3,121) to 10,538 (± 3,681) steps after the program, with obese individuals and those that averaged fewer than 6,000 steps experienced the greatest increase (Croteau, 2004).

When looking at physical activity, muscle strength, and functional performance in older adults with osteoarthritis of the knee, researchers found that by setting goals of various walking activity (Walk + program) of a total of 12 hours in 12 weeks, participants
increased walking with improved muscle strength and walking performance (Talbot, Gaines, Huynh, and Metter, 2003).

The studies prove that getting involved in physical activity daily by using the 10,000 steps a day program along with a pedometer has great emotional and physical benefits. The question that remains to be unanswered relates to why individuals continue to be inactive. Many obstacles keep people from becoming involved, but once the barriers have been identified, the individual must work to overcome the challenges and start getting involved in daily physical activity (CDC, 2005).

Modernization has brought about a huge change in the way people live, work, and play. Advancements in technology have altered occupations and transportation in a way that individuals spend little or no energy in daily activities (Montoye, H.J., 2000). Playing video games and television viewing are amongst the most popular after school activities. While looking at Body Mass Index (BMI), physical activity, and television viewing from childhood to adulthood in one particular study, early adolescence and adults involved in more physical activity and less television viewing had a lower BMI (Parsons, T.J. and Power, C., 2005). Personal factors including physiological, behavioral, and psychological variables have an impact on becoming more physically active (CDC, 2005). The ten most common reasons for physical inactivity among adults are (1) not having enough time, (2) find it inconvenient to exercise, (3) lack of self motivation, (4) do not find physical activity enjoyable, (5) find exercise boring, (6) lack of confidence, low self-efficiency, (7) fear of being injured or have been injured recently, (8) lack of self management skills including the capability to set personal goals, monitor and recognize
progress, and reward progress toward specific goals, (9) lack of encouragement, support, or companionship from family and friends, and (10) do not have the accommodations such as parks, sidewalks, or safe and pleasant walking paths suitably close to work or home (1...source within a source). When comparing gender differences and perceptions on accessibility of physical activity as one study did, women find neighborhoods unsafe for walks at night, see less people being active in local neighborhoods, have less access to places for physical activity, and places for shopping are not within easy walking distances from home (Garcia Bengoechea, E., 2005).

Understanding environmental opportunities and common barriers to physical activity while creating strategies for overcoming such obstacles may help individuals make physical activity part of everyday life. Support from family, friends, and the local community can be important influences for individuals getting involved and increasing physical activity. Family members and friends can provide support and encouragement an individual needs to become more physically active. When attempting to overcome lack of time and motivation, individuals need to set aside a particular time slot everyday and try joining an exercise group or asking a friend to join you as a source of motivation. People often complain of not having resources in order to engage in physical activity. Walking, jogging, dancing and jump roping are activities that can be done without a gym membership or expensive equipment. Use of community parks, education programs, and recreation programs are usually free to the public and can provide benefits as well (CDC, 2005).
Today’s lifestyle and fast pace often distracts individuals from becoming involved in physical activity, but evidence shows that individuals not involved in daily physical activity are putting themselves at risk for certain diseases. Only 30 minutes daily of moderate intensity exercise has been recommended to improve the health of Americans and lower the risks of developing chronic diseases such as obesity. No matter what age or how unfit a person may feel, starting physical activity today can improve an individual’s quality of life (CDC, 2005).

**Health Promotion and Theory**

Many Americans continue to participate in unhealthy eating behaviors and are not engaging in the recommended amount of daily physical activity. The effort of understanding how to promote more active, healthy lifestyles is of tremendous importance to individuals and for the health of the nation. Once determinants of physical inactivity and unhealthy eating habits have been identified, effective programs need to be conducted in order to decrease the rate of overweight and obesity, and see a healthier nation (U.S. DHHS, 1999).

As we move down the social ladder of society, life expectancy becomes shorter and most diseases are more common. Having fewer family assets, poorer educational background, insecure employment, poor living conditions, raising a family under difficult circumstances, and many other long term stressors can affect an individual’s health tremendously. Critical transitions occur throughout life and if certain resources, support, and education are not available to successfully move through each transition, health is once again jeopardized. “Stressful circumstances, making people feel worried, anxious,
and unable to cope, are damaging to health and may lead to premature health” (World Health Organization [WHO], 2003). Society can help by addressing certain policies to promote health standards and enable all citizens to become involved in social, economic, and cultural life. Schools, workplaces, and other institutions can provide the support system and material environment necessary for improving health. An increasing sense of belonging, participation, and being appreciated provides a healthier environment and positive attitudes (World Health Organization [WHO], 2003).

Adult health can be predicted by early childhood and even before birth. Slow growth rates and reduced social support raise poor physical health and decreases physical, cognitive, and emotional performance in adulthood. Poor conditions during pregnancy can lead to nutritional deficiencies, maternal stress, substance abuse, insufficient prenatal care, inadequate exercise, and poor fetal development resulting with health risks later in life. Policy can improve health in early stages of life by providing equal education opportunity, increasing the basic level of education, improving overall health of mothers to pass onto their babies eternally, and providing health education courses including the importance of good nutrition and increasing physical activity.

An adequate food supply along with a good diet is desired for promoting health and well-being. Malnutrition and deficiency diseases are often caused by a food shortage or lack of variety in a diet. Excessive consumption of food has been related to cardiovascular disease, diabetes, certain cancers, obesity, dental cavities, and degenerative eye disease. The important public health issue focuses on making healthy nutritious foods more affordable and available to all. Having access to nutritious,
affordable foods can make more of a difference in what people consume than health education (World Health Organization [WHO], 2003).

“Economic growth and improvements in housing and sanitation brought with them the epidemiological transition from infectious to chronic disease” (World Health Organization [WHO], 2003). Diets changed to over consumption of energy dense foods that are high in fat and sugar, thus producing overweight and obesity among Americans. Obesity among the poor has become more common because of the inability to eat well, and instead eating a diet consumed primarily of cheaper processed foods that are more economical than fresh foods. To prevent chronic diseases, dietary goals have been set to encourage the consumption of fresh fruits, vegetables, and whole grains while eating less processed foods containing animal fats, refined sugars, and salt. Society, along with national and international government, needs to support food production and agricultural methods that preserve natural resources to ensure a stronger food culture (World Health Organization [WHO], 2003).

With technological innovations and advancements, jobs and even household chores require less exercise, thus adding to the world epidemic of overweight and obesity. Machines now control physical labor in the workplace that was once done by humans. Road traffic and reliance on automobiles continue to increase, as well as pollution, road deaths and serious accidents, resulting in a decrease in activity. The use of public transportation, or using walking or cycling as a means of transportation can promote health by providing exercise, reducing fatal accidents, increasing social contact and reducing air pollution (World Health Organization [WHO], 2003).
Lack of opportunity and social determinants often prevent individuals from engaging in physical activity, though behavior and theory often play a greater role in increasing physical activity. Certain theories have been developed in order to further understand exercise behavior, which provides the framework for public health intervention. Interventions that describe behavioral theories and recognize behavioral changes are more likely to achieve a successful outcome (Conn, Tripp-Reimer, and Maas, 2003).

Behavior change creates a challenge of learning how to examine if the theory corresponds to a certain issue. Knowing how effective a theory has been in the past can assist planners in improving health behaviors. By using theory, practitioners better understand the planning process and become realistic of program outcomes (U.S. DHHS, National Institutes of Health, 2005).

Health behaviors affect and are affected by multiple levels of influence as well as the social environment. Factors contributing to health problems include: (1) intrapersonal or individual factors, (2) interpersonal factors, (3) institutional or organizational factors, (4) community factors, and (5) public policy factors. Different levels of influence can combine to affect the health of a particular population. The social environment includes individuals that influence and are influenced by surrounding people. Being able to identify influences on behavior can help health intervention, but knowing what intrapersonal factors prevent change also contributes to success (U.S. DHHS, National Institutes of Health, 2005).
Explanatory Theory illustrates why a certain problem exists and recognizes factors that contribute to the problem. Examples of Explanatory Theory would include the Health Belief Model and the Social Cognitive Theory. Change Theory helps guide the growth of health promotion. Planners use Change Theory to provide reason and proof why implementation was successful. An example of Change Theory has been identified as the Stages of Change Model (U.S. DHHS, National Institutes of Health, 2005).

The Social Cognitive Theory (SCT) focuses on the intrapersonal level of health behavior in which an individual becomes influenced by the social environment (U.S. DHHS, National Institutes of Health, 2005). Research has tested the SCT in predicting involvement of physical activity by observing self-efficacy, goals, and outcome expectation (Petosa, Suminski, and Hortz, 2003). Many factors such as personal, environmental, and human behavior contribute to the ongoing process of SCT, but with opportunity and support, behavior change can occur even when faced with obstacles (U.S. DHHS, National Institutes of Health, 2005). Petosa, Suminski, and Hortz (2003) had college students complete a set of instruments measuring SCT behavioral strategies (i.e. goal setting, self-monitoring, self-reinforcement, etc.) to control exercise. The results confirmed the use of SCT behavioral strategies to identify factors associated with physical activity level among college students (Petosa, Suminski, and Hortz, 2003).

The Health Belief Model (HBM) was developed in the 1950s to help identify health behavior and explain the lack of participants in programs which had been associated with reducing health risks. Health beliefs and individual’s readiness to take
action are variables affecting health behaviors. Perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and other variables are applications of the HBM that must be understood before achieving the desired outcome of a particular intervention (Abood, Black, and Feral, 2003).

Along with the HBM, certain planned behavior beliefs are used to determine if individuals will become involved and if the intervention will be a success. Behavioral beliefs are perceived as the positive and negative consequences of performing the behavior (Conn, Tripp-Reimer, and Maas, 2003). Rowland & Dickinson, et al. (1994) looked at retired women that participated in a heart health promotion program and concluded that encouraging words and positive attitudes toward exercise predicted behavior. Michels and Kugler’s (1998) study reported that with theory of planned behavior, attitudes, social norm, and perceived behavioral control of older adults can be strongly related with the intent to exercise. Perceived behavioral control and intention has shown to be significant determinants of exercise (Kerner and Grossman, 2001; Courneya and Friedenreich, 1997).

Normative beliefs are the approved or disapproved behaviors perceived by individuals of importance in relation to the individual contemplating change (Conn, Tripp-Reimer, and Maas, 2003). Wankel and Mummery (1993) found that normative beliefs predicted the intention to exercise in older Canadian women (Wankel & Mummery, 1993). Normative beliefs in another study predicted the stage of exercise adoption of older adults (Blue, 1995). Blue, Wilbur, and Marston-Scott (2001) showed
that cognitive factors can predict exercise behavior, but proved subjective norms were not a significant predictor.

Perceived control beliefs also affect an individual’s decision to become involved in change. The perception would include how difficult or easy it would be to perform the behavior. Perceived control beliefs have been important predictors of adult exercise behavior and intention (Blue, 1995; Blue, Wilbur, & Marston-Scott, 2001). Courneya and Friedenreich (1997) found perceived control beliefs of cancer patients provided the framework for initiation, intervention, and maintenance of exercise.

The Stages of Change Model states “behavior change is a process, not an event” (U.S. DHHS, National Institutes of Health, 2005). An individual moves through 5 stages when attempting to change behavior: pre-contemplation, contemplation, preparation, action, and maintenance. The pre-contemplation stage describes a period in which the individual has no intention of making change within the next 6 months because the behavior is viewed as not a priority (Samuelson, n.d.; U.S. DHHS, National Institutes of Health, 2005). The individual must increase the awareness for change through personalizing information concerning benefits and risks (U.S. DHHS, National Institutes of Health, 2005). During the contemplation stage, the individual intends on making change within the next 6 months, but requires motivation, encouragement, and possible emotional arousal to conquer this stage. Intentions to take action within the next 30 days and anticipating an actual schedule or event, marks the preparation stage (Samuelson, n.d; U.S. DHHS, National Institutes of Health, 2005). An individual needs assistance with developing and implementing concrete actions and setting gradual goals (U.S.
DHHS, National Institutes of Health, 2005). People must be careful during this stage because success or failure can become a reality. The action stage occurs when the individual becomes involved with behavior change and continues for 6 months. When implementing a health promotion program, the participant has changed behaviors in order to live a healthier lifestyle. Feedback, problem solving, social support, and reinforcement are possible strategies an individual needs during the action stage. When change of a particular behavior has occurred for more than 6 months and reactions have become habitual, an individual has evolved from the action stage to the maintenance stage (U.S. DHHS, National Institutes of Health, 2005; Samuelson, n.d). Understanding the stage of behavior change in the field of health promotion can assist with successful implementation (Samuelson, n.d).

Not only does an individual’s behavior and certain theories have an effect on the implementation of increasing daily physical activity, but the social environment and surrounding communities can have an impact on involvement in physical activity within a population (CDC, 2005). Communities come in all shapes and sizes and understanding the distinctive characteristics of a particular community is crucial when planning intervention. Using past methods and innovative tools of the past can “capture the successes of community-level health promotion efforts” (U.S. DHHS, National Institutes of Health, 2005).

Organizing community effort through recognizing a common problem, assembling resources, and developing strategies to reach the overall goal can be crucial when implementing a health program. It can be incorporated with SCT, recognizing
personal and environmental factors as well as human behavior (U.S. DHHS, National Institutes of Health, 2005). In order to promote healthy eating habits and increase daily physical activity among Americans, communities should identify barriers and motivations that would help inform and support an effective health promotion program.

Successful health promotion and public health programs help individuals reduce risks of developing diseases, manage chronic illness, and maintain or improve overall health. Health programs not only affect individuals, but can also influence the health of families, friends, organizations, and communities (U.S. DHHS, National Institutes of Health, 2005). Community-based intervention programs offered at schools and workplaces have shown success in increasing physical activity (Friends of the Center for Human Nutrition, 2003). Worksite wellness programs have become increasingly popular due to greater health-related costs and the relation between wellness/health statuses of employees. The associations between health status and mortality among lifestyle behaviors have encouraged organizations to initiate wellness programs in order to control health related costs (Haynes, Dunnagan, and Smith, 1999).

Stein, Khoury, and Zuidema (2000) examined involvement of employer-sponsored health promotion and the effects on work performance. Research found that participation was proportional to overall health risk, levels of body fat, cholesterol, and blood pressure, and to levels of prior-year activity/fitness scores. There was also an association with a reduction in absenteeism as well as medical claims paid and short term disability (Stein, Khoury Shakour, and Zuidema, 2000).
Ozminkowski & Ling, et al. reviewed the long-term impact of Johnson and Johnson’s Health and Wellness Program on health care expenditures and utilization. Employees were followed for 5 years prior to and 4 years after implementation of the program. Results revealed a reduction in medical care expenditures with reduced inpatient use, fewer mental health visits, and reduced outpatient visits over the 4-year program period (Ozminkowski, et al. 2002).

As employers encourage employees to become more involved in physical activity, individuals usually look towards an activity that can be easy and inexpensive. Walking can be both easy and inexpensive as well as a lower impact aerobic exercise that an individual of all ages can get involved. Walking can be done anywhere and anytime as long as the individual has a comfortable pair of shoes (Women’s Heart Foundation, 2000; NIDDK, 2004).

Thousands of individuals have discovered the benefits of daily walking. Walking briskly for at least 30 minutes daily can reduce the risk of heart diseases and cancer, reduce total cholesterol, raise HDL cholesterol, and lower blood pressure. It can also help with muscle tone, maintaining healthy bones, regulating blood sugars, improving immunity and reducing some stresses in life (Women’s Heart Foundation, 2000; NIDDK, 2004). Because of the health benefits provided by walking daily, many individuals and organizations have started walking programs (NIDDK, 2004).

Programs often offer the support and motivation one needs in order to begin physical activity. Many offer goal setting techniques, supplemental health education information, and community involvement to encourage individuals. Pedometers are often
offered as an incentive and allow individuals an accurate way to track total number of steps taken (BlueCross BlueShield of Nebraska, 2003).

A California Special Supplementation Nutrition Program for Women, Infant, and Children (WIC) participated in a staff wellness pilot to improve staff self-efficiency in counseling WIC clients about childhood obesity. Eighty-five percent (85%) of dietetic professionals that exercised regularly rated exercise as a very important area of counseling versus 48% that were non-exercisers. Staff were more likely to report the workplace physical activity environment supported efforts to make healthy food choices, be physically active, make positive changes in counseling parents about the child’s weight, and feel more comfortable in encouraging WIC clients to increase physical activity with children (Crawford, 2004).

Organizations such as Blue Cross Blue Shield, Women’s Heart Foundation, and the National Institute of Diabetes and Digestion and Kidney Diseases (NIDDK) offer tips on how to start a walking program. Offering safety tips, stretching techniques, goal setting strategies, selection of proper footwear and clothing, using a pedometer, log sheets, and incentives can increase participation and daily activity levels (Women’s Heart Foundation, 2000; NIDDK, 2004; BlueCross BlueShield of Nebraska, 2003). Taking Sound Steps was developed to promote walking among older adults. The program offers participants organized walking groups and log sheets to serve as a daily reminder of how much activity had been achieved. Participants found the log sheets useful and described how much easier it was walking with other individuals in contrast to walking by themselves (Cheadle, Gregg, Lewis, Schwartz, and Walwick, 2004).
Taylor and colleagues (2003) observed the effectiveness of a walking program of residents living in an assisted living facility. Seventeen (17) women, ages 62-99, volunteered to participate in a “walking club” for 9 weeks. At the end of the intervention, all pre-test measurements had improved significantly. Participants reported the walking program was a pleasure activity, provided a way to manage current health problems, offered life-long activity, and enabled physical and psychological benefits from the activity (Taylor and Whittington et al., 2003).

Establishing community based intervention programs while identifying health behaviors and theories can lead to positive reinforcement. Recognizing barriers, both social and environmental, can help guide practitioners to more effective health promotion programs (U.S. DHHS, National Institutes of Health, 2005). Supplying individuals with motivation and support to increase physical activity can better the health of the entire nation.

**Coordinated School Health Program**

Good nutrition becomes an essential element of good health. Good health and nutrition plays a vital role in the growth and development of children and adolescents. Poor diet, accompanied with physical inactivity, can result in overweight and obesity because more calories are consumed than expended (U.S. DHHS & USDA, 2005).

Dramatic increases of overweight and obesity have occurred in children and adolescents of both sexes (U.S. DHHS & USDA, 2005). Seventeen (17) percent of children and adolescents from 2 to 19 years of age are considered to be overweight (Ogden, Carroll, Curtin, McDowell, Tabak, and Flegal, 2006). Overweight children and
adolescents are more likely to remain overweight or become obese adults, therefore being at risk for related adult health problems (Ferrara, Thorpe, and Wilkinson, 2003; CDC, 2005, April). One study’s results showed children that were overweight by the age of 8 years were more likely to be seriously obese adults (Freedman and Khan et al., 2001). Healthy habits such as eating healthy foods and exercising daily can reduce the chances of becoming overweight and developing associated diseases (CDC, 2005, April).

To promote and improve the lifelong eating behaviors and physical activity habits of children, often nutrition based education programs at schools are implemented. These programs are committed to being on the forefront of making nutritional changes, providing nutrition education activities and events, and using current recommendations set by the *Dietary Guidelines* to promote health (USDA, n.d.). Preventing overweight and obesity can be addressed by implementing physical activity and nutrition through a coordinated school health program (CDC, 2005, April).

A coordinated school health program (CSHP) model comprises eight interactive components: (1) Health Education, (2) Physical Education, (3) Health Services, (4) Nutrition Services, (5) Counseling, Psychological, and Social Services, (6) Healthy School Environment, (7) Health Promotion for Staff, and (8) Family/Community. Schools should not be left alone to address one of the nation’s most prevalent health and social problems (CDC, 2005, April).

Health Education addresses physical, emotional, and social degrees of health. It provides students with health related knowledge, skills, attitudes, and practices to help maintain and improve personal health. Examples of topics covered include personal
health, family health, community health, environmental health, consumer health, mental and emotional health, nutrition, sexuality education, injury prevention and safety, prevention and control of disease and substance and alcohol abuse (CDC, 2005, April).

Physical Education provides experience in a variety of activities that promote optimal physical, mental, emotional, and social development (CDC, 2005, April). The Youth Risk Behavior Survey (YRBS) results showed that 82% of youth participated in insufficient, moderate physical activity. Sixty-nine (69) percent of youth were not enrolled in physical education classes and 77% did not attend physical education class daily (Centers for Disease Control and Prevention [CDC], 2003). Only 8% of elementary schools, 6.4% of middle/junior high schools, and 5.8% of senior high schools actually provide the daily physical activity of 150 minutes for elementary school and 225 minutes for middle/junior and senior high schools per week for students (Centers for Disease Control and Prevention [CDC], 2001). Physical Education should encourage activities and sports to all students in order to pursue and enjoy life (CDC, 2005, April).

Health Services are offered to students to evaluate, defend, and endorse health. These services include having access to primary health care, thwart and restrain communicable diseases, and promote optimal sanitary conditions for a safe school environment. Not only can the child benefit from health services, but so can family and communities by educational and counseling opportunities (CDC, 2005, April).

Nutrition Services allow students to have access to healthy and appealing meals. Meals should be accommodating to all children and meet health and nutritional needs.
School nutrition programs mirror the U.S. *Dietary Guidelines for Americans* while serving as a resource for nutrition and health education (CDC, 2005, April).

Counseling and Psychological Services is the fifth component involved with CSHP. This service promotes mental, emotional, and social health to the students and social environment. Another component which deals with physical, emotion, and social conditions affecting the health of both students and staff is Healthy School Environment. Healthy School Environment monitors the physical and aesthetic surroundings and the psychosocial climate and culture of the school (CDC, 2005, April).

Another component of the CSHP focuses on Health Promotion for Staff. Opportunities such as health assessments, health education, and health related fitness activities that are offered can help to improve the health status of school staffs. Not only can staff improve health status, but these activities can improve morale and create a greater sense of connection with the school’s overall CSHP. This commitment to health is often transferred to the students and establishes effective role modeling. Health promotion programs can also lead to improved productivity, reduced absenteeism, and lower health insurance costs (CDC, 2005, April).

The last component focuses on Family/Community Involvement. This implies that school, parent, and communities can play a role in enhancing the health of the student. Evaluation of parental influences on a child’s food selection and consumption has been of interest to research. One study suggested that disinhibited eating among parents, coupled with dietary restraint, resulted in children having increased body fat (Hood and Moore et al., 2000). Studies have also demonstrated the positive effects
parents have on encouraging healthy foods to children. Both with the threat of being monitored and actually being monitored by a parent resulted in a lower consumption of non-nutritious foods, thus decreasing total calories consumed at a meal (Klesges and Stein et al., 1991).

Beginning healthy habits early in life by eating nutritious foods and engaging in physical activity can prevent a further increase in overweight children nationwide. Working with schools can be a wonderful way to implement health of students by providing nutritious foods and a variety of exercise (Dalton, 2004). Communities, schools, and parents can come together and identify problems within the school and work towards analyzing and developing necessary steps for change (Education Development Center, 2001).

The purpose for examining past literature on healthy eating, increasing physical activity, health promotion and theory, and coordinated school health programs is part of implementation of a CSHP at an elementary school, Health Promotion for Faculty and Staff. The present study observes behavioral and healthy lifestyle changes after implementation of a walking program among teachers at an elementary school. Teachers and staff were evaluated and encouraged to seek healthier physical activity behaviors by offering group physical activity, pedometers, health screenings once a semester, and bi-monthly nutrition and health information.
Methods

Data Collection Procedures

A Coordinated School Health Program (CSHP) was implemented at an elementary school (grades K-2) in Starkville, Mississippi. During fall semester, all teachers and staff (n=102) were invited to a Teacher Health Fair. Initial health screenings were performed at this time. Once consent forms were signed and obtained, anthropometric measurements, including height, weight, body mass index (BMI), and waist and hip circumferences were collected. Height was measured to the nearest 0.1 cm on a portable stadiometer. A Tanita TBF-300A Body Composition Analyzer (Tanita/Itin Scale Company, Brooklyn, NY) was used to assess percent body fat via bioelectrical impedance analysis measurements, including BMI and weight for participants. Waist-to-Hip Ratio (WHR) was calculated as waist circumference (cm) divided by hip circumference (cm). Methods for collecting height, weight, BMI, waist and hip circumference measurements followed the School Physical Activity and Nutrition (SPAN) Project Protocol (Hoelscher, Day, Lee, et al., 2004).

Once completion of the 13-week walking program, all teachers and staff were encouraged to attend a second health screening during the end of the spring semester. Anthropometric measurements including, height, weight, BMI, and waist and hip circumferences were obtained again as a follow-up from the previous semester’s teacher health fair. At this time, a post-post survey (Appendix A) was distributed to participants and non-participants in order to assess the effectiveness of the walking program for teachers and staff at an elementary school. A post-post survey is provided at the end of
implementation, but evaluates attitudes and measurements before and after implementation. Data was kept confidential and codes were distributed to identify subjects rather than names. Institutional Review Board (IRB) approval was attained from the Mississippi State University IRB as part of a larger study.

Subjects

All faculty and staff (n=102) were invited to participate in the Bee Active Walking Program at an elementary school. Demographics were obtained for 99 teachers and staff during the initial health screening at a teacher health fair prior to participation in the walking program, (Table 1). All participants read and signed an informed consent approved by the Mississippi State University IRB before beginning involvement in the walking program. Of the 102 teachers and staff, 97.1% (n=99) completed the post-post survey upon completion of the 13-week walking program.

Table 1

Demographics of Teachers and Staff (n=99)

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Ethnicity %</th>
<th>Gender %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Youngest</td>
<td>Non-black</td>
<td>Male</td>
</tr>
<tr>
<td>24</td>
<td>54.5 (n=54)</td>
<td>4.0 (n=4)</td>
</tr>
<tr>
<td>Oldest</td>
<td>Black</td>
<td>Female</td>
</tr>
<tr>
<td>62</td>
<td>45.5 (n=45)</td>
<td>96.0 (n=95)</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Measurements/Protocol

As part of the Coordinated School Health Program, a 13-week walking program was offered to teachers and staff. The program included distribution of pedometers, daily log sheets (Appendix B), bi-monthly nutrition and health information (Appendix C) to all
faculty and staff, and walking groups 6 times a week for participants. Accusplit, AX120 activity pedometers (San Jose, CA) were provided and have been established as reliable and valid tools for measuring daily steps (Accusplit, n.d.; WIC Walk the Talk, 2006). Brochures were distributed with all pedometers at a Teacher Health Fair to familiarize participants on how to correctly use and interpret the pedometer.

In order to assess the effect of the Bee Active Walking Program, a post-post survey (Appendix A) was distributed at the end of the 13-week. Participants and non-participants (n=99) completed the survey that included questions pertaining to physical activity, eating behaviors, and effectiveness of the program. The survey was a self reported instrument developed by researchers in order to determine behavioral and healthy lifestyle changes as a result of an intervention.

**Intervention**

All teachers and staff (n=102) were invited to a Teacher Health Fair where introduction of the Bee Active Walking Program was discussed. Pedometers and information were distributed at that time addressing the importance of increasing daily physical activity, the 10,000 steps a day recommendation, and how to properly use a pedometer. The Teacher Health Fair was held 2 months prior to implementation of the walking program so individuals could establish a baseline and set goals for increasing steps. The 13-week intervention encouraged participants to set a goal of 10,000 steps daily, or 70,000 steps per week.

Once the 13-week walking program began, participants were provided weekly log sheets to help track the number of steps taken daily. The log sheets were provided as a
self monitoring tool to help participants set goals and track success throughout the program. Participants were encouraged to turn in weekly log sheets in order for researchers to track weekly progress as well. Bi-monthly health information, *Bee Active Newsletter*, (Appendix C) concerning healthy eating habits and ways to promote daily activity were provided to all teachers and staff. Each issue of the *Bee Active Newsletter* was placed in each teacher and staff member’s mailbox to provide supplemental nutrition and health related information as part of the health promotion program. To increase daily steps, walking groups operating 6 times a week were provided. Group walking times were offered 3 times a week at 6:00 am and 3 times a week at 3:15 pm right as school was dismissed. At least one group leader/researcher was present during each walking group, who were paid by the program for involvement and time spent. During group walking times, participants walked approximately 30 minutes in the surrounding area/neighborhood of the elementary school. Upon completion of the *Bee Active* Walking Program, post-post surveys were distributed, at a luncheon provided to all teachers and staff as an incentive.

**Data Analysis**

Data were analyzed using SAS (version 9.1.2, 2005, SAS Institute Inc., NC, USA). Subjects were separated into participant group and non participant group for analysis. Statistical significance was set at \( p \leq .05 \).
Results

The study investigated behavioral and healthy lifestyle changes after implementation of a walking program among teachers at an elementary school. Out of the total 102 teachers and staff members, 97.1% (n=99) completed the post-post survey (Appendix A) upon completion of the 13-week walking program. Survey results showed that of the 99 teachers and staff, 31.3% (n=31) participated, 63.6% (n=63) were non-participants, and 5.1% (n=5) were non-responsive.

Of the 31.3% (n=31) that participated, 93.6% (n=29) have made efforts in the past to increase daily activity, and 58.1% (n=18) found the Bee Active Walking Program to be more effective than previous attempts to increase daily activity. A reported 74.2% (n=23) of participants found that wearing the pedometer helped motivate more physical activity and increase total daily steps taken. The top two reasons for becoming involved in the walking program among participants were to improve overall personal health and improve body image.

Since beginning the Bee Active Walking Program, 77.4% (n=24) of participants reported to have attempted to increase daily step counts and 58.1% (n=18) found walking with other individuals encouraged more physical activity. Simple statistics were used to compare the number of steps taken before and during the Bee Active Walking Program among participants (Table 2). Participants reported that only 41.9% set weekly goals to improve total weekly step counts. Becoming involved in a regular workout program among participants was reported not significant (p>1.000) when comparing both before and after implementation of the walking program.
Table 2

Number of Steps Taken Before and After the Walking Program

<table>
<thead>
<tr>
<th>Average Daily Steps</th>
<th>Activity Level</th>
<th>% Before</th>
<th>% After</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,500 or less</td>
<td>Very Inactive</td>
<td>6.5</td>
<td>12.9</td>
</tr>
<tr>
<td>2,501-5,000</td>
<td>Inactive</td>
<td>3.2</td>
<td>6.5</td>
</tr>
<tr>
<td>5,001-7,500</td>
<td>Moderately Active</td>
<td>16.1</td>
<td>19.4</td>
</tr>
<tr>
<td>7,501-10,000</td>
<td>Active</td>
<td>19.4</td>
<td>32.3</td>
</tr>
<tr>
<td>10,000 or greater</td>
<td>Very Active</td>
<td>16.1</td>
<td>22.6</td>
</tr>
<tr>
<td>Did not wear the pedometer</td>
<td></td>
<td>12.9</td>
<td>-</td>
</tr>
<tr>
<td>Unsure of the amount</td>
<td></td>
<td>16.1</td>
<td>-</td>
</tr>
<tr>
<td>No Response</td>
<td></td>
<td>9.7</td>
<td>6.5</td>
</tr>
</tbody>
</table>

Among the 63.6% (n=63) who did not participate, scheduling conflicts and lack of time were the top two involvement barriers. Other barriers included weather, lack of onsite childcare, previous commitments, lack of incentives and walking location. Non-participants reported that 80.9% (n=51) have attempted to increase physical activity in the past.

As a result of providing bi-monthly nutritional information (*Bee Active Newsletter, Appendix C*) as part of the 13-week intervention, both participants and non-participants attempted to make healthier choices while increasing their consumption of fruit and vegetables significantly (p<0.00001), (Table 3). There was no statistically significant observed for increasing dairy consumption or decreasing number of times eating out during the intervention among either groups. Surprisingly, non-participants had a statistically significant difference in daily consumption of water (p-value< 0.0203).
Table 3
Consumption of Fruits and Vegetables

<table>
<thead>
<tr>
<th>Number of Servings Daily</th>
<th>% Before</th>
<th>% After</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>46.5</td>
<td>24.4</td>
</tr>
<tr>
<td>3-5</td>
<td>47.7</td>
<td>61.6</td>
</tr>
<tr>
<td>&gt;5</td>
<td>5.8</td>
<td>14.0</td>
</tr>
</tbody>
</table>

Participants and non-participants found articles from the *Bee Active Newsletter* containing recipes, nutrition and diet information, and physical activity to be of most importance. Table 4 reports how often both participants and non-participants read the bi-monthly *Bee Active Newsletter*. During this study, only 31.3% (n=31) reported participating in the *Bee Active Walking Program*, but among respondents (n=64) of the survey, 70.3% (n=45) stated to participate if the program was offered again.

Table 4
Frequency of Reading the Bi-monthly *Bee Active Newsletter* by Participants and Non-Participants

<table>
<thead>
<tr>
<th></th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every Issue (n=6)</td>
<td>50.5 (n=50)</td>
</tr>
<tr>
<td>Some Issues</td>
<td>29.3 (n=29)</td>
</tr>
<tr>
<td>None of the Issues</td>
<td>8.1 (n=8)</td>
</tr>
<tr>
<td>Only Issues of Interest</td>
<td>2.0 (n=2)</td>
</tr>
<tr>
<td>No Response</td>
<td>10.1 (n=10)</td>
</tr>
</tbody>
</table>

Discussion

With overweight and obesity on the rise among adults, children and adolescents, efforts towards health promotion programs, including healthy eating habits and increasing physical activity, must be considered to improve the health of the nation.
Walking programs that provide pedometer, goal-setting skills, daily walking groups, and supplemental nutrition information have been found effective. Although preliminary, results from this study indicate that the 13-week health and wellness intervention was effective in increasing physical activity and promoting some healthy eating habits.

All teachers and staff members (n=102) were encouraged to increase physical activity by wearing the pedometer provided. Once a baseline was established by taking a weeks average of total daily steps, teachers and staff were to increase daily steps taken until the goal of 10,000 steps was reached. While providing positive role modeling, teachers and staff becoming more involved in physical activity should anticipate more physical activity among students. Through implementation of this particular walking program, 77.4% (n=24) of participants reported an increase in the number of steps taken daily. Participants (n=31) not only reported to have increased the number of daily steps taken, but also 58.1% (n=18) found the Bee Active Walking Program more effective than previous attempts to increase daily physical activity.

Adopting healthier eating habits can also improve overall health of an individual and influence others to choose more wisely. Promoting healthier eating habits among teachers and staff will hopefully influence the students to begin healthier habits as well. Improvements of fruit and vegetable consumption may have been a result of providing bi-monthly nutrition information. Another factor to be considered as influential to the increase of fruit and vegetable consumption was the competitive pilot grant provided by the U.S. Department of Agriculture and administered by the Mississippi Department of Education. As part of the grant, each school provided every child with a fruit or
vegetables snack daily, thus increasing the awareness of consuming fruit and vegetables daily among students and staff.

With less than half of all teachers and staff members participated in the 13-week walking program, a reported 70.3% \((n=45)\) among respondents \((n=64)\) would participate if the *Bee Active* Walking Program was offered again. While some individuals discovered the benefits of increasing physical activity and healthier eating habits, many still faced obstacles. Barriers that were considered included weather, lack of onsite childcare, previous commitments, lack of incentives and walking location which lack of time and schedule conflicts being the top two among non-participants. Though many individuals at the beginning of the *Bee Active* Walking Program walked during group walking times offered by researchers, many dwindled off. Being able to identify barriers among non-participants should be reviewed and considered for future implementations.

Limitations were also present for researchers when comparing and reporting data conclusions.

As a result of only providing teachers and staff with a post-post survey, researchers were unable to truly compare the impact of the 13-week health promotion program. A pre-post survey would be ideal to compare the before and after behaviors of teachers and staff members. Though participants were encouraged to turn in weekly log sheets, only a small percentage of participants returned log sheets. By not having every participant report weekly steps taken, researchers were incapable of determining if participants actually increased weekly steps.
Another limitation of this particular study includes that though individuals began the walking program, many did not fully participate in the 13-weeks. Because researchers did not have all participants turn in step counts weekly, this allowed participants to begin and end the walking program freely. As researchers began to see the rate of individuals walking among the walking groups steadily decrease, questions began to arise on how to increase participation. Lack of incentives was reported as a barrier and could be offered weekly to increase participation if implementation is offered again.

In summary, health promotion programs can offer many health benefits just by increasing daily physical activity and choosing healthy, nutritious foods. No definite conclusion can be drawn from this particular study on either the effects of a walking program or the barriers individuals face. The data strongly suggest that by providing pedometers and bi-monthly nutritional information can increase daily steps and improve certain eating habits. More research and date are needed to understand how to increase the involvement of employees in health promotion programs. There is need for further investigation into the means of behavioral change and influences that prohibit individuals from involvement in a health promotion walking program.
Bibliography


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Tuft’s University Health and Nutrition Letter, (2002, June). 10,000 Steps a Day-Give or Take for Fitness: A pedometer can help you count; 8.


Yamanouchi, K., Takashi, T., Chikada, K. et al (1995). Daily walking combined with diet therapy is a useful means for obese NIDDM patients not only to reduce body weight but also to improve insulin sensitivity. *Diabetes Care, 18*(6): 775-778.
APPENDIX A

TEACHER/STAFF POST-POST SURVEY

BEE ACTIVE WALKING PROGRAM
Teacher/Staff Survey – *Bee Active* Walking Program

Please answer each of the following questions.

**Program Information**

I participated in the *Bee Active* Walking Program.  ____ Yes  ____ No

Did the weekly log sheet help you keep track of your steps?  ____ Yes  ____ No

During the 13 weeks of the *Bee Active* Walking Program, I turned in

______ All 13 log sheets  
______ 7-12 log sheets  
______ 1-6 log sheets  
______ No log sheets

What was your main reason for being involved in the *Bee Active* Walking Program? (check all that apply)

__ Medical reasons (physician recommendation)
__ Improve overall personal health
__ Improve body image
__ Fellowship
__ Stress Reduction
__ Recreation
__ Other (please specify)

If you did not participate in the walking program on a regular basis, which of the following barriers kept you from walking with the *Bee Active* groups? (Please check all that apply)

__ Weather (rain, too cold, too hot,…)
__ Schedule conflicts
__ Lack of onsite childcare
__ Lack of time
__ Previous commitments
__ I participate in other physical activities
__ Lack of incentives
__ Walking location
__ Other (specify) ________________________________

Have you ever tried to increase your daily amount of physical activity in the past?  ____ Yes  ____ No
Was the *Bee Active* walking program ___ in increasing your physical activity than your previous attempts?

___ More effective
___ Less effective
___ Equally effective

If offered again, would you participate?

___ Yes, I would participate, but walk on my own
___ Yes, I would participate and would like to walk with the group
___ I am interested, but unsure
___ No, I am not interested

**Physical Activity**

If you wore the pedometer during the 2 months prior to the *Bee Active* walking program (when given the pedometer at the Health Fair), how many steps do you estimate that you walked each day?

___ 2,500 steps or less
___ 2,501-5,000 steps
___ 5,001-7,500 steps
___ 7,501-10,000 steps
___ 10,000 steps or greater
___ Did not wear the pedometer
___ Unsure of the amount of steps

How many steps do you estimate that you walked each day DURING the *Bee Active* walking program?

___ 2,500 steps or less
___ 2,501-5,000 steps
___ 5,001-7,500 steps
___ 7,501-10,000 steps
___ 10,000 steps or greater
___ Did not participate in *Bee Active*

How did you acquire the majority of the steps you reported above?

___ With the *Bee Active* Walking Group
___ Walked on your own
___ Participated in exercise other than walking
___ All steps were from normal, daily activities
___ Other (specify) ____________________________________________

Do you think that you have taken more steps on a daily basis since starting the *Bee Active* walking program? ___ Yes ___ No

Did wearing your pedometer help motivate you to become more active? ___ Yes ___ No
Did you set weekly goals to improve your total weekly step count?  __Yes   __No

Did walking with someone else encourage you to become more physically active?  
__Yes   __No

Since starting the Bee Active walking program, do you try to find other ways to increase your daily step count?  __Yes   __No

If you answered yes to the above question, what other methods have you tried to increase your steps? (please check all that apply)
__ Park farther away when going shopping
__ Take the stairs
__ Go on family walks
__ Walk the dog
__ Walking to places that are less than a mile
__ Other (specify) ____________________

Before the Bee Active walking program did you have a regular workout program?
__ Yes   __ No

If YES, which of the following activities did you do?

<table>
<thead>
<tr>
<th>Activity</th>
<th>1-2</th>
<th>3-4</th>
<th>5+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerobics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bicycling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Running</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight training</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yoga/Pilates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (specify what activity and times per week)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Since the Bee Active walking program have you begun an exercise program?
__ Yes   __ No

If YES, which of the following activities did you do?

<table>
<thead>
<tr>
<th>Activity</th>
<th>1-2</th>
<th>3-4</th>
<th>5+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerobics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bicycling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Running</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Tennis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight training</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yoga/Pilates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (specify what activity and times per week)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Eating Patterns

Since the *Bee Active* walking program have you tried to make healthier food choices?

__Yes  ___No

**Before** the *Bee Active* walking program, how many *servings* of fruits and vegetables would you estimate that you consumed daily? (1 *serving* is equivalent to 1 medium size piece of fruit, ½ cup cooked or raw fruit/vegetables, ¾ cup of fruit/vegetable juice)

__ 0-2  ___ 3-5  ___ >5

**Since** the *Bee Active* walking program, how many *servings* of fruits and vegetables do you consume daily? (1 *serving* is equivalent to 1 medium size piece of fruit, ½ cup cooked or raw fruit/vegetables, ¾ cup of fruit/vegetable juice)

__ 0-2  ___ 3-5  ___ >5

**Before** the *Bee Active* walking program, how many *servings* of dairy would you estimate that you consumed daily? (1 *serving* is equivalent to 8 oz yogurt, 1 cup milk, 2 oz cheese)

__ <1  ___ 2-3  ___ >3

**Since** the *Bee Active* walking program, how many *servings* of dairy do you consume daily? (1 *serving* is equivalent to 8 oz yogurt, 1 cup milk, 2 oz cheese)

__ <1  ___ 2-3  ___ >3

**Before** the *Bee Active* walking program, how many glasses of water would you estimate that you consumed daily? (1 glass = 8 oz)

__ 1-3  ___ 4-5  ___ 6-8  ___ >8

**Before** the *Bee Active* walking program, how many glasses of water would you estimate that you consumed daily? (1 glass = 8 oz)

__ 1-3  ___ 4-5  ___ 6-8  ___ >8
How many times each week does your family eat meals prepared at home, sitting together?
  __ 0-2
  __ 3-5
  __ 6-8
  __ >8

**Before** the *Bee Active* walking program, I ate out __ per week. (Including fast food restaurants, drive-thru restaurants, traditional/family restaurants, buffets, school cafeterias, take out/delivery)
  __ 1-3 meals
  __ 4-6 meals
  __ 7-10 meals
  __ >10 meals

**Since** the *Bee Active* walking program, I ate out __ per week. (Including fast food restaurants, drive-thru restaurants, traditional/family restaurants, buffets, school cafeterias, take out/delivery)
  __ 1-3 meals
  __ 4-6 meals
  __ 7-10 meals
  __ >10 meals

When eating meals prepared away from home, I most often choose:
  __ Fast Food Restaurants
  __ Drive-thru Restaurants
  __ Traditional/Family Restaurants
  __ Buffet Style Restaurants
  __ School Cafeteria
  __ Take Out/Delivery

*Bee Active Newsletter*

How often have you read the *Bee Active* bimonthly newsletter?
  __ Every issue
  __ Some issues
  __ None of the issues
  __ Only the issues that interested me

What information would you like to see in the *Bee Active* Newsletter?
  __ Physical activity/Exercise articles
  __ Diet/Nutrition articles
  __ Relevant health websites
  __ Recipes
  __ Suggestions for activity
  __ Other (specify) ____________________________________________
Please make any comments concerning the walking program, both benefits and areas needing improvements.
APPENDIX B

TEACHER/STAFF LOG SHEETS

BEE ACTIVE WALKING PROGRAM
# Weekly Step Log

Name ____________

<table>
<thead>
<tr>
<th>Steps Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
</tr>
<tr>
<td>Tuesday</td>
</tr>
<tr>
<td>Wednesday</td>
</tr>
<tr>
<td>Thursday</td>
</tr>
<tr>
<td>Friday</td>
</tr>
<tr>
<td>Saturday</td>
</tr>
<tr>
<td>Sunday</td>
</tr>
<tr>
<td>Total Steps Taken</td>
</tr>
</tbody>
</table>

**Please record steps taken on a daily basis and turn in each Monday!**
APPENDIX C
BI-MONTHLY HEALTH RELATED INFORMATION

BEE ACTIVE NEWSLETTER

ISSUES 1-6
Bee Active Newsletter

Issue 1

March 1, 2005

Regular physical activity and physical fitness make important contributions to one's health, sense of well-being, and maintenance of a healthy body weight. ~Dietary Guidelines for Americans, 2005

We are excited to announce the first issue of the Bee Active Newsletter. This newsletter will be sent out twice a month throughout the semester. It will contain information on nutrition and physical activity. We would like to personalize this newsletter to your wants and needs. If there are any topics you would like to see discussed in this newsletter or if you have questions regarding the walking program, please send them to Steven at sun20@massmail.edu or Sara at saraf@massmail.edu.

This issue will provide you with a general overview of the Bee Active program along with a few helpful hints on walking and physical activity.

Important information from the 2005 Dietary Guidelines:

- In 2002, 25% of adult Americans did not participate in any leisure time physical activities in the past month.
- In 2003, 38% percent of students in grades 9 to 12 viewed television 3 or more hours per day.
- Regular physical activity is a key factor in achieving and maintaining a healthy body weight for adults and children.
- To help manage weight and prevent gradual, unhealthy body weight gain in adulthood: Engage in approximately 60 minutes of moderate-to-vigorous-intensity activity on most days of the week while not exceeding caloric intake requirements.

- People with higher levels of physical fitness are at lower risk of developing chronic diseases.
- Conversely, a sedentary lifestyle increases risk for over weight and obesity and many chronic diseases, including coronary artery disease, hypertension, type 2 diabetes, osteoarthritis, and certain types of cancer.
- For most people, greater health benefits can be obtained by engaging in physical activity of more vigorous intensity or longer duration.
- Achieve physical fitness by including cardiovascular conditioning, stretching exercises for flexibility, and resistance exercises or calisthenics for muscle strength and endurance.

Tips for Getting More Steps

- Park further away from stores.
- Take stairs instead of elevators or escalators.
- Plan activities with family and friends.
- Use restrooms further away from your office or classroom.
- Use breaks to get in extra steps. Not only does this increase your step count, it prevents your muscles from getting sore and tight throughout the day.
- Walk and talk with friends instead of sitting and talking.
- Walking with a friend or as part of a walking group helps keep you accountable.
- Check your step count throughout the day for motivation.

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Healthy Children, Families, and Communities

Bee Active Newsletter

Issue #2 March 22, 2005

In this edition:
Healthy Portions............1
Walking Tips..................1
Food Guide Pyramid.........2
What is Health?..............2
Website of Interest.........2

It's Not Too Late!!
You may have forgotten to turn in a log sheet one week. Or you've been sick and haven't been walking. It's never too late to join us. Maybe you just haven't been wearing your pedometer. That's ok. You can still be a part of the Bee Active program. Just make sure you return your consent form and start walking today. You can walk on your own or with one of the groups. Remember, there are walking groups in the morning and afternoon (6:00 and 3:30) that meet at the main entrance. Come join the fun. We can't wait to see you!

Progress Report
Week 4 Goal: 70,000 Steps
Total Goal: 805,260 Steps
Week 4 Total Progress:
280,000 Steps
140 Total Miles

When health is absent, wisdom cannot reveal itself, art cannot manifest, strength cannot fight, wealth becomes useless, and intelligence cannot be applied. —Herophilus

Tips for choosing sensible portions
When it comes to portion control, we have all been guilty of eating until we make ourselves sick and miserable from discomfort at one time or another. From going back for seconds to cleaning our plate, there are dozens of causes for the expansion of our waist lines. The following are some tips to help pace yourself at meal time. To learn more about portion sizes, refer to “The Food Guide Pyramid” on page 2.

When eating out:
- Choose a “small” or “medium” portion. This includes main dishes, side dishes, and beverages as well. Remember that water is always a good option for quenching your thirst.
- If main dish portions are larger than you want, order an appetizer or side dish instead, or share a main dish with a friend.
- Remain from the “clean your plate club” unless you’re really hungry. If you can, chill the extra food right away, take it home in a “doggie bag.”
- Ask for salad dressing to be served “on the side” so you can add only as much as you want.
- Order an item from the menu instead of the “all-you-can-eat” buffet.

At home:
- Once or twice, measure your typical portion of foods you eat often. Use standard measuring cups. This will help you estimate the portion size of these foods and similar foods.
- Be especially careful to limit portions of foods high in calories, such as cookies, cakes, other sweets, fats, oils, and spreads.
- Try using a smaller plate for your meal.
- Put sensible portions on your plate at the beginning of the meal and don't take seconds.

Tips for Better Walking
Walking is one of the most natural activities in the world, so why do we have so much trouble with it when we try to walk for exercise? We tend to over-analyze our walking. The key to good walking technique is to relax and don't concentrate too hard. Many of us have gotten into the power-walking mentality, and don't walk naturally. Let your arms swing comfortably at your sides. There is no need to rigidly hold your arms at 90 degree angles unless you are walking in a fast pace. Don't allow your arms to cross in front of your body while you are walking. Make all your movements from side to side. This will help keep your stride smooth. While you should be aware of what is directly in front of you and where your next step will be, keep your focus far ahead of you. Remember, looking down slows you down. We hope these three tips will help you to relax and enjoy exercise. Relax your arms, keep a smooth stride, and eyes on the horizon. Happy walking!

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The Food Guide Pyramid

What is a serving?
- Bread, Cereal, Rice, and Pasta Group
  - 1 slice of bread
  - 1 ounce of ready-to-eat cereal
  - ½ cup of cooked cereal, rice, or pasta
- Vegetable Group
  - 1 cup of raw leafy vegetables
  - ½ cup of other vegetables, cooked or chopped raw
  - ½ cup of cooked vegetable juice
- Fruit Group
  - 1 medium apple, banana, orange
  - ¼ cup of chopped, cooked, or canned fruit
  - ¼ cup of fruit juice
- Milk, Yogurt, and Cheese Group
  - 1 cup of milk or yogurt
  - 1 ½ ounces of natural cheese
  - 2 ounces of process cheese
- Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts Group
  - 2-3 ounces of cooked lean meat, poultry, or fish
  - ¼ cup of cooked dry beans or 1 egg counts as 1 ounce of lean meat
  - 2 tablespoons of peanut butter or ½ cup of nuts equals 1 ounce of meat

Source: www.usda.gov

What is Health?

We have been encouraging you to be healthy, but one thing we haven't done is tell you what health is. Is "healthy" merely the absence of disease? Is it being physically able to do the things you enjoy? There are many definitions of health, but few are truly accurate and complete. In their book Understanding Your Health, Payne and Hahn describe health as being much more than the absence of disease. They include seven dimensions of health in their definition, and state that a person is not truly healthy if any of these dimensions is lacking.

The seven dimensions are:
- Physical: Your body is free from disease and capable of performing the tasks required of you.
- Emotional: You can cope with stress and express feelings in ways that are constructive, not harmful.
- Social: You are capable of comfortably interacting with others in a variety of settings.
- Intellectual: You are able to process and act on information around you, making sound decisions. You are open to new ideas.
- Occupational: You spend a significant portion of your life at work. It is important that you enjoy your job and feel like you are contributing to society.
- Environmental: You are able to interact with the physical environment around you and live your life as a good steward of the environment.
- Spiritual: You have a belief system that helps guide you through life. You are able to understand how people base decisions on their beliefs and accept beliefs that aren't your own.

A healthy person is proficient in all seven areas. Perhaps the most important aspect of health is the spiritual dimension. Regardless of what you choose to believe, your beliefs will guide every decision you make. They are the glue that holds the other six aspects of health together. All seven dimensions interact to form your overall health. Each one influences the others. Bee Active primarily addresses the physical dimension of health, but we are here to help guide you through the process of becoming healthy in every dimension. If you have any questions or comments you would like to address, please email us at any time. Sara: sre@msstate.edu

Steven: ssm30@msstate.edu

Website of Interest:
To learn more about healthy eating visit the American Dietetic Association's website at http://www.eatright.com. Here you'll find convenient tips, helpful information, and useful links. And don't forget, March is National Nutrition Month!
Healthy Children, Families, and Communities

Bee Active Newsletter

Issue #3  April 5, 2005

In this edition:
Food Safety ..................... 1
Strong Bones .................. 2
A Healthy Treat .............. 2
Exercise Should be Fun ... 2

The Map is Up!
Don’t forget to stop by the
Sudduth main entrance to
see the map of our route
to Panama City. You can
compare your progress and
see just how far you have
walked. It’s a great place
to find helpful tips and the
latest copy of the Bee Ac-
tive Newsletter.

Spring is here!
Spring is here, and the
weather is beautiful. It’s
the perfect time to join us
for a walk. Even the
spring showers aren’t slow-
ing us down. Only three
times around the school
following the blue line is
equal to about 30 minutes
and over 5500 steps!

Progress Report
Week 6 Goal: 70,000 Steps
Total Goal: 405,200 Steps
Week 6 Total Progress:
420,000 Steps
215 Total Miles

Those who do not find time for exercise will have
to find time to be ill. —The Earl of Derby, 1873

Basics for Handling
Food Safety
Nutrition is not just what
you eat, but how you han-
dle, store, and prepare the
food you eat. Here are
some simple tips to make
sure that the food you eat
is not only nutritious and
delicious but safe as well.

Pour Fight BAC!™
Guidelines to keep food safe:
CLEAN – Wash hands and
surfaces often. Wash your
hands with hot, soapy wa-
ter for at least 20 seconds
before and after handling
food and after using the
bathroom, changing dia-
pers, or handling pets.
Thoroughly scrub hands,
wrists, fingers, and in be-
tween fingers. Rinse
and dry hands with paper
towels or a clean cloth.

SEPARATE – Don’t cross
contaminants. Keep raw
meat, poultry, fish, and
their juices away from
other food. After cutting
raw meats, wash hands,
cutting board, knife, and
counter top with hot, soapy
water.

COOK – Cook to proper
temperatures.

CHILL – Refrigerate
promptly. Always refrigera-
te perishable food within
2 hours.

Thawing
Refrigerator – Allows slow,
safe thawing, but make
sure that the juices from
meat and poultry do not
 drip onto other foods.

Cold Water – This allows
for faster thawing, place
in a leak-proof plastic bag
and submerge in cold tap wa-
ter, changing the water
every 30 minutes. Cook
immediately after thawing.

Microwave – This method
requires that you cook the
meat and poultry immedi-
ately after microwave
thawing.

**NEVER thaw by leaving
products on the kitchen
counter!!

Leftovers
Discard any food left out at
room temperature for more
than 2 hours, (1 hour
if the temperature is
above 90°F).

Place food into shal-
low containers and
immediately put in
the refrigerator or
freezer for rapid cool-
ing.

Use cooked leftovers
within 4 days.

Fridge Safety
Wipe up spills imme-
diately.

Clean refrigerator surfaces
with hot, soapy water.

Once a week, throw out
perishable foods that
should no longer be eaten
(past expiration date).

Did You Know?
20% of consumers don’t
wash hands and kitchen
surfaces before preparing
food. Clean hands and
surfaces are your first step
in safe food handling.

**You can find this information
and more at www.cdc.gov and
www.fda.gov, under food
safety.

Finally, when keeping your
kitchen clean, don’t forget
the little things. Ther-
nometers and lunch boxes
are two often neglected
items when it comes to
do the dishes.

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## Exercise for Strong Bones

One of the biggest concerns for women today is osteoporosis, the loss of bone minerals and density. Bones become fragile and prone to fractures. Exercise, combined with a healthy diet, is one of the easiest and most effective ways to prevent osteoporosis. Just like your muscles, bones respond to exercise by growing stronger. While you can’t see the difference exercise makes to your bones, you also won’t see any signs of osteoporosis. There are few signs or symptoms of osteoporosis. Many people don’t even know they have it until a fracture occurs. Often the only sign is a gradual loss of height over time. Regular physical checkups with your doctor may include bone density tests or other tests designed to identify those at high risk for developing osteoporosis. Weight-bearing exercise, such as walking, is a vital part of prevention, but it is not enough. These exercises only work the muscles and bones of the lower body. Consequently, the only bones that grow stronger are those in the lower body. Other examples of weight-bearing exercises are running, aerobics, stair climbing, and dancing. Swimming and cycling, while good exercise are not weight-bearing and contribute little to preventing osteoporosis. Resistance training is vital to prevent osteoporosis in your upper body as well as your lower body. A healthy lifestyle, including a sound diet, regular exercise, and annual medical exams, is the best prevention for osteoporosis. Remember, risk for osteoporosis increases with age, especially after menopause. It’s never too early to start thinking about prevention. For more information on osteoporosis and how to prevent it, visit the National Osteoporosis Foundation online at www.nof.org.

### Fast Facts from the National Osteoporosis Foundation

- 10 million Americans have osteoporosis, and another 44 million are at risk.
- Osteoporosis is often thought of as an older person’s disease, but people of any age can develop it.
- While the majority of people that have osteoporosis are women, men can suffer from it as well.
- More than 1.6 million fractures occur each year because of osteoporosis.

**Source:** The National Osteoporosis Foundation, www.nof.org

## Oatmeal Banana Coffee Cake

Looking for a nutritious snack that doesn’t taste like the box it came out of? This tasty little treat is the answer. It’s easy to make, tastes great, and is good for you.

### Ingredients:
- 2 ripe bananas
- 1/2 cup oil
- 1/2 cup brown sugar
- 2 eggs
- 1 tsp. vanilla
- 3/4 cup all-purpose flour
- 3/4 cup whole-wheat flour
- 3/4 cup uncooked oatmeal
- 1 tsp. baking powder
- 3/4 tsp. baking soda
- 1/2 tsp. salt
- 1/3 cup milk with 2 tsp. vinegar

Preheat oven to 375. Prepare a 9" square baking dish. Mix all ingredients and pour into prepared dish. Cook 25-30 minutes or until a toothpick inserted into the center comes out clean. Makes great muffins, too!

**Website of Interest:**
[www.scrubclub.org](http://www.scrubclub.org)

This is a great website that is fun and exciting way to teach children about washing their hands for good health. There are many games and features that make this website fun and informative for kids of all ages.

## Exercise should be fun, not work!

There’s no doubt about it, exercise is hard work. You have to work hard to make your body adapt and become stronger. However, that doesn’t mean that you shouldn’t have fun while you’re exercising. After all, you’re not going to stick to it if you aren’t having fun. There are four simple ways to turn exercise from something you dread into something you look forward to. First, exercise with a friend or group of friends. Any activity can be enjoyed if you’re doing it with people you like. Second, choose activities that you enjoy doing. The best form of exercise is the one you’ll stick with. Just make sure you are doing some form of exercise. Third, choose activities that can become part of your lifestyle. A weekly bike ride with your kids or spouse is not only healthy, but quality family time. Last, if “working out” just isn’t your thing, try to incorporate physical activity into your current hobbies. If you like photography, don’t go power walking, pick up your camera and go in search of photo opportunities. Leave the cart at the clubhouse for your weekly golf game. Tending a garden, whether it is flowers or vegetables, is great physical activity. The important thing is to find a form of physical activity you enjoy and stick to it!
Healthy Children, Families, and Communities

Bee Active Newsletter

Issue #4

April 19, 2005

In this edition:

New Information: 1
Food Costs: 1
Food Diary: 2
More Information: 2
Healthy Alternatives: 3

Warm Weather Workout Tips:

With the weather warming up, here are a few tips to keep in mind to stay cool and active.

- Wear light-colored clothing.
- Carry a bottle of water with you on long walks, runs, or rides.
- Drink plenty of fluids throughout the day. Don’t wait until you’re dehydrated to get a drink.
- If you’re sensitive to the heat, avoid working out in the afternoon. Walk in the cooler morning or evening hours.

Man’s most judicious trait is a good sense of what not to believe. ~Euripides, 480-466 BC

With today’s technology, information is always at our fingertips. Health information is available from dozens of sources, including online, in magazines, on television, and even from friends and family. Unfortunately, not all of these sources are reliable.

The question becomes how do we distinguish between good and bad information? When you receive new information, the first step is to consider the source. Is the source reliable? Websites, magazines, and TV shows may or may not be reliable sources of information.

Physicians, registered dieticians, and other health professionals who are overseen by a governing body are usually reliable sources of information. These professionals are held to high standards and face strict consequences for dispensing false or unproven information. As professionals, they also have access to numerous sources of up-to-date information.

Other sources for reliable information include professional organizations such as the American Cancer Society, the American Diabetes Association, and the National Osteoporosis Foundation and their websites.

The second thing to consider is what kind of source it is. Are you getting the information from a primary source or secondary source? The more people the information passes through, the more likely it is to be misinterpreted or construed.

If you hear about a study or new finding, look up the original source. Your local library often has access to original sources. You can also contact your local health professional with questions about new information.

The last question to ask is does the information make sense? If it sounds too good to be true, it probably is. If it doesn’t sound logical or healthy, there’s a good chance it may not be. It’s always important to use good judgment and common sense when interpreting any information, especially when it affects your health.

Finally, never rely solely on one source. Getting a second opinion is just as important when changing your diet or lifestyle as it is when facing a medical surgery. Even the best medical experts make mistakes from time to time. Getting a second opinion or checking multiple sources that support the same conclusion will help minimize misinformation.

Never stop asking questions and striving to learn more about health and wellness. This is a topic that affects all of us and always will. The more informed you are, the healthier you will be.

Controlling Food Costs

Tips to help save money and eat healthily:

- Make a plan of meals and meals you want to have for the week, checking your pantry and refrigerator for those items you already have.
- Check newspaper ads and flyers to see what is on sale and to help with planning of the meals.
- Write a list of the foods you need to buy and put the items in order or groups that the grocery store is sectioned in for faster shopping.
- Bring the list with you! Studies show that without a list, you spend almost twice as much. Only buy the items on your list, unless an item is on sale and you know you will use it.

- Do not go to the grocery store hungry! If you go hungry, everything is going to look good and you’ll end up purchasing more than you intended.

This information was adapted from the University of Connecticut Cooperative Extension Service.
FAD DIETS - Are you a victim?

Wouldn't it be great to find that one miracle diet that lets you eat anything and everything you want? Just to wake up one morning and BAM! 10 pounds just melted off during the night. Fad Diets are those diets that make us all think that we can drop pounds quickly with a snap of a finger, with no consequences. If you really stop and think about these Fad Diets, you can see why they don't work.

There's the Atkins Diet that suggest eating low carbohydrates and high protein, i.e., eating a pound of bacon with eggs smothered in cheese and ham for breakfast really better for you than a cup of oatmeal with a piece of fruit? Many have succeeded with this diet, but it hasn't been around long enough to recognize if there are any long term unhealthy side effects.

The Cabbage Soup Diet is a famous diet that promises a 7-10 pound weight loss in a week. On this diet, you can eat as much cabbage soup as you want, on the pretense that it helps you burn fat. This diet allows you to eat a limited variety of food along with the soup, depending on what day it is. One day, you can eat vegetables along with your soup, another day fruit. You can even drink as much milk as you want on another day! And on days five and six, you get to eat meat. Each day is a new diet with different restrictions. But once that week is over and you begin to eat like you did before, the weight come back. This weight loss is mostly due to loss of water weight. You weigh less because you are often dehydrated.

Another favorite diet plan is the one that involves a pill every 3 hours and increasing the number of pills as the weeks go by. These diets are often endorsed by celebrities that have lost a dramatic amount of weight. What you usually don't see is the personal chef, personal trainer, and insane schedule that helped in the weight loss. Also, don't forget to read the fine print. There are almost as many side effects from some of these pills as there are fad diets.

When the next big diet plan comes onto America's attention and promises quick results, think to yourself: Is it really healthy? What are the possible side effects? Does it follow the recommendations of The Food Guide Pyramid and The Dietary Guidelines? A diet that claims to help you lose weight quickly and easily is usually not one that will keep you healthy.

What do I do with conflicting health information?

So you've done your homework, checked all your sources and some of the information still doesn't make sense. You've found two valid sources that state the complete opposite of each other. One source says you should work out six days a week, another three. This source says you should eat one way, that source says another. And all of the information is written by doctors! This is an ever-growing problem, and there is no easy solution to it.

The problem is that new theories are developed on an almost daily basis. These theories spread quickly through television, the internet, and even through best-selling books from authors trying to supplement their income. Unfortunately, not all of these theories are comprehensively tested before people start trying them. The scientific process is, by its nature, slow. It takes a long time to collect and study information, especially about long-term effects. This means that those two conflicting sources may both be right. Or they could both be wrong. Some information could apply only to people with certain characteristics (all men or only Hispanics).

When trying to decide which information applies to you, it never hurts to consult a professional. Many will answer simple, everyday questions for free.

Finally, when in doubt, stick to the most proven information. The food guide pyramid is a proven guide for eating healthy. If you stick to it and maintain an active lifestyle. Recent information from the American College of Sports Medicine or the National Strength and Conditioning Association has been tested over many years. In addition to providing information on tried and true healthy habits, these groups are excellent sources for up-to-date information on new theories as well.

Alternatives for Refined and Processed Foods

<table>
<thead>
<tr>
<th>Refined Processed Foods</th>
<th>More Nutritious Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soda, soft drinks, fruit drinks</td>
<td>Unsweetened fruit juice, water, low fat milk</td>
</tr>
<tr>
<td>Sweetened cereals</td>
<td>Whole grain and unsweetened cereals</td>
</tr>
<tr>
<td>Cakes, cookies, brownies</td>
<td>Whole or corn muffins, homemade bread, whole grain cookies</td>
</tr>
<tr>
<td>Candy</td>
<td>Mix of dried fruit, nuts and sunflower seeds</td>
</tr>
<tr>
<td>Whipped topping</td>
<td>Small amount of low fat vanilla yogurt or frozen yogurt</td>
</tr>
<tr>
<td>Snack chips</td>
<td>Homemade popcorn, lightly salted, unsalted nuts</td>
</tr>
<tr>
<td>Salad dressing</td>
<td>Make your own with oil, vinegar, low fat mayonnaise or plain yogurt</td>
</tr>
</tbody>
</table>
Healthy Children, Families, and Communities

Bee Active Newsletter

Issue # 1 May 3, 2005

In this edition:
MyPyramid…………………1
How much exercise…………2
Small Changes……………2
Low-Fat Substitutes………2

Caution!!
The website for the new food guide pyramid is MyPyramid.gov. There is another website called mypyramid.org that is not the same! These websites have similar addresses and even look very much alike, but you will not find valid, helpful nutritional information at mypyramid.org!

Don’t Forget
If you have any questions about nutrition or physical activity, you can email Sara, sre@massachusetts.edu, or Steven, sum20@massachusetts.edu, any time.

Progress Report
Week 10 Goal: 70,000 steps
Total Goal: 800,000 steps
Week 10 Total Progress: 700,000 steps
350 Total Miles
We’re now working on week 11 of our trip.

To eat is a necessity, but to eat intelligently is an art.
~Francois La Rochefoucauld

Big News!! There is a brand new Food Guide Pyramid, and it was just released April 14, 2005. According to the USDA, the new MyPyramid symbolizes a personalized approach to healthy eating and physical activity.

The food you consume can still be categorized into the traditional food groups: grains, vegetables, fruits, milk, and meat & beans, but now the pyramid is divided into vertical triangles depending on your body.

How much you consume depends on your age, gender, and physical activity level.
The new MyPyramid website, www.mypyramid.gov, will even calculate your needs for you. Just go to the website, type in your age, sex, and physical activity level, and your calorie needs will be estimated for you. It will then illustrate for you how much food from each food group you should be consuming each day.

There are also menu suggestions, meal patterns, and worksheets available to print out. When looking at the new pyramid, remember that the basic principles have not changed. The new pyramid is a revision of the old one. It has only been revised in order to be more specific and more personalized to you!

There are four important themes in the new MyPyramid.

1. Moderation: Notice that the food group triangles that make up the MyPyramid are wider at the bottom and get narrower as they go up to the tip of the pyramid.

2. Variety: The wider base represents foods with little or no added fat or added sugar. It is wider to show that you should choose these foods more often. The narrow top area represents foods within each group that contain more added sugars and added fats. These less healthy foods should be eaten less often than the foods from the base. The more active you are, the more of these foods you can fit into your daily food choices.

Take grains for example. Cooked (not oatmeal) would be at the bottom, then unenriched instant oatmeal with raisin oatmeal cookies, and at the top, oatmeal cookies with chocolate chips and frosting! Get the picture?

1. Proportionality: This is represented by the different width of the food group bands. The widest band is grains, then vegetables and milk. Fruit is wider than meat and beans.

Oils are in the skimmed milk band. The widths suggest how much food a person should choose from each food group. These are just general guides. How much from each food group YOU need depends, again, on your age, gender, and activity level.

Variety: The MyPyramid includes 6 bands, representing the 6 food groups and oils. This is to show that foods from all groups are needed each day for good health. Each food group makes a distinct contribution to meeting your nutritional needs. All are needed. Oils are included for the first time because research shows that vegetable oils and oils in some fish contain fatty acids that are important for health.

Gradual Improvement
Thankfully, the USDA recognizes that no one can make the changes in their diet and activity patterns overnight in order to follow their MyPyramid recommendations. One small step at a time...steps to a healthier you...can be important to making great improvements in your health.

USSA and information from an article by Linda T. Evans, Nutritionist and EPine Prog program Director.
How much exercise is enough?

It's common knowledge that exercise is important to our health. It's so important that the new MyPyramid includes physical activity as a vital part of dietary guidelines! With all this emphasis on exercise and physical activity, it is inevitable to wonder just how much physical activity is necessary for good health.

The terms exercise and physical activity are often used interchangeably, but they aren't exactly the same thing: Exercise is a specific type of physical activity. It is physical activity that is performed for the purpose of improving fitness or health. Just as there are many forms of physical activity, there are many forms of exercise as well. There are three general categories of exercise that we'll be discussing: strength or aerobic exercises, resistance exercises, and flexibility exercises.

Making small changes has a bigger impact??

The new MyPyramid will not only take time to understand, but adapting it to YOUR specific lifestyle will take work. You must remember that making lasting lifestyle changes takes much time and effort. Setting realistic goals is the first step in changing your lifestyle successfully. The best way to start is to look at what you are eating now and how much. Many of us do not realize just what we consume and have a misconception of how much we are eating in a day. Write down what and how much you eat each day for a week to get an accurate idea of what you are consuming.

After visiting the MyPyramid.gov website and calculating YOUR recommended intake, compare your weekly intake to what is recommended. Make a list of several small changes that you could make to your diet to better fit the MyPyramid. For example, if you are not getting enough vegetables in your diet, try including a small side salad with every lunch or dinner occasionally. Switching from white bread to whole grain bread is another simple way to improve your diet. Taking small steps, making small changes one at a time, is the best way to improve your diet.

If you are trying something at the same time, you are more likely to become frustrated and give up. So try making a small change each week to better your health and lifestyle.

Low Fat Substitutes

When cooking and baking for family and friends, here are some suggestions for making these ordinary recipes a few calories lighter:

- Always consider baking, grilling, steaming, and roasting instead of frying.
- Use low fat or skim milk instead of whole or 2% milk.
- Use two egg whites or 1/4 cup of egg substitute instead of whole eggs when cooking.
- Try low fat cheese or those made from 2% milk, replacing those cheeses made from whole milk.
- Creamy base salad dressings like blue cheese and ranch can be substituted with oil and vinegar or reduced calorie dressings.
- Full fat ice cream can be substituted with low fat frozen yogurts or sherberts.
Healthy Children, Families, and Communities

Bee Active Newsletter

Issue # 6

May 17, 2005

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Mark your Calendar

Data Collection

Following convocation on Friday, May 20th (approx. 9:00), please stop by the Activity Room for measurements and receive a Sudduth Bee Active T-shirt for your participation.

Luncheon

You are invited to a luncheon for all teachers and staff on May 20th at 11:00 in the Sudduth Cafeteria. Come and enjoy lunch with your fellow coworkers.

Progress Report

Week 13 Goal: 70,000 Steps
Total Goal: 806,000 Steps

We've Made It – If you have gone the recommended 70,000 steps per week, you have made it to Panama City, Florida! Congratulations on your accomplishment!

CATCH IS COMING!!

The Coordinated Approach to Child Health Program (CATCH) is coming to Sudduth in the fall. CATCH is the leading coordinated school health program in the country. It was developed as the result of a national research program to improve the health of children.

Since its development in 1996, CATCH has been successfully implemented at schools all over the country. The purpose of the CATCH program is creating healthy children and healthy school environments.

CATCH helps schools build an alliance of parents, teachers, child nutrition personnel, school staff and community partners to teach children and their families how to be healthy for a lifetime. CATCH has four components that help schools do this: the Go for Health classroom curriculum, CATCH physical education, Eat Smart School Nutrition Guide, and family Home Team activities.

Health is a large word. It embraces not the body only, but the mind and spirit as well...and not today's pain or pleasure alone, but the whole being and outlook of man. ~James H. West

When combined, these four components reinforce positive health behaviors throughout a child's day, and good health is key to learning.

CATCH is unique in its broad scope. Healthy habits cannot be learned solely at home or at school. Parents and teachers have strong influences because of the amount of time they spend with the children. Children are learning throughout the entire day.

Sudduth Elementary has an important role to play in bringing school health programs to Mississippi. Mississippi children are among the most unhealthy in the nation. Sudduth Elementary has the potential to serve as a model school in the state for improving children's health.

In addition, CATCH is in the process of expanding their curriculum. What started out as a research project in only 3rd grade has expanded to include kindergarten through fifth grade. How do they know what works so they can continue to expand? They respond to the feedback of participating schools. Because of this, each school plays an important role in improving the health of children across America.

CATCH training will be August 1st and 2nd, with implementation beginning in the fall. Let's work together to make the best elementary school in Mississippi even better.

**This information and more can be found at the CATCH website: www.phhs.dhs.ms/education/catch**

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Summer Fun Recipes

Recipes provided by Spina Byrd, Ph.D., R.D., L.D.

Want a simple way to increase your intake of vegetables? Try this yummy Veggie Sandwich recipe.

1/2 cup chopped onion
2/3 cup chopped cucumber
2/3 cup grated carrots
1/3 cup chopped celery
1/3 cup chopped bell pepper
8 oz cream cheese (light or nonfat)
3 tablespoons of light/low fat mayonnaise
1 tablespoon lemon juice

Mix all ingredients and spread on whole wheat bread!! Tip: Chop the veggies by hand. Do not use food processor, because it makes it watery. So grab your knife, watch your fingers, and enjoy this delicious, healthy treat.

Want to increase fiber? Calico Bean Bake is an easy alternative for baked beans.

1/2 cup onion, sauté slightly, drain and put into bowl

Add the following items to bowl and mix well: 1/2 tsp ketchup, 1/4 cup brown sugar, 1 tsp dry mustard, 2 tsp vinegar, 1/3 cup white vinegar

Sprinkle: 1 can pork and beans, 1 can kidney beans drained, and 1 can giant lima beans drained.

Bake for 40 minutes at 350° or until thickened. It makes a delicious side for burgers, chicken, or anything on the grill.

Hawaiian Chicken Salad adds the taste of summer to your day!

2 qt. chopped, cooked chicken
2 cups celery, diced
1 (19 oz) can water chestnuts, sliced
1 lb seedless grapes, cut in half
2-3 cups toasted almonds, sliced
3 cups mayonnaise (or 2 cups non-fat sour cream and 1 cup fat free mayo)
1 Tablespoon curry powder
1 Tablespoon soy sauce
1 teaspoon lemon juice

Leaf lettuce

Combine chicken, celery, water chestnuts, grapes and almonds in a large bowl. In a separate bowl mix mayonnaise, curry powder, soy sauce, and lemon juice. Add mayo mixture to the chicken/fruit mixture and chill several hours or overnight. When ready to serve, place on leaf lettuce and garnish with almonds and pineapple chunks. Yields 18 servings.

Produce for Better Health

5 A Day the Color Way is the Produce for Better Health Foundation’s way of promoting fruit and vegetable intake. For the past decade, their mission has been to create a healthier America. From 1991 to 2004, $600 million was spent on promoting the 5 A Day to increase fruit and vegetable consumption. They say “it is all about color” – and the power of colorful fruits and vegetables to promote good health and boost sales. And the best news is that eating a variety of colorful fruits and vegetables can reduce your risk for heart disease and some cancers.

To learn more, visit www.5aday.org

Have a Wonderful Summer!

The end of yet another school year is upon us. This is a time to celebrate accomplishments and get ready to enjoy a well-earned summer break. It’s also a time to reflect back over everything that has happened during the school year. For the Healthy Children, Families, and Communities research team, it has been a great year! For the Bee Active walking team, it’s been even better. It’s been a pleasure to meet and get to know many of you this year. We hope that the Bee Active program has encouraged you to be more active. Thank you for your participation, and we hope you’ve gotten as much out of the program as we have. We encourage you to continue to ‘Bee Active’ throughout the summer. We look forward to seeing you in the fall. Have a great summer, and happy walking!

Bee Active Program Directors