IMPACT OF THE RED CEDAR MEDICAL CENTER COMMUNITY WALKING PROGRAM

by

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ABSTRACT

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Obesity is an epidemic in the United States. Many walking programs have been started all over the country, but there has been little research published addressing the effectiveness of the walking programs. The purpose of this study is to examine the impact of the Red Cedar Medical Center Community Walking Program. In a quasi-experimental study, 230 (45 men and 184 women) participants returned a survey which identified reasons for enrolling in the walking program, motivators, and barriers. Men participated longer in the walking program. The number one reason for enrolling in the program was to lose weight, and 49% of the participants reported that they lost weight. The greatest barrier identified was time and the greatest motivator identified was improved health. Fruit and vegetable consumption increased. And, 95% of the participants said they would

recommend the walking program to a friend. The Red Cedar Medical Center Walking Program was effective in helping people reach their goals. The present study also provided feedback from the participants to help make improvements to future programs

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CHAPTER I: INTRODUCTION

There have been many walking programs started all over the country in an attempt to get people to become physically active and to reduce and prevent obesity. Even with these efforts, the obesity epidemic continues to be on the rise. People all over the world are wearing pedometers to increase their daily step counts to 10,000 steps/day. But, are the walking programs and pedometers making a difference? The popular literature has stated that pedometers are good motivators that have helped people reach 10,000 steps/day by providing immediate feedback (Schnirring, 2001). The literature continues to encourage people to aim for 10,000 steps/day and provides ideas on how to accomplish this (McCarthy, 2002). And recently, a top government official suggested that the federal government should put money behind walking programs (Hellmich, 2003).

Statement of the Problem

Research has shown that physical activity may reduce the risk for many chronic diseases including coronary heart disease (CHD), hypertension, non-insulin dependent diabetes mellitus (Haskell, 1994; Pate, et al., 1995), osteoporosis, colon cancer, and anxiety and depression (Pate et al., 1995). It has been recommended that every US adult should accumulate 30 minutes or more of moderate-intensity physical activity on most, preferably all days of the week (US Department of Health and Human Services, 1996). Unfortunately, 40% of adults in the United States report they do not participate in any regular physical activity as discussed by Healthy People 2010 (US Department of Health and Human Services, 2000). Walking is an effective way to help people establish a consistent, life long, exercise program that has been shown to produce health benefits (Rippe, Ward, Porcari, & Freedson, 1988).

An estimated 64% of adults in the United States are either overweight or obese (US Department of Health and Human Services, 2004). Obesity increases morbidity and mortality risk and is associated with an increased risk for: high blood pressure, high cholesterol, cardiovascular disease, insulin resistance, type 2 diabetes, gallstones, respiratory disease, arthritis, and some types of cancer (Pi-Sunyer, 1993).

Purpose of the Study

The purpose of the current study is to determine the impact of the Red Cedar Medical Center Community Walking Program.

The specific objectives for this study are:

1. To determine the characteristics of the participants in the walking program
2. To determine the participants' reasons for enrolling in the program, the goal(s) they chose and how they progressed towards their goal(s)
3. To measure the participants' self-efficacy and to see if it effects success in the program
4. To identify the participants' motivators
5. To identify the participants' barriers and rank their importance
6. To determine if the participants' fruit and vegetable consumption improved
7. To determine if the participants are still using their pedometers
8. To determine if the participant will recommend the walking program to a friend
9. To determine factors that effect success in the walking program

Assumptions of the Study

Since the survey was not distributed until the program had been completed for approximately nine months, one assumption is that the participants' feelings about the walking program did not change from the time they completed the program until they completed the survey.

Definition of Terms

The following terms are defined for the purpose of this study.

Body Mass Index (BMI): a means for indication weight status in adults, it is a measure of weight for height (CDC, 2003).

Physical activity: any bodily movement produced by skeletal muscles that result in energy expenditure (Pate et al., 1995).

Self-efficacy: the belief in one's ability to produce given attainments (Bandura, 1997).

Limitations of the Study

One limitation of the study includes timing of the survey. The participants completed the survey fifteen months after the program had been started. A second limitation of the study is that all data was self-reported instead of measured by the researcher. A third limitation of the study is that there was no control group.

Methodology

A survey was developed and distributed to the local businesses that participated in the walking program. Because of the HIPPA law, individuals who signed up for the program through the hospital could not be contacted. The researcher delivered and picked up the surveys at the businesses. Data were analyzed using SPSS version 11.5 for Windows.

CHAPTER II: LITERATURE REVIEW

The literature review starts by discussing the obesity epidemic. The next topic covered is physical activity, followed by how physical activity can reduce the risk for certain diseases and the benefits and barriers to participating in physical activity. The next section of the literature review discusses variables that effect or are a part of programs that encourage physical activity. And lastly, walking programs are discussed followed by the program in the current study, the Red Cedar Medical Center Community Walking Program.

Obesity

Obesity continues to be a problem in the United States; it has been called an epidemic. Approximately 300,000 deaths in the US each year are linked with overweight and obesity (US Department of Health and Human Services, 2001). Adults with a BMI (body mass index) of 30 or above are considered obese, those with a BMI of 25-29.9 are considered overweight (CDC, 2003). Obesity increases morbidity and mortality risk and is associated with an increased risk for: high blood pressure, high cholesterol, cardiovascular disease, insulin resistance, type 2 diabetes, gallstones, respiratory disease, arthritis, and some types of cancer (Pi-Sunyer, 1993). The prevalence of obesity increased from 12% in 1991 to 17.9% in 1998 (Mokdad, et al., 1999). And, obesity rates have increased more than 60% in adults in the past ten years (US Department of Health and Human Services, 2003). Obesity rates have doubled in children and tripled in adolescents since 1980. In a press release, Surgeon General David Satcher stated "Overweight and obesity may soon cause as much preventable disease and death as cigarette smoking" (US Department of Health and Human Services, 2001, para. 4).

A study using data from the Third National Health and Nutrition Examination Survey (NHANES III) found that approximately 63% of men and 55% of women age 25 and over were

overweight or obese (Must et al., 1999). High blood pressure was the most common overweight and obesity related health risk. The prevalence of type 2 diabetes, osteoarthritis, and gallbladder disease increased in both overweight and obese men and women.

Hill and Peters (1998) studied environmental factors that are contributing to the obesity epidemic. They believe that overeating and lack of physical activity cause obesity. Foods that are dense in fat and calories, not to mention taste good, are readily available almost everywhere and "super sizing" has become the norm and not the exception. Technological advances have reduced the need for physical activity in our daily lives. Time spent in front of the television and computer continues to increase. Hill and Peters (1998) believe that the environment must change in order to battle the obesity epidemic. They have suggested three major ways to promote behaviors that defend against obesity. One way is to educate consumers about portion sizes; a second way is to increase the availability of foods that are lower in fat and calories, and a third way is to increase the physical activity of the general public. To begin to combat the obesity epidemic, partnerships must be developed among educators, government, and industry.

Hill, Wyatt, Reed, and Peters (2003) feel a more realistic public-health goal is to stop weight gain, instead of reducing the number of overweight and obese Americans. To prevent weight gain, they have identified the "energy gap," which is the amount of energy needed to stop the weight gain of the population, whether it is through increased physical activity or reduced caloric intake. They have estimated that the energy gap to be 100 kcal/day. One may prevent weight gain either through increased activity or reduced caloric intake, by 100 kcal/day. This proposed calorie amount needs to be experimentally tested. Again, they have identified two possible tactics for closing the energy gap, increasing physical activity and reducing portion size. Walking an extra mile each day, which would take most people about 15-20 minutes, could

increase energy expenditure. A mile of walking is about 2000-2500 steps, so an extra mile could be accumulated throughout the day by taking the stairs or parking at the far end of the parking lot at the grocery store. Caloric intake could be reduced by eating a few bites less at each meal, changing a snack of a candy bar to a piece of fruit or eliminating an unneeded snack during the day. Unfortunately children are not immune to the obesity epidemic. It is not known if the energy gap in children is 100 kcal/day, but it is important that we include them in the fight against obesity.

Physical Activity

It has been recommended that every US adult should accumulate 30 minutes or more of moderate-intensity physical activity on most, preferably all days of the week (US Department of Health and Human Services, 1996). One way to do this is to walk two miles briskly (Pate et al., 1995). Walking is an effective way to help people establish a consistent, life long, exercise program that has been shown to produce health benefits (Rippe et al., 1988). Intermittent activity can also produce benefits, like walking up stairs, doing calisthenics, or pedaling a stationary bicycle (Pate et al., 1995). Other activities such as gardening, housework, raking leaves, and dancing can contribute to the 30 minutes per day total if they are done at intensity similar to brisk walking.

Research has shown that physical activity may reduce the risk for many chronic diseases including coronary heart disease (CHD), hypertension, non-insulin dependent diabetes mellitus, (Haskell, 1994; Pate et al., 1995) osteoporosis, colon cancer, and anxiety and depression (Pate et al., 1995). In both younger and older adults, lower mortality rates are linked to higher levels of regular physical activity (US Department of Health and Human Services, 1996). Studies have also shown that low levels of physical activity are associated with increased mortality rates (Pate

et al., 1995). Caspersen, Powell, and Christenson (1985) defined exercise as "planned, structured, and repetitive bodily movement done to improve or maintain one or more components of physical fitness" (p. 129). Research has found that exercise improves CHD risk factors, blood lipid values, blood pressure, body composition, glucose tolerance and insulin sensitivity, bone density, immune function, and psychological function.

Forty percent of adults in the United States report they do not participate in any regular physical activity (US Department of Health and Human Services, 2000). Just 15% of adults report physical activity for 5 or more days per week for 30 minutes or longer. And, only 23% of adults report regular, vigorous physical activity for 20 minutes or longer 3 or more days per week. Furthermore, for those who begin an exercise regimen, 50% of them will cease exercising within six months (Falls, Baylor, & Dishman, 1980).

A study conducted by Colditz (1999) estimated that the lack of physical activity contributed to 22% of coronary heart disease, 22% of colon cancer, 18% of osteoporotic fractures, 12% of diabetes and high blood pressure, and 5% of breast cancer costs. In 2000, physical inactivity was associated with more than $76 billion in health care costs (US Department of Health and Human Services, 2003). Billions of dollars could be saved in heart disease costs if only 10% of adults started a regular walking program.

Women are more likely than men to report no leisure-time physical activity, and older adults report less physical activity than younger adults (US Department of Health and Human Services, 2000). Generally, people with lower levels of education are less active in their leisure time.

Influences on physical activity patterns include self-efficacy, support from others, enjoyment of physical activity, perceived benefits of physical activity, and lack of perceived barriers to being physically active (US Department of Health and Human Services, 1996).

Disease

In Japan, walking has been shown to be an effective means of treatment in obese non-insulin dependent diabetes mellitus (NIDDM) patients for weight loss and improved insulin sensitivity (Yamanouchi et al., 1995). Obese NIDDM patients were placed into two groups, one group changed diet only and the other changed diet and was instructed to walk at least 10,000 steps/day. The group who changed both diet and exercise had greater reduction in body weight and increased insulin sensitivity. Another study found that 12 weeks of walking increased the fitness and decreased total cholesterol in postmenopausal women who have or are at risk for type 2 diabetes (Walker et al., 1999).

A study found that a 24-week walking program meeting the American College of Sports Medicine and the Centers for Disease Control and Prevention minimum physical activity recommendation is effective in lowering systolic blood pressure in postmenopausal women with borderline to mild hypertension (Moreau et al., 2001). Pedometers were utilized to help women achieve their walking prescription and allowed researchers to document that the women were increasing their daily walking compared to their usual daily lifestyle in a study that found that walking could reduce blood pressure.

A preliminary evaluation of the First Step Program, an intervention developed to increase daily physical activity in adults with type 2 diabetes, found that the participants had increased their walking and improved systolic blood pressure, but did not improve their diastolic blood pressure (Tudor-Locke, Meyers, Bell, Harris, & Rodger, 2002).

Older women with moderately elevated serum cholesterol who participated in a supervised walking program had significantly lower cholesterol levels related to walking after 12 months (Ready, 1996). Another study found that women who walked and participated in vigorous exercise had substantial reductions in incidence of coronary events (Manson, Hu, Rich-Edwards, Colditz, & Stampfer, 1999). The risk of coronary events in women could be reduced by 30 to 40 percent if a regular program, such as brisk walking for three or more hours per week, were adopted. Increased walking time or walking combined with other vigorous exercise appeared to be associated with even larger risk reductions. The researchers estimated that one third of the coronary events among middle-aged women in the US are accredited to lack of physical activity.

Benefits and Barriers

A study conducted by Tucker and Reicks (2002) in adults 65 years and older found that the most common benefits to exercise were benefits for overall health and improved strength and balance. The most common barrier was pain, making it difficult to exercise. Time has been found to be the number one barrier sighted for not increasing physical activity (Lindberg, 2000; US Department of Health and Human Services, 2000). Other barriers people face when trying to increase physical activity are access to convenient facilities and safe environments in which to be active (US Department of Health and Human Services, 2000).

Self-efficacy

Self-efficacy is the belief that one has in their ability to produce a given attainment (Bandura, 1997). Self-efficacy beliefs have been linked to the performance of many behaviors. Miller, Ogletree, and Welshimer (2002) found that activity level was predictive of self-efficacy; the participants who were more active had higher self-efficacy. The authors suggested that when

people begin an exercise program, they should be encouraged to set a long-term goal of vigorous activity which may lead to greater self-efficacy and in turn will lead to greater adherence to an exercise program. Exercise self-efficacy and perceived barriers to activity were the most significant predictors of exercise and calcium intake in a study done on women (Wallace, 2002). A study conducted with women between the ages of 20-85 found that age was negatively related to exercise self-efficacy; older women had lower self-efficacy (Wilcox & Storandt, 1996). Self-efficacy had a significant influence on a timed mile walk; as self efficacy increased, the time to walk one mile decreased (Nies & Kershaw, 2002), suggesting that the greater one's belief to perform a given activity, the better the performance. The same study found that higher self-efficacy was related to lower BMI, but was mediated by the time to walk one mile.

It is expected that one's self-efficacy should increase as one becomes more experienced and familiar with an activity. Self-efficacy scores had an unanticipated decrease in the Speck and Looney study (2001), in that both the intervention and the control group self-efficacy was lower after the intervention than before. The authors attributed the decline in self-efficacy to the participants' increased awareness of the barriers that affected their ability to maintain physical activity during the study.

Studies indicate that self-efficacy can predict exercise adherence (Dzewaltowski, Noble, & Shaw, 1990; McAuley & Jacobson, 1991; Marcus, Eaton, Rossi, & Harlow, 1994; Oman & King, 1998). The purpose of the Oman and King (1998) study was to explore the associations among self-efficacy, changes in self-efficacy, past exercise participation, future exercise adherence, and exercise program type (home-based or class-based). Self-efficacy was assessed at week two and at one year, of the two-year study. Their results revealed that self-efficacy and program type had significant, but independent effects on exercise adherence during the adoption

and early maintenance stages. Baseline self-efficacy, independent of past exercise adherence, significantly predicted exercise adherence during the adoption phase, but not early maintenance phase. However, past exercise program adherence was the strongest predictor of future exercise program participation. The participants in the home-based program had higher self-efficacy and exercise adherence than the class-based participants. No significant connections were found between changes in self-efficacy and changes in adherence. However, changes in adherence during the adoption phase of exercise predicted self-efficacy level at year-one after adjusting for baseline self-efficacy, which may support the idea of a reciprocal relationship between past adherence and self-efficacy. The authors suggested that self-efficacy may be increased by ensuring that an individual's early exercise experiences are encouraging. Bandura (1986) suggested that prior experiences influence self-efficacy, and in turn, self-efficacy influences future behaviors.

Stages of Change

Individuals beginning a new behavior progress through the stages of Precontemplation (not intending to make a change), Contemplation (considering a change), Preparation (making small change), Action (actively adopting the new behavior), and Maintenance (carry on the change over time) (DiClemente, et al., 1991). In the present study, the participants' stage of change was not determined. Self-efficacy is associated with stage of change in physical activity (Marcus & Owen, 1992; Marcus, Selby, Niaura, & Rossi, 1992; Leenders, Silver, White, Buckworth, & Sherman, 2002). Although a clear differentiation was not determined, a person who is in a later stage of the stages of change model tends to have higher self-efficacy (Marcus et al, 1992). The authors suggested that individuals at the various stages would benefit from different intervention programs that focus on improving self-efficacy. Marcus and Owen (1992)

found that precontemplators had significantly lower self-efficacy than the subjects in the other stages.

Pedometer

A pedometer is a device worn on the belt or waistline used to measure distanced walked. One advantage of a pedometer is that it is small and relatively low in cost. A pedometer provides immediate feedback and may be used as a behavior modification tool. A limitation of pedometers is that they do not store data over a period of time and they cannot distinguish between walking and running (Freedson & Miller, 2000).

A study by Basset et al. (1996) examined the accuracy of five different pedometers. They found that the Yamax Digi-walker DW-500 was the most accurate. The study also found that it does not matter what side of the body the pedometer is worn on, and different walking surfaces such as a concrete walking surfaces or rubberized track did not affect pedometer accuracy. Although the Yamax DW-500 has been discontinued, an alternate model, the Yamax SW-200, has been tested by Bassett (2000) and performed similarly to the Yamax DW-500 pedometer.

Welk et al. (2000) looked at the function of using pedometers to objectively monitor physical activity. There were two parts to their study: 1) to determine the number of steps it took to cover a certain distance at different speeds and different conditions, and 2) to determine the utility of the Digi-Walker to assess activity under field conditions. They found in study 1 that it took 1300-2000 steps to walk or run a mile, no matter the surface. In study 2 the participants wore the pedometer during all waking hours for 1 week and then for 1 week they were to wear the pedometer throughout the whole day, but remove it when they did structured or vigorous activity. They found that those who pursued some form of activity outside of work were more likely to accumulate more than 10,000 steps per day.

A study by Bassett, Cureton, and Ainsworth (2000) evaluated the measurements of daily walking distance on the College Alumnus Questionnaire (CAQ) compared to a pedometer. They found that the subjects under estimated their daily walking distance on the CAQ. Therefore, pedometers can be used to help estimate walking distance on physical activity questionnaires. A preliminary study by Tudor-Locke (2001) found that pedometers were more likely to identify change in physical activity from a walking program than physical activity logs.

A study by Wilde, Siman, and Corbin (2001) suggested that the 10,000 step target may be too high for some sedentary women. The study had three objectives: 1) determine the baseline step counts for sedentary women, 2) determine step counts for 30 minutes of brisk walking, and 3) determine if baseline step counts, plus step count in 30 minutes of brisk walking would total 10,000 steps. On walking days, participants were able to accumulate 10,000 steps per day, but not on nonwalking days. The study found the mean step count for a nonwalking day was 7,200, and 30 minutes of walking for sedentary women was approximately 3,100 steps. So, when added together would total more than 10,000 steps. They concluded that their study did support the 10,000 step count as a challenge for women who are sedentary, but higher or lower targets may be needed based on their baseline step counts.

Activity Records

A study by Speck and Looney (2001) found that keeping daily activity records is a successful intervention to increase the number of steps taken daily. Women in the intervention group were asked to complete daily activity records and the control group did not keep records. All women wore pedometers, which were read by the researchers. At the end of the 12-week study, women who recorded their daily activity had a higher number of daily steps.

Goal Setting

A meta-analysis of 36 studies by Kyllo and Landers (1995) found that setting goals improved exercise performance, suggesting that goal setting is a successful technique for encouraging physical activity. They also found that goal setting may be improved by setting short-term and long-term goals, by allowing the participants to help in setting the goals and by having the participants share their goals with others.

Goal setting, self-reinforcement, and self-monitoring progress add to sustained physical activity (Pate et al., 1995). In a study done with fourth grade students, goal attainment was moderately successful in promoting fruit, juice, and vegetable consumption (Cullen et al., 2004). As part of the Squire's Quest, an adaptation of the Gimme 5 classroom curriculum to increase fruit, juice, and vegetable intake, goals were assigned and not self selected. Another study conducted with adults found that setting goals to reduce health risks is an effective way to change behavior (Alexy, 1985). The study predicted that risk reduction goals would be better attained when the client was involved in setting the goals versus the health care provider setting the goals for the client. However, the results showed that there were no differences between the two groups.

Healthful Eating

The US Department of Agriculture recommends that adults consume at least 5 servings of fruits and vegetables each day (US Department of Agriculture, 2000). Approximately one-fourth of adults, and less than 20% of young people in the US consumes five or more servings of fruits and vegetables each day (US Department of Health and Human Services, 2003). Poor diet is a factor that contributes to over $33 billion in medical costs and $9 billion in lost productivity due to heart disease, cancer, stroke, and diabetes.

Tucker and Reicks (2002) found that adults 65 years and older who were more likely to exercise were more likely to be in the later stages of change for fruit and dairy consumption, but not for vegetable consumption or avoiding fat. They concluded that exercise may be a gateway behavior for some dietary behaviors. They defined a gateway behavior as a "health behavior that, when positively changed, would cause a positive change in another health behavior" (p. S14).

Walking Programs

Colorado on the Move is a statewide program designed to prevent weight gain by increasing physical activity and decreasing energy intake (Wyatt et al, 2004). In this 14-week study, the researchers found that the program significantly increased physical activity by at least 2000 steps/day. Their focus was on preventing weight gain, not treating obesity. The program used electronic step counters and individual goals of increasing the number of steps walked each day by 2000 steps instead of each participant having the goal of reaching 10,000 steps/day. Since the October 2002 launch of the Colorado on the Move program, a national version of the program has begun called America on the Move. More information regarding America on the Move is available at http://www.americaonthemove.org.

HealthPartners, a large managed care organization (MCO) serving more than 800,000 residents of Minnesota, started a pilot program called 10,000 Steps in 1999. The mail-based pilot study lasted for eight months and the participants used a pedometer, a personal action planner, a log to keep track of steps, motivational cards, and an opportunity to win prizes. A focus group identified the most important motivators for increasing their physical activity, which were improved health and increased energy (Lindberg, 2000). They also identified time as their number one barrier for increasing physical activity. After eight weeks, the step logs were reviewed; there was a significant increase in steps from baseline, at week four, and at week eight.

After eight months, the participants returned a survey, 50% of them reported they were using their pedometer at least a couple times per week. The program was highly recommended; all of the participants who returned the survey said they would recommend the program to a friend.

A pilot study investigated the influence of an 8-week, pedometer-based intervention on physical activity. The researcher found that average daily steps increased significantly from 8,565 steps/day at baseline to 10,538 steps/day after the walking program (Croteau, 2004). The participants identified the following things as having the greatest influence on their daily step increase: 1) having step goals and strategies each day, 2) being able to use the pedometer to see how many steps have been accumulated throughout the day, and 3) recording the number of steps taken each day and strategies used in a log. The limitations mentioned in the study included small, self-selected sample, no control group, short duration, and the use of step equivalents to identify other activities such as bicycling for the daily activity log recording.

A 12-month study done in the UK compared reported physical activity between people who attended a seminar covering the health benefits of exercise and recommended levels of exercise and those who participated in the seminar and also lay lead health walks. They found that more people in the group who participated in the lay led walks reported increased physical activity versus those who participated in the advice seminar only, but the difference was not significant (Lamb, Bartlett, Ashley, & Bird, 2000.)

Women, with elevated serum cholesterol, who participated in a 12-month supervised walking program, were followed for one year after completing the walking program. A 3-month, 6-month, and 12-month follow-up was completed. The greatest decrease in walking occurred in the first 3 months (Ready, 1996). The women who had the greatest reduction in serum cholesterol during the supervised walking program were more likely to continue walking after 12

months. The participants stated that they maintained their walking because they felt less tired or felt better, and because they received encouragement from their family and friends. The most often reasons for not walking included lack of time and being injured.

A study measuring adherence in a 24-week home based walking program found that women completed 64% of the expected walks, and adherence to duration and intensity were above 90% (Wilbur, Chandler, & Miller, 2001). A problem noted by the researchers was the ability to get out walking, once the women were walking, they were able to attain the appropriate duration and intensity.

A telephone counseling intervention designed to help sedentary women begin and maintain a walking program seems to be beneficial (Nies, Chruscial, & Hepworth, 2003). Significant differences in BMI or blood pressure were not found between the intervention and control groups. However, within-group analysis showed the intervention group had significant improvement in blood pressure.

A qualitative study was conducted on sedentary, middle aged women with a goal to increase walking to a minimum of 90 minutes per week (Nies, Reisenberg, Chruscial, & Artibee, 2003). The purpose of the study was to examine how the women reacted to the physical activity counseling intervention. The study was part of a larger study, which implemented a walking program to increase physical activity. Thirty one women received 16 phone calls over a 24-week period in which they were asked to reflect on the benefits of walking, goal setting, restructuring plans, social support, exercise efficacy, relapse prevention, and maintenance. Benefits identified by the women included physical and psychological well-being. With regards to goal setting, most women who planned to walk every day had a regular walking routine. Adding a partner was noted as a way to improve their walking habit. Family was frequently identified as social

support, along with coworkers, friends, and neighbors. All of the participants had positive feelings about their walking and were encouraged to build their exercise self-efficacy by using positive statements and self-praise. Identifying benefits of walking was a strategy used to prevent relapse, and making walking a part of their daily routine was the most popular way to maintain their walking program.

A study that included nonexercising, premenopausal females who participated in an eight-week walking program found that the walking group had significant improvement in a timed mile walk, diastolic blood pressure, and self-esteem (Palmer, 1995). There was not a significant improvement in systolic blood pressure. The decrease in diastolic blood pressure and timed mile walk, as well as the increase in VO_2 max indicated that the walking program had significant physical fitness value.

Red Cedar Medical Center Community Walking Program

The Red Cedar Medical Center Community Walking Program was started in April of 2002. For $20.00, an individual received a pedometer, activity log, and was eligible for incentives and prizes. Prizes were given out when individuals reached 100 miles, 300 miles, and 600 miles. The participants also received a folder that contained information on walking guidelines and some walking routes, and a Body Mass Index chart adapted from the National Heart, Lung and Blood Institute. Also included in the folder were caloric values of physical activity, a chart for converting other activities to "steps", and tips on how to eat more fruit and vegetables all adapted from Health Management Resources Corporation. The folder also contained Healthy Weight for Life and Get Fit, Stay Fit published by the Mayo Foundation for Medical Education and Research. The individuals were asked to wear their pedometers everyday and record their steps on the daily log every night. When the individual reached each mile marker

they could turn in their log by email, mail, phone, or in person. The individuals were also challenged to eat five fruits and vegetables each day.

In summary, because of the minimal research conducted on walking programs like the Red Cedar Medical Center Community Walking Program, it is believed that the current investigation being conducted will be able to add to the body of knowledge and spark interest in further research that may help control and reduce the obesity epidemic that is such a problem in our nation.

CHAPTER III: METHODOLOGY

Description of Methodology

A quasi-experimental design was used as the population was selected. The study was conducted in collaboration with the Red Cedar Medical Center in Menomonie, WI. Objectives were determined, the literature was examined, and a survey was designed. Approval for conducting research was obtained from the UW-Stout Institutional Review Board (Appendix A). Subjects who signed up for the Red Cedar Medical Center Community Walking Program were contacted through their place of employment in order to secure their participation. By returning a completed survey, the participant gave his or her consent to participate in the study. There were no identifying factors on the survey.

Subjects

Approximately 1900 people enrolled in the Red Cedar Medical Center Community Walking Program. Individuals as well as businesses signed up for the program. Because of the Health Insurance Portability and Accountability Act of 1996 (HIPAA), we were not able to directly contact individuals who enrolled in the program. We were able to contact the businesses that signed up for the program and ask for their help in distributing and collecting the surveys to the employees who participated in the program. Eight businesses, one school district, a university, and a church group participated in the study.

Instrumentation

A survey consisting of twenty-two questions was developed and administered to voluntary participants from the walking program. The survey collected demographic information such as gender, age, marital status, highest education level attained, ethnicity, and number of children living at home. The survey also asked how the participants heard about the walking

program. The survey asked the reason/goal for enrolling in the program and the progress made towards their chosen goal(s). One of the main variables was the reason(s) or goal(s) for participating in the program. Some of these goals were identified from the informational brochure that was distributed by the Red Cedar Medical Center (Appendix B). Another variable was to determine the self-efficacy of the participants. The self-efficacy questions on the survey were developed from the self-efficacy literature (Cancer Research Center, n.d.; Marcus, Selby, Niaura, & Rossi, 1992). Self-efficacy means confidence in one's ability to perform a given behavior (Bandura, 1997). Equally important to self-efficacy in performing a behavior is barriers to such behavior. Therefore, another variable was barriers that impacted their participation in the program which were adopted from the University of Illinois Urbana-Champaign website (n.d.). Motivators were another variable that was measured. The participants were asked to indicate how each of the following influenced their participation in the walking program: pedometer, prizes, friends, family, calling in the mile markers, recording the daily activity records, improved health, and increased energy. The items were rated using a 5-point Likert scale.

Also included in the study were anthropometric, biochemical, and clinical variables, which included height, weight, cholesterol and blood pressure. The participants were asked their height. They were asked their weight before participating in the program and their current weight, and also their blood pressure and cholesterol before the program and current blood pressure and cholesterol. We asked the participant's height and weight, to determine body mass index (BMI), and see if there were any changes. Since the survey was distributed during the summer of 2003 (and the program began in April of 2002), we questioned how many people would respond to the questions with such a long time between participating and completing the survey.

We wanted to see if the participant's fruit and vegetable consumption changed from before the program, during, and after completion of the program, therefore the survey included variables about fruit and vegetable consumption. The variables of helpfulness and friendliness of the staff were also included. The survey asked if the information provided after signing up for the program was helpful and if the people who answered the phone when miles were called in and prizes were picked up were cordial. Three more variables of significance included reaching the goal mile markers of 100, 300, and 600 miles; how many months the subjects participated; and if they are still using their pedometer. The final variable included recommendation of the program to a friend; the survey asked if the participant would recommend the walking program to a friend. The survey can be found in Appendix C.

A goal achievement score and self-efficacy score were calculated in order to determine if they had any effect on the participants' success in the walking program. The goal achievement score was calculated using question 9 on the survey. Participants were given a score according to how they progressed on the goals they chose. The following scale was used to calculate goal achievement score: 1 = 'made some progress,' 2 = 'made good progress,' and 3 = 'accomplished goal.' All items on question 9 were used except for 'prevent osteoporosis and bone loss.' This reason/goal for enrolling in the program was omitted because preventing osteoporosis is not easily measurable. The self-efficacy score was calculated using question 10 on the survey. Only three items were used to calculate the self-efficacy score: 'I was tired,' 'I was under a lot of stress,' and 'I felt I didn't have time.' Participants were given a score for how confident they were that they could continue the walking program when other things got in the way. The scores were determined by the following: 1 = 'sure I could not,' 2 = 'fairly sure I could not,' 3 = 'unsure,' 4 = 'fairly sure I could do it,' and 5 ='sure I could do it.'

Data Collection Procedures

In the summer of 2003, surveys were distributed to the businesses in large manilla envelopes. Accompanying each survey was an introductory letter (Appendix D). The letter stated the reason for the survey and instructed the participant to complete the survey and place it in the envelope provided, seal it, and return it to the company representative. Each participant received a letter, survey, and envelope which was paper clipped together. The completed surveys were placed in a sealed envelope to ensure that everyone remained anonymous. After approximately two weeks, the completed surveys in the sealed envelopes were collected in manila envelopes and picked up by the researcher.

Data Analysis

The researcher consecutively numbered the surveys so the data could be entered for statistical analysis. Data were analyzed using SPSS version 11.5 for Windows. Frequencies, correlations, Chi-squared, ANOVA, T-Tests, and regression analyses were utilized. Cronbach's alpha was calculated to determine internal consistency of the goal achievement and self-efficacy scores. The goal achievement score was calculated by adding the responses of the progress made except for line 8 (prevent osteoporosis and bone loss). Goal achievement score had a Cronbach's alpha (α) of 0.74. Self-efficacy was calculated by adding the first three items: (1) I was tired, (2) I was under a lot of stress, and (3) I felt I didn't have time. Self-efficacy had a Cronbach's alpha(α) of 0.87.

Limitations

One limitation of the research is the timing of the survey. The walking program was started in April of 2002 and the surveys were not distributed until the summer of 2003. A second

limitation was there were no pre-test responses. A third limitation of the research was there was not a control group for comparison of the results.

Summary

There appears to be limited data in regard to the effectiveness of walking programs even though there are walking programs organized across the nation. The current study attempts to determine the participants' reasons for enrolling in the programs, identify the goals they set and how they progressed towards their goals and to determine the motivators and barriers to participation.

CHAPTER IV: RESULTS

Results

This study attempted to determine the impact of the Red Cedar Medical Center Community Walking Program by identifying the reason(s) or goal(s) for enrolling in the program, the progress the participants made towards their goals, the motivators and barriers they had, if they were still using their pedometer, and if they would recommend the walking program to a friend. A survey was used to collect demographic information, reasons for enrolling in the program, determine motivators and barriers to participation, fruit and vegetable consumption, helpfulness of the information folder, length of participation in the program, and if they would recommend the program to a friend.

A total of 233 surveys were collected from the individuals who participated in the Red Cedar Medical Center Community Walking Program through their place of employment. Three surveys were not complete, so were eliminated from the study leaving 230 surveys to be analyzed. Of the 230 surveys completed, 184 (80%) were female, 45 (19.6%) were male, and 1 (0.4%) did not report gender. The approximate percentages of respondents are shown in Figure 1.

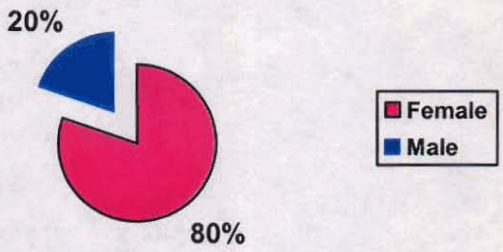

Figure 1. Percentage of Subjects Who Participated in the Red Cedar Medical Center Community Walking Program by Gender (n = 229)

The participants varied in age, 2 (.9%) were 17 or younger, 46 (20%) were 18-34, 113 (49.1%) were 35-50, 67 (29.1%) were 51-65, 1 (.4%) was 66 or older, and 1 (.4%) did not report age. For the purpose of data analysis, the categories were recoded from five categories to three categories. The 17 or younger and 18-34 categories were combined into the 34 or younger category, and the 66 or older was combined with the 51-65 category to form the 51 or older category. The recoded distribution of participants based on age is shown in Figure 2.

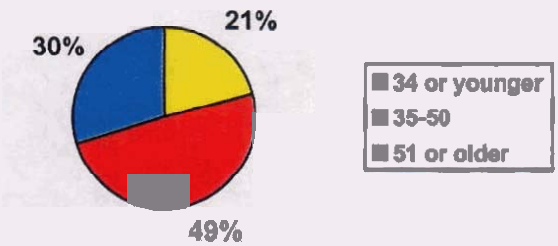

Figure 2. Percentage of Subjects Who Participated in the Red Cedar Medical Center Community Walking Program by Recoded Age Category (n = 229)

Of the 230 surveys, 229 reported their marital status, 24 (10.4%) were single, 179 (77.8%) were married, 19 (8.3%) were divorced, 1 (0.4%) was separated, 5 (2.2%) were widowed, 1 (0.4%) would rather not say, and 1 (0.4%) did not respond. For the purpose of data analysis the categories were recoded. The single category now includes the 'divorced', 'separated', and 'widowed' categories. The married category still contains only the 'married' responses. The recoded distribution of participants based on marital status is shown in Figure 3.

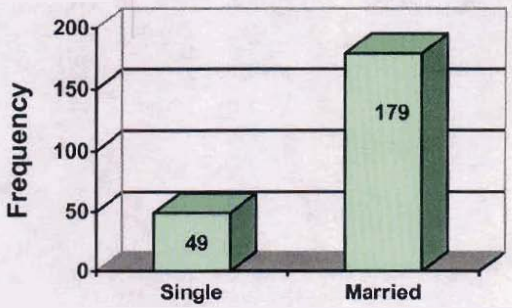

Figure 3. Number of Subjects Who Participated in the Red Cedar Medical Center Community Walking Program by Recoded Marital Status Category (n = 228)

Of the 230 surveys, 227 of the respondents reported their highest education level attained, 2 (0.9%) had less than high school education, 48 (20.9%) had a high school diploma or GED, 72 (31.3%) had gone to technical or trade school, 60 (26.1%) had a university or college degree, 45 (19.6%) had a master's or doctoral degree, and 3 (1.3%) did not respond to the question. For the purpose of data analysis the categories were recoded. The 'less than high school' and 'high school or GED' categories were combined to form 'high school/GED or less', all other categories remained unchanged. The recoded distribution of participants based on highest education level attained is shown in Figure 4.

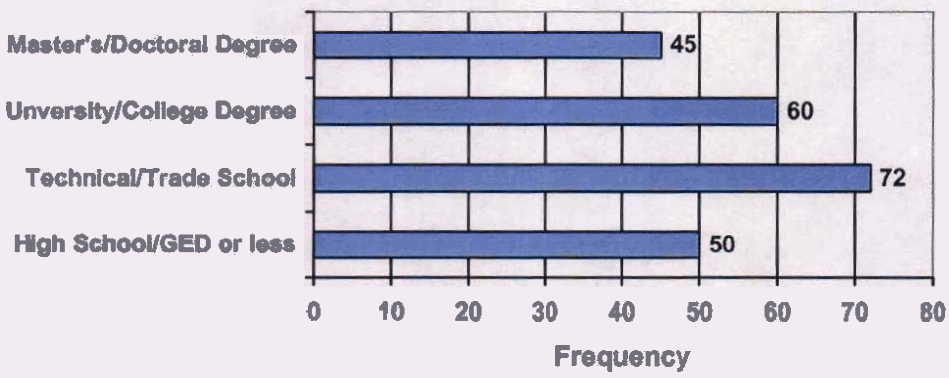

Figure 4. Number of Subjects Who Participated in the Red Cedar Medical Center Community Walking Program by Recoded Highest Education Level Attained (n = 227)

Of the 230 surveys, 226 reported their race/ethnic origin, 222 (96.5%) were Caucasian, 3 (1.3%) were Native American, 1 (0.4%) was Asian American, and 4 (1.7%) did not respond to the question. For the purpose of data analysis, the categories were recoded into two categories: Caucasian, and non-Caucasian, which included the Native American and Asian American categories.

Of the 230 surveys, 228 reported the number of children that live at home; 95 (41.3%) have 0 children at home, 106 (46.1%) have 1-2 children living at home, 27 (11.7%) have 3-5 children living at home, and 2 (0.9%) did not respond to the question. The distribution of participants based on number of children living at home is shown in Figure 5.

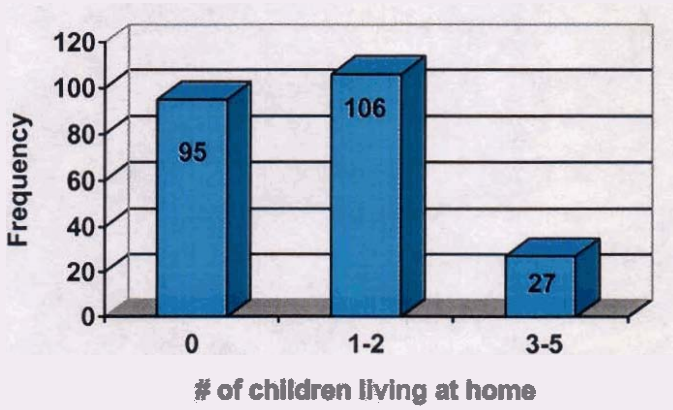

Figure 5. Number of Subjects Who Participated in the Red Cedar Medical Center Community Walking Program by Number of Children Living at Home (n = 228)

The walking program participants were asked to identify all the ways they heard about the program. The most frequent manner in which people heard about the program was at 'work,' followed by 'friend,' 'newspaper,' 'co-worker,' and 'family.' Results are presented in Figure 6.

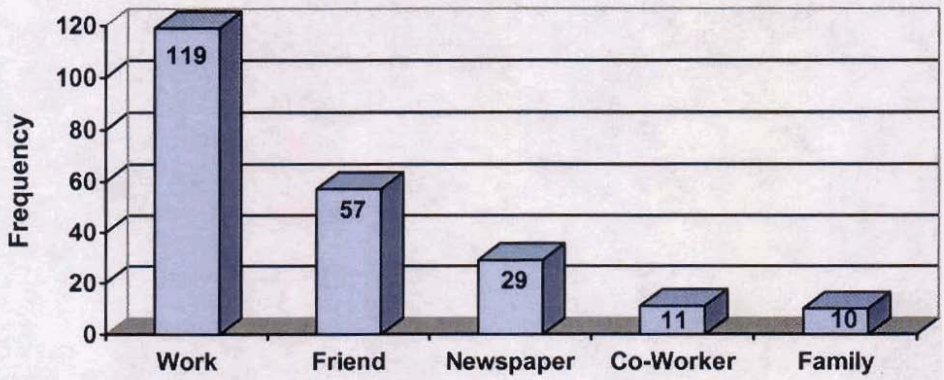

Figure 6. Frequency of Ways Participants Heard about the Red Cedar Medical Center Community Walking Program

The participants were asked to select all of the reasons/goals they had for enrolling in the walking program. The reason/goal that was selected the most frequently was to 'lose weight,' followed by 'to feel better,' 'increase energy level,' 'decrease/reduce stress,' and the fifth was 'maintain healthful weight'. All of the reasons/goals that were selected and their frequencies are presented in Figure 7.

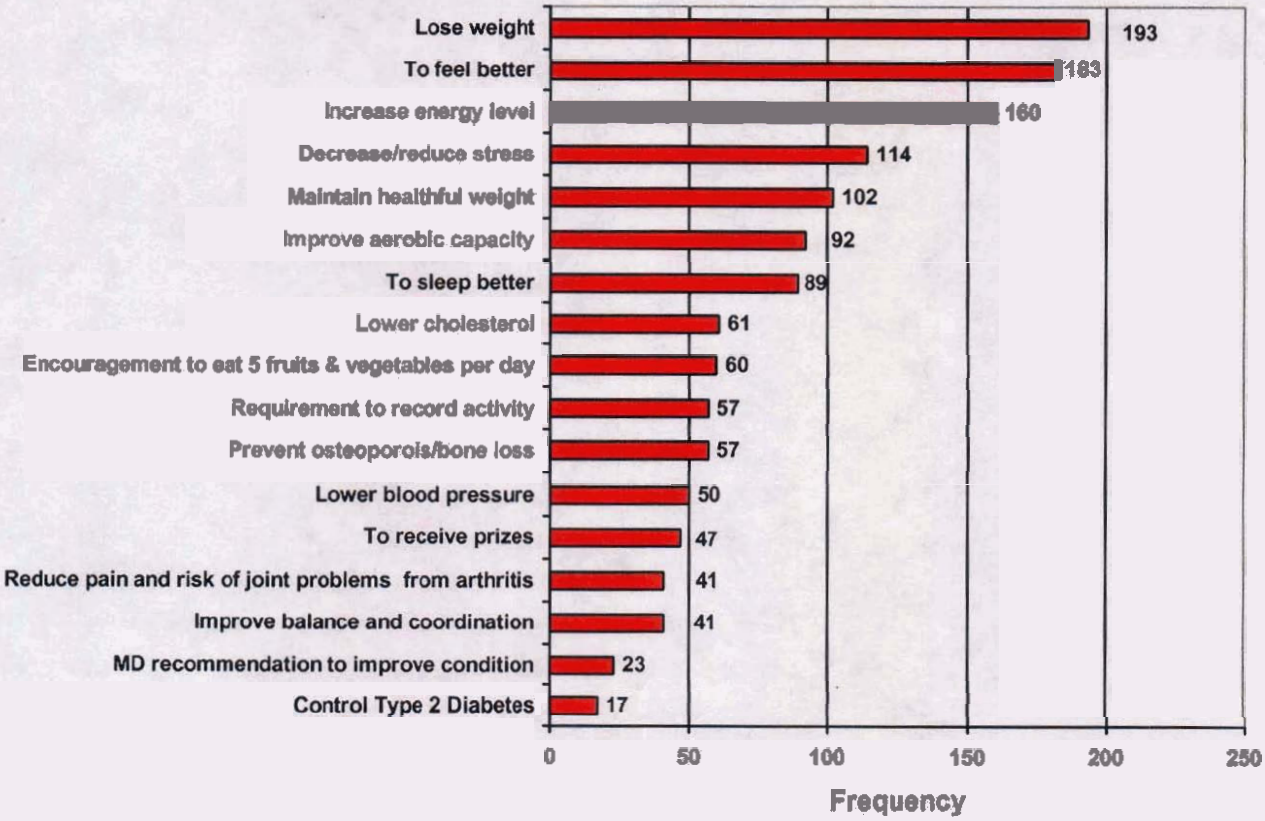

Figure 7. Frequency of Reasons/Goals for Enrolling in the Red Cedar Medical Center Community Walking Program (n = 230)

The number of goals chosen by each participant of the walking program was unlimited, the number of goals chosen ranged from 0 to 17, with five goals being the most frequent; see results in Figure 8.

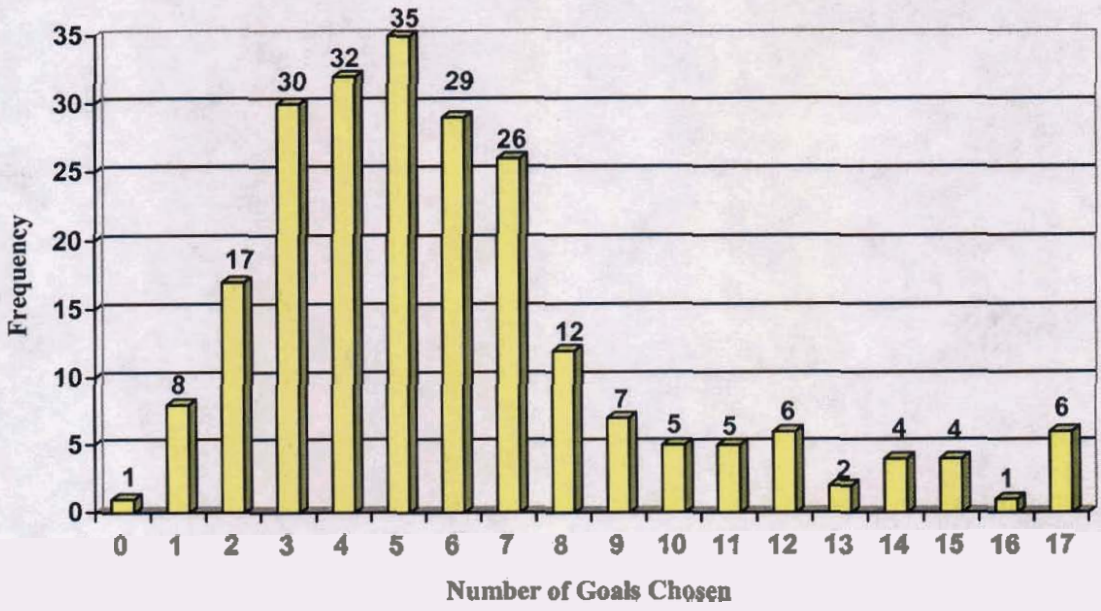

Figure 8. Frequency of the Number of Reasons/Goals for Enrolling in the Red Cedar Medical Center Community Walking Program (n = 230)

Of the top five goals that were chosen, 'feel better' was the best accomplished score with a mean score of 2.70, followed by 'maintain a healthful weight' with a mean score of 2.52, 'decrease/reduce stress' with a mean score of 2.49, increase energy level with a mean score of 2.48, and lose weight with a mean score of 2.02. Mean scores were calculated using the following scale: 0=did not achieve, 1=made some progress, 2=made good progress, 3=accomplished goal. See frequencies of the top five goals in Figure 9.

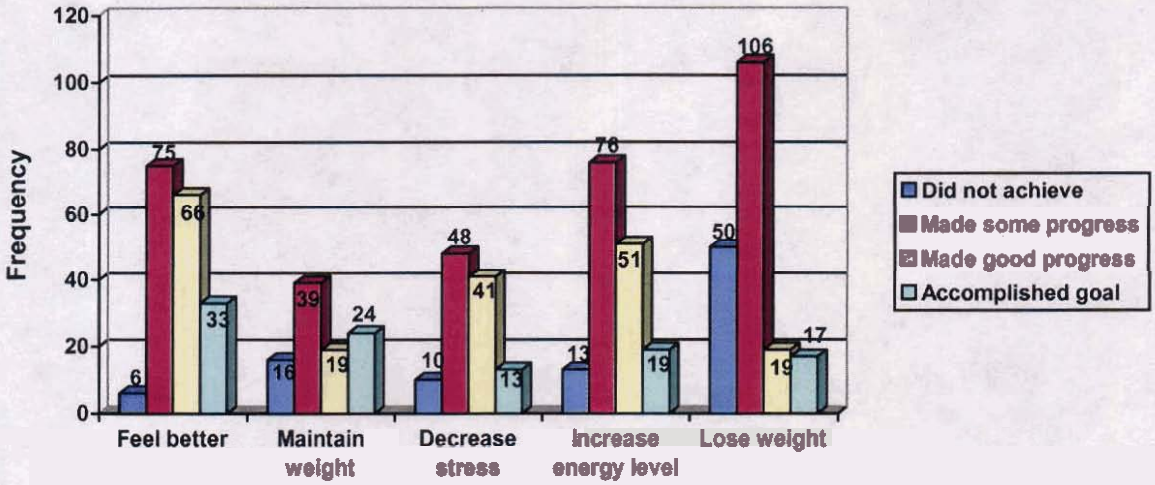

Figure 9. Progress Towards the Top Five Goals Chosen in the Red Cedar Medical Center Walking Program

The participants of the walking program were asked to rate the following items on how each influenced their participation in the program. The items included: pedometer, prizes, friends, family, calling in the mile markers, recording the daily activity records, improved health, and increased energy. The items were rated using a 5-point Likert scale. The means were calculated using the following values: 1 = Not at all, 2 = Somewhat, 3 = Moderately, 4 = Very much so, and 5 = Completely. The top three motivators were 'improved health,' 'increased energy,' and 'pedometer,' with mean scores of 3.58, 3.51, and 3.43 respectively. The least influential items were 'prizes' and 'calling in the mile markers,' with mean scores of 1.99 and 1.85 respectively. The results are presented in Figure 10.

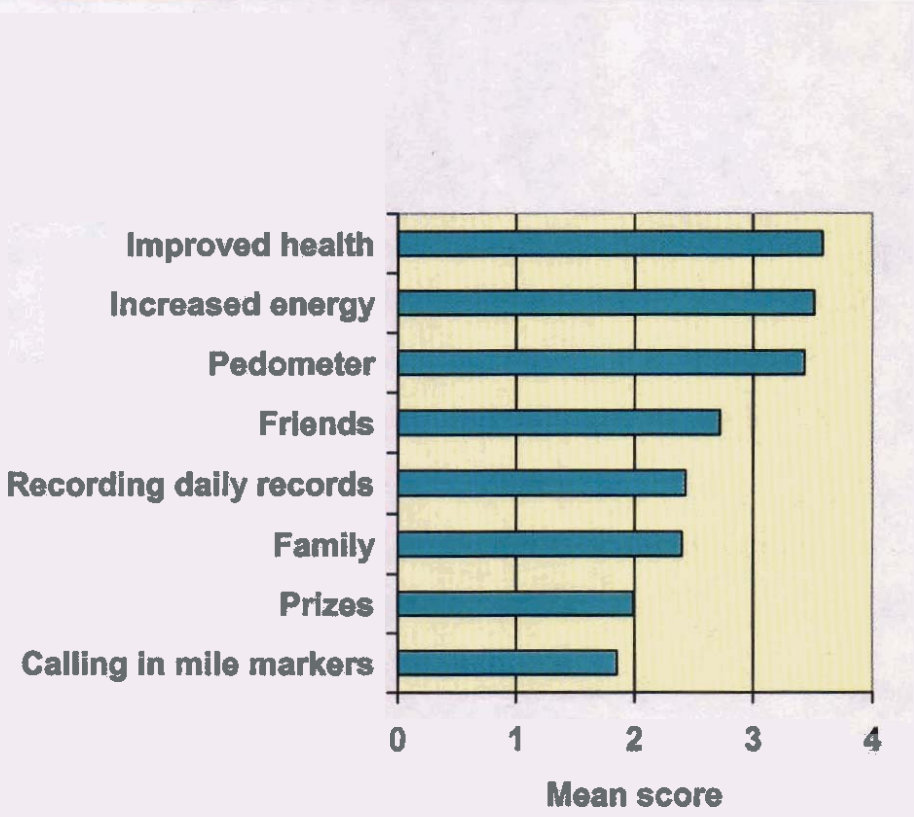

Figure 10. Mean Score of Motivators in the Red Cedar Medical Center Community Walking Program (n = 230)

The participants of the walking program were asked to rank barriers as to their impact on their activity level with 1 = greatest impact and with 5 = least impact. The participants ranked the following statements: I had to exercise alone (Alone), I did not have time due to family/work/study commitments (Time), my friends or family didn't want me to exercise (Friends/Family), the weather was bad (hot, humid, rainy, cold) (Weather), and I felt pain or discomfort while exercising (Pain). The participants ranked time as their number one barrier, 'I did not have time due to family/work/study commitments' had a mean score of 1.96. They ranked 'friend/family didn't want me to exercise' as the barrier with the least impact having a mean score of 4.27. The results are represented in Figure 11. In Independent Samples Test, married participants ranked 'I did not have time due to family/work/study commitments' as a greater barrier ($p = 0.024$) than single participants. The only significant difference found with barriers and reaching the mile markers was that those participants who did not reach the 600 mile

marker ranked 'I had to exercise alone' as a greater barrier ($p = 0.028$) than those who did reach the 600 mile marker.

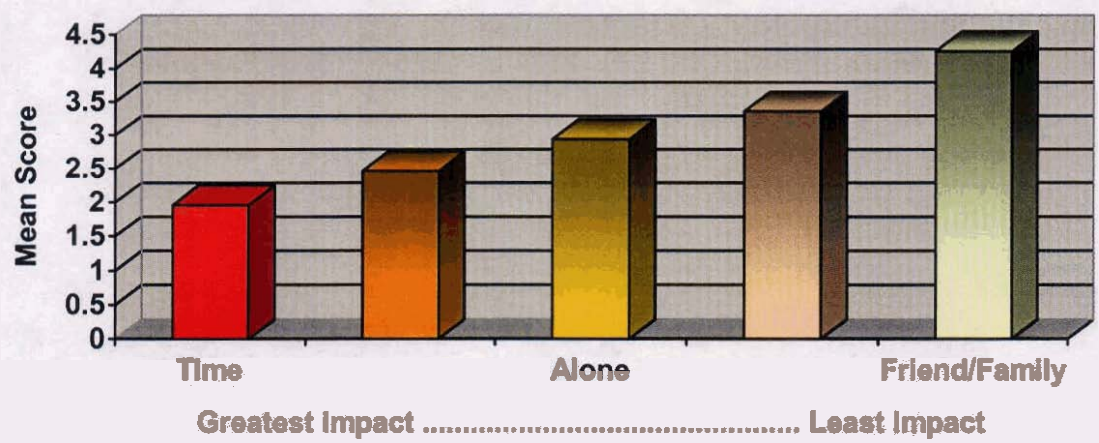

Figure 11. Mean Score of Barriers that Impacted Activity Level in the Red Cedar Medical Center Community Walking Program (n = 156)

The walking program participants were asked if they ate five fruits and vegetables per day before participating in the walking program, while participating in the walking program, and after completing the walking program. The results are represented in Figure 12.

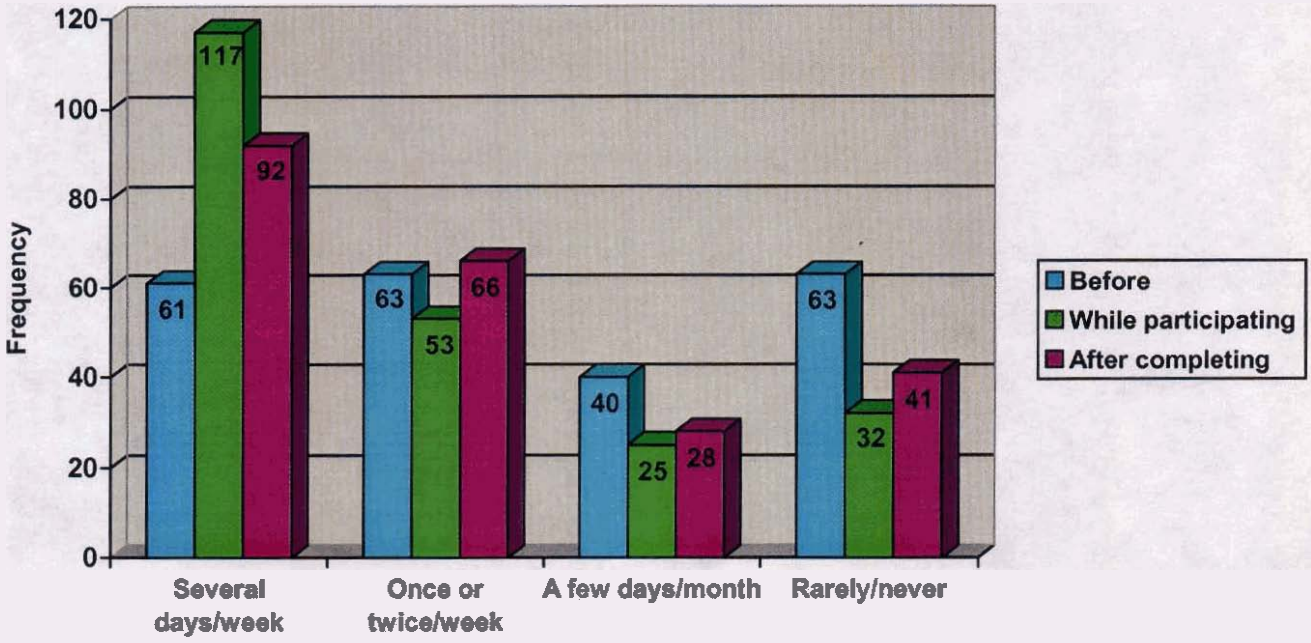

Figure 12. Number of Subjects Who Participated in the Red Cedar Medical Center Community Walking Program by Frequency of Fruit and Vegetable Consumption Before, While Participating and After Completing the Program (n = 227)

An ANOVA was used to analyze the data to determine if there was a significant difference in fruit and vegetable consumption before, during, and after completion of the walking program. There was a significant difference with the highest fruit and vegetable consumption occurring while participating in the program. Fruit and vegetable consumption after completion of program was also significantly higher than before beginning. Results are shown in Table 1.

Table 1

Mean Score for Fruit and Vegetable Intake Before, During, and After Completion of the Red Cedar Medical Center Community Walking Program

	Before beginning	While participating	After completion	
Question	Mean[1]	Mean[1]	Mean[1]	P=
Did you eat five fruits and vegetables per day	$2.46_a \pm 1.17$	$1.88_b \pm 1.09$ (indicates high consumption)	$2.08_c \pm 1.12$	0.000

Note. [1]means were determined by the following values (1=yes, several days per week, 2=yes, once or twice per week, 3=yes, a few days per month, 4=rarely, never). Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey honestly significant difference comparison

A Chi-Square analysis revealed that there was no gender difference in fruit and vegetable consumption before, while participating, or after participation in the walking program.

In order to see if self-efficacy influenced fruit and vegetable consumption, a One-way ANOVA was used to analyze the data. A One-way ANOVA revealed that participants who ate five fruits and vegetables every day several days of the week before participating in the program had a higher self-efficacy score than those who rarely/never ate five fruits and vegetables. The participants who consumed five fruits and vegetables several days of the week while participating had a higher self-efficacy score than those who consumed five fruits and vegetables once or twice per week. And, the participants who ate five fruits and vegetables several days of the week after participating in the program had a higher self-efficacy score than those who ate five fruits and vegetables each day once or twice per week or only a few days per month. See results in Table 2.

Table 2

Self-efficacy Mean Score and Fruit and Vegetable Consumption of the Participants of the Red Cedar Medical Center Community Walking Program Before Participating, While Participating and After Participating

	Mean Self-efficacy Score			
Fruit and vegetable consumption	Yes, several days/week	Yes, once or twice/week	Yes, a few days/month	Rarely/never
Before participating	$11.6_{a} \pm 2.53$	$10.6_{a,b} \pm 2.66$	$10.4_{a,b} \pm 2.77$	$10.1_{b} \pm 2.58$
While participating	$11.3_{a} \pm 2.67$	$9.8_{b} \pm 2.49$	$10.4_{a,b} \pm 2.43$	$10.3_{a,b} \pm 2.74$
After participating	$11.6_{a} \pm 2.49$	$10.1_{b} \pm 2.42$	$9.2_{b} \pm 2.85$	$10.8_{a,b} \pm 2.70$

Note. Self -efficacy scores were computed from a 5-point Likert scale (1 = sure I could not, 2 = fairly sure I could not, 3 = unsure, 4 = fairly sure I could do it, 5 = sure I could do it). Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey honestly significant difference comparison.

The walking program participants were asked if the information provided to them was helpful. Most of the participants found the information to be somewhat helpful. Results are presented in Figure 13.

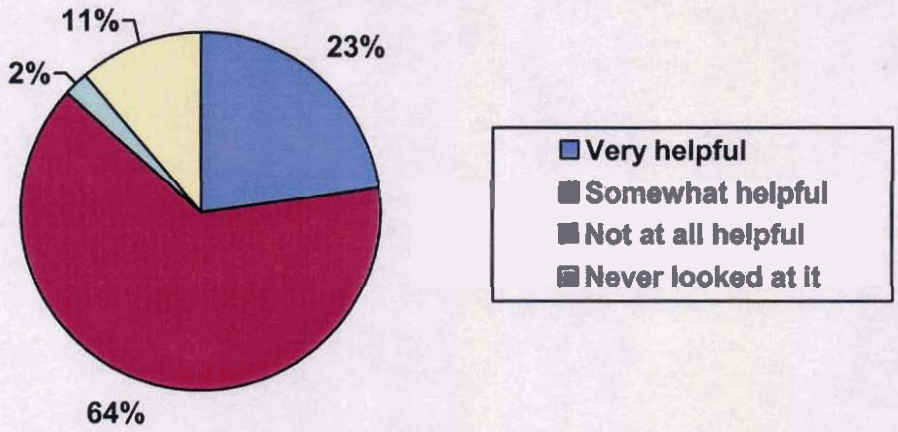

Figure 13. Percentage of Subjects Who Participated in the Red Cedar Medical Center Community Walking Program by Helpfulness of the Information (n = 227)

The walking program participants were asked if the staff was friendly when they called in the mile markers and picked up their prizes. Of the 230 surveys that were returned, 52 (22.6%) said the staff was very helpful, 145 (63.0%) said they were somewhat helpful, 5 (2.2%) reported that they were not at all helpful, 22 (9.6%) said they mailed or e-mailed their mile markers in, 104 (45.2%) reported that the question did not apply to them or they did not collect any prizes, and 6 (2.6%) did not respond to the question. Results are presented in Figure 14.

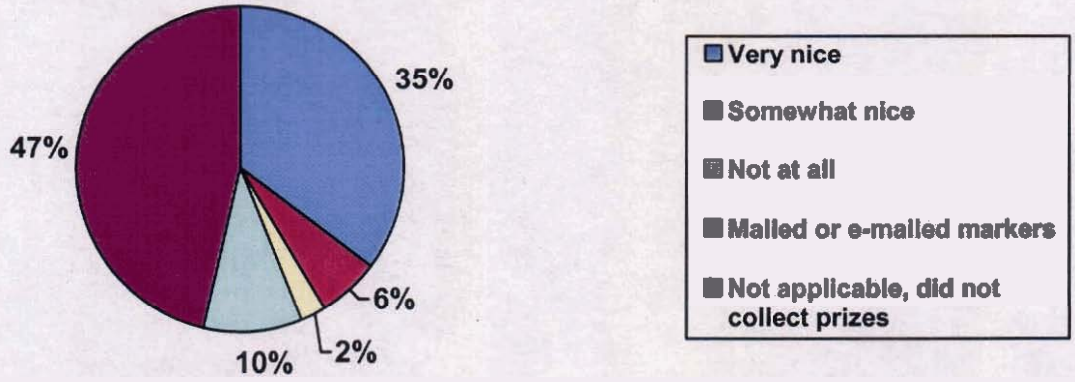

Figure 14. Percentage of Subjects Who Participated in the Red Cedar Medical Center Community Walking Program by Friendliness of Staff When Calling in the Mile Markers (n = 224)

The walking participants were asked if they reached the following mile markers: 100, 300, and 600 miles. The results are presented in Figure 15. Chi-Square analysis revealed there was no gender difference in reaching the 100 or 300 makers. However, Chi-Square analysis revealed that there was gender difference ($p = 0.021$) in reaching the 600-mile marker (Table 3). Females were less likely to reach the 600-mile marker than males. And, Chi-Square analysis revealed that there was education level difference ($p = 0.029$) in reaching the 100-mile marker (Table 4), but not the 300 or 600-mile markers. Participants who had a master's/doctoral degree were less likely to reach the 100 mile marker. In addition, Chi-Square analyses revealed that fruit and vegetable consumption was related to reaching the 100 and 300-mile markers (Table 5), but not to the 600-mile marker. Participants who reached the 100 and 300 mile markers were more likely to eat five fruits and vegetables each day several days per week, while those who did not reach the mile markers were more prone to rarely or never eat five fruits and vegetables per day.

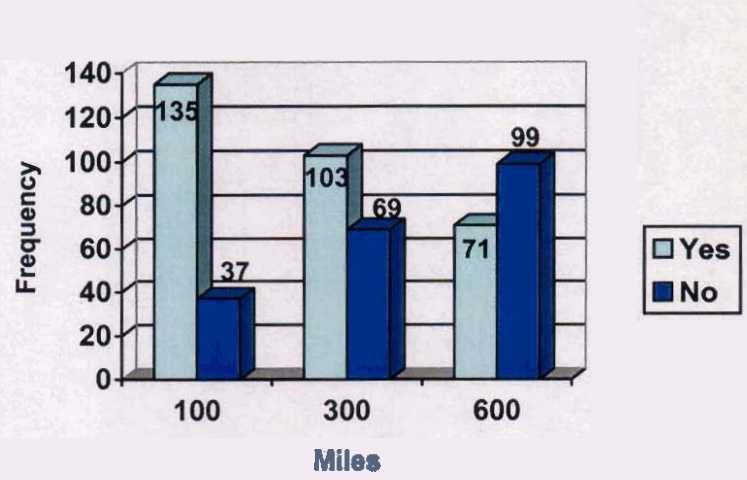

Figure 15. Number of Participants Who Participated in the Red Cedar Medical Center Community Walking Program by Completion of 100, 300, and 600 Mile Markers

Table 3

Number and Percentage of Participants Reaching 600-mile Marker of the Red Cedar Medical Center Community Walking Program by Gender

	No	Yes	X^2	Sig
Female	85 (79.1%)	50 (37.0%)	5.31	.021
Male	14 (41.2%)	20 (58.8%)		
Total	99	70		

Table 4

Number and Percentage of Participants Reaching 100-mile Marker of the Red Cedar Medical Center Community Walking Program by Highest Education Level Attained

	No	Yes	X^2	Sig
High School or less/GED	8 (19.5%)	33 (80.5%)		
Technical/Trade school	10 (18.5%)	44 (81.5%)	9.01	.029
University/College degree	6 (13.3%)	39 (86.7%)		
Master's/Doctoral degree	12 (41.4%)	17 (22.8%)		
Total	36	133		

Table 5

Number and Percentage of Participants Eating Five Fruits and Vegetables per Day in the Red Cedar Medical Center Community Walking Program by Reaching 100 and 300 Mile Markers

	Yes, several days per week	Yes, once or twice per week	Yes, a few days per month	Rarely/never	X^2	Sig
No-100 mile marker	13 (35.1%)	8 (21.6%)	6 (16.2%)	10 (27.0%)		
Yes-100 mile marker	74 (55.2%)	32 (23.9%)	13 (9.7%)	15 (11.2%)	8.44	.038
No-300 mile marker	26 (38.2%)	15 (22.1%)	12 (17.6%)	15 (22.1%)		
Yes-300 mile marker	61 (59.2%)	25 (24.3%)	7 (6.8%)	25 (14.6%)	12.25	.007
Total	87	40	19	25		

The participants of the walking program were asked if they would recommend the program to a friend. Of the 222 people who responded to the question, 135 (61%) answered yes, strongly recommend, 76 (34%) yes, with some reservation, and 11 (5%) said no, not at all. The results are presented in Figure 16. For the purpose of data analysis, the categories were combined and recoded into two categories. The yes, strongly recommend and yes with some reservation were combined into one category and the no, not at all was not changed.

The goal achievement score was calculated by adding the responses of the progress made except for line 8 (prevent osteoporosis and bone loss). Goal achievement score had a Cronbach's alpha (α) of 0.74. Self-efficacy was calculated by adding the first three items: (1) I was tired, (2) I was under a lot of stress, and (3) I felt I didn't have time. Self-efficacy had a Cronbach's alpha(α) of 0.87. The participants who recommended the program to a friend had higher goal achievement and self-efficacy scores, participated longer in the walking program, and chose more goals than those who did not recommend the program. However, the number of goals chosen was not statistically different. For results, see Table 6.

Table 6

Means of Number of Goals Chosen, Goal Achievement Score, Self-efficacy Score, and Months Participated in the Red Cedar Medical Center Community Walking Program by Recommendation of the Walking Program to a Friend

	N		Mean[1]		Std Deviation		Std Error		t value	Two-tailed probability
Recommend program to a friend	yes	no	yes	no	yes	no	yes	no		
Number of goals chosen	211	11	6.1	5.8	3.6	4.4	.25	1.33	.248	NS
Goal achievement score	211	11	8.3	3.1	6.1	3.0	.42	.92	5.146	.000
Self-efficacy score	198	9	10.8	8.4	2.6	2.4	.19	.78	2.676	.008
Months participated	165	10	5.0	3.1	2.9	2.5	.23	.78	2.049	.042

Note: [1]means were determined by the following values

goal achievement score:
1=made some progress
2=made good progress
3=accomplished goal

self-efficacy score:
1=sure I could not
2=fairly sure I could not
3=unsure
4=fairly sure I could do it
5= sure I could do it

Responses were analyzed by Independent Samples Test

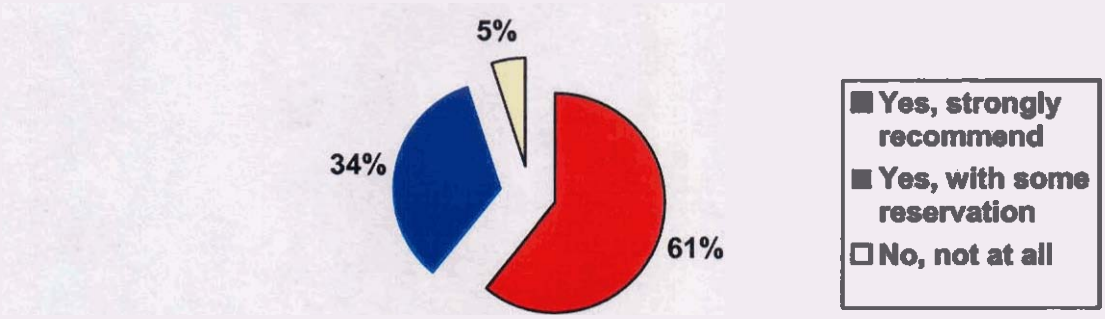

Figure 16. Percentage of Subjects Who Participated in the Red Cedar Medical Center Community Walking Program by Recommendation of Walking Program to a Friend (n = 222)

The participants were asked if they were still using their pedometer ten months after completing the walking program. Of the 222 people who responded to the question, 173 (77.9%) responded that they no longer use their pedometer. Of the 173, 70 (31.5%) said they no longer use their pedometer because it broke and 103 (46.4%) said they no longer use their pedometer. The results are presented in Figure 17. A Chi-Square analysis revealed that there was no

significance with gender, age, marital status, education, children at home, or reaching the mile markers with recommending the walking program. In an Independent Samples T-test, those participants who were still using their pedometer had a higher self-efficacy score and participated longer in the walking program than those who were no longer using their pedometer, and they also had a higher goal achievement score, but the goal achievement score was not found to be significantly different. See Table 7 for results.

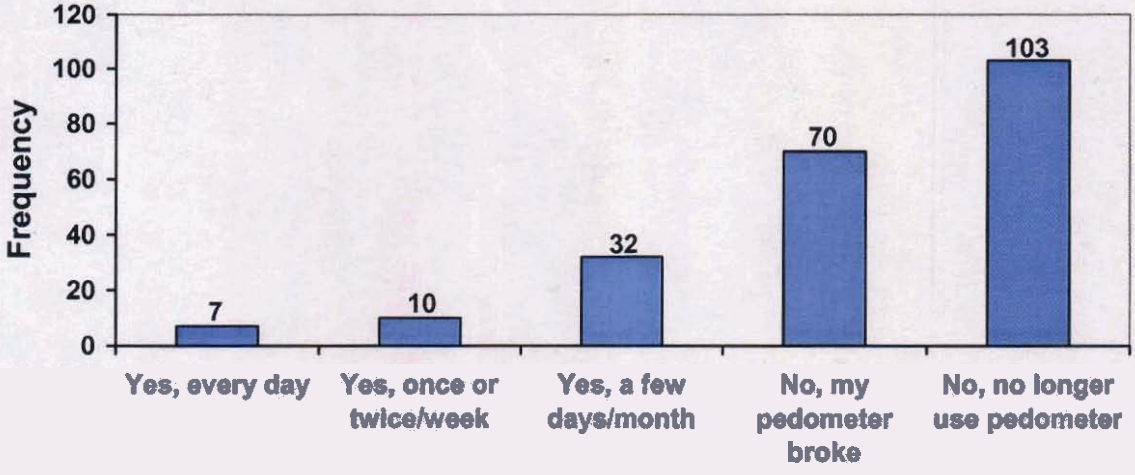

Figure 17. Number of Subjects Who Participated in the Red Cedar Medical Center Community Walking Program by Frequency of Using Pedometer After Walking Program (n = 222)

Table 7

Means of Goal Achievement Score, Self-efficacy Score, and Months Participated in the Red Cedar Medical Center Community Walking Program by Still Using Pedometer

	N		Mean[1]		Std Deviation		Std Error		t value	Two-tailed probability
Still using pedometer	yes	no	yes	no	yes	no	yes	no		
Goal achievement score	49	173	9.3	7.6	5.4	6.1	.78	.47	1.751	NS
Self-efficacy score	42	165	11.7	10.6	2.1	2.7	.32	.21	3.088	.003
Months participated	39	137	6.3	4.6	3.6	2.6	.57	.22	3.227	.001

Note: [1]means were determined by the following values

goal achievement score:
1=made some progress
2=made good progress
3=accomplished goal

self-efficacy score:
1=sure I could not
2=fairly sure I could not
3=unsure
4=fairly sure I could do it
5= sure I could do it

Responses were analyzed by Independent Samples Test

The walking program participants were asked how long they participated in the program. Of the 230 surveys that were returned, 50 did not answer the question. The results are presented in Figure 18.

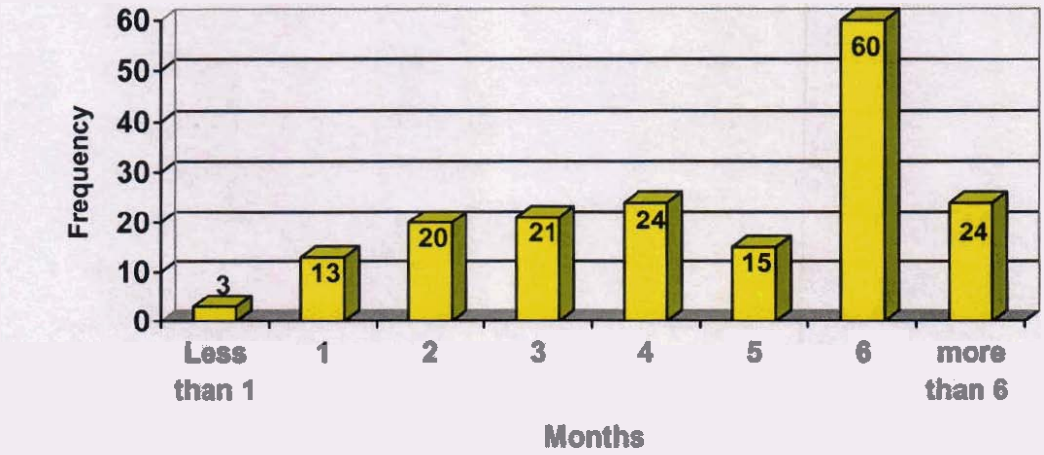

Figure 18. Number of Participants Who Participated in the Red Cedar Medical Center Community Walking Program by Number of Months Participated in Walking Program (n = 180)

Using independent samples t-tests, data analysis showed males participated longer (p=.007) than females in the walking program, 6.2 months and 4.7 months, respectively. Females tended to choose more goals than males 6.2 and 5.1, respectively, but number of goals chosen was not statistically different. Females had a higher goal achievement score than males with a mean of 8.2 and 7.3, respectively, but the mean goal achievement score was not significantly different. Males had a higher self-efficacy score than females with a mean of 11.0 and 10.7, respectively, but self-efficacy score was not statistically different.

Males had a higher (p=.000) weight than females before the walking program with a mean of 216 pounds and 164 pounds, respectively. Males had a higher (p=.000) weight than females after the walking program with a mean of 207 pounds and 155 pounds, respectively. The mean BMI before the walking program was 28 (SD = 6.06), which falls within the

overweight range (25-29.9) according to National Institutes of Health (NIH) guidelines (2003). Males had a higher (p=.018) Body Mass Index (BMI) than females before the walking program with means of 30 and 27, respectively. The BMI after the walking program was 26.6 (SD = 5.33), which falls within the overweight range (25-29.9) according to NIH guidelines (2003). Males had a higher (p=.004) BMI than females after the walking program with means of 29 and 26, respectively.

The mean systolic blood pressure for the group before the walking program was 122.1 mmHg (SD = 20.18). The group mean diastolic blood pressure before the walking program was 74.5 mmHg (SD = 12.09). Males had a higher (p=.036) systolic blood pressure than females before the walking program with means of 130 and 119, respectively. Males had a higher (p=.000) diastolic blood pressure than females before the walking program with means of 82 and 72, respectively. The mean systolic blood pressure and diastolic blood pressure of the group after the walking program was 117.3 mmHg (SD = 14.95) and 71.6 mmHg (SD =9.43), respectively. Males had a higher (p=.029) systolic blood pressure than females after the walking program with means of 123 and 115, respectively. Males had a higher diastolic (p=.000) blood pressure than females after the walking program with means of 78 and 69, respectively.

Females had a higher, but not significantly different, total cholesterol than males before the walking program means of 204 and 201, respectively. Females had a higher, but not significantly different, total cholesterol than males after the walking with program means of 194 and 189, respectively. Results of the data analysis are presented in Table 8.

Table 8

Means of Weight, BMI, Blood Pressure, and Cholesterol Before and After Completion of the Red Cedar Medical Center Community Walking Program by Gender

	N		Mean		Std Deviation		Std Error		t value	Two-tailed probability
	Female	Male	Female	Male	Female	Male	Female	Male		
Weight before program	141	41	164	216	36.43	45.97	3.1	7.2	7.574	.000
Weight, current	137	41	155	207	30.84	40.89	2.64	6.39	8.669	.000
BMI before program	141	41	27	30	6.14	5.42	.52	.85	2.395	.018
BMI, current	137	41	26	29	5.33	4.82	.46	.75	2.920	.004
Systolic blood pressure before program	60	21	119	130	18.93	21.96	2.44	4.79	2.137	.036
Diastolic blood pressure before program	60	21	72	82	11.71	9.75	1.51	2.13	3.671	.000
Systolic blood pressure, current	63	23	115	123	13.77	16.77	1.73	3.50	2.226	.029
Diastolic blood pressure, current	63	23	69	78	9.04	6.89	1.14	1.44	4.482	.000
Cholesterol before program	42	18	204	201	36.01	35.63	5.56	8.40	-.315	(NS)
Cholesterol, current	25	19	194	188	30.67	38.69	6.13	8.88	-.540	(NS)

Of the 230 surveys that were returned, 113 (49.1%) reported they lost weight, 43 (18.7%) reported they had no weight change, 19 (8.3%) reported they gained weight, and 55 (23.9%) of the participants had missing data and a weight change could not be determined. Males had a greater mean weight loss than women; 9.2 pounds $\pm$ 15.5 and 7.6 pounds $\pm$ 12.9 respectively. Males had a greater decrease in both systolic and diastolic blood pressure compared to females. Females, on the other hand, had a greater decrease in cholesterol than males, 20.5 $\pm$ 26.6 and 8.8 $\pm$ 21.1 respectively. However, independent samples t-tests revealed the participants change in weight, BMI, blood pressure, and cholesterol were not statistically different between gender. See Table 9 for results.

Table 9

Changes of Weight, BMI, Blood Pressure, and Cholesterol by Gender of the Red Cedar Medical Center Community Walking Program

	N		Mean		Std Deviation		Std Error		t value	Two-tailed probability
	Female	Male	Female	Male	Female	Male	Female	Male		
Weight change	134	41	-7.60	-9.2	12.94	15.48	1.12	2.42	.670	NS
BMI change	134	41	-1.3	-1.3	2.15	2.07	.19	.32	-.003	NS
Systolic blood pressure change	57	20	-4.7	-6.2	11.95	14.07	1.58	3.15	.456	NS
Diastolic blood pressure change	57	20	-3.2	-4.1	6.25	9.62	.83	2.15	.436	NS
Cholesterol change	23	18	-20.5	-8.8	26.57	21.10	5.54	4.97	-1.534	NS

When the subjects rated what influenced their participation, females rated 'friends' and 'increased energy' significantly higher than males; see Table 10 for results. Single participants rated 'friends' and 'recording the daily activity records' significantly higher than married participants; see Table 11 for results. The participants in the walking program who recommended the program to a friend rated all of the motivators higher than those who did not recommend the program, all were statistically different except for 'prizes' and 'friends.' See Table 12. The participants in the walking program who were still using their pedometer rated 'pedometer' and 'family' higher as motivators than those who were no longer using their pedometer.

See Table 13.

Table 10

Rating of Motivational Factors in the Red Cedar Medical Center Community Walking Program by Gender

	N		Mean[1]		SE		Std. Deviation		t value	Two-tailed probability
Motivator	Female	Male	Female	Male	Female	Male	Female	Male		
Pedometer	183	45	3.43	3.42	.052	.173	1.09	1.16	.052	NS
Prizes	178	41	1.93	2.17	-1.296	.191	1.05	1.22	-1.296	NS
Friends	180	42	2.79	2.38	2.032	.174	1.18	1.13	2.032	.043
Family	175	41	2.36	2.61	-1.177	.184	1.23	1.18	-1.177	NS
Calling in the mile markers	174	41	1.84	1.90	-.297	.181	1.11	1.16	-.297	NS
Recording the daily activities	177	42	2.51	2.10	1.906	.180	1.31	1.17	1.906	NS
Improved health	181	44	3.59	3.52	.415	.147	.98	.98	.415	NS
Increased energy	182	43	3.57	3.23	1.967	.159	1.01	1.04	1.967	.050

Note: [1]means were determined by the following values
1=not at all
2=somewhat
3=moderately
4=very much so
5=completely
Responses were analyzed by Independent Samples Test

Table 11

Rating of Motivational Factors in the Red Cedar Medical Center Community Walking Program by Marital Status

	N		Mean[1]		Std. Deviation		SE		t value	Two-tailed probability
Motivator	Married	Single	Married	Single	Married	Single	Married	Single		
Pedometer	178	49	3.4	3.7	1.1	1.1	.08	.16	1.628	NS
Prizes	169	49	1.9	2.1	1.1	1.1	.08	.16	.913	NS
Friends	172	49	2.6	3.0	1.2	1.2	.09	.17	2.097	.037
Family	167	48	2.4	2.3	1.2	1.3	.09	.19	-.456	NS
Calling in the mile markers	167	47	1.8	2.0	1.1	1.1	.09	.16	1.122	NS
Recording the daily activities	169	49	2.3	2.8	1.3	1.3	.10	.20	1.980	.049
Improved health	175	49	3.6	3.6	1.0	.94	.08	.13	.841	NS
Increased energy	175	49	3.5	3.6	1.0	1.0	.08	.14	.606	NS

Note: [1]means were determined by the following values
1=not at all
2=somewhat
3=moderately
4=very much so
5=completely
Responses were analyzed by Independent Samples Test

Table 12

Rating of Motivational Factors in the Red Cedar Medical Center Community Walking Program by Recommendation of Program

	N		Mean[1]		Std. Deviation		SE		t value	Two-tailed probability
Recommend program to friend	Yes	No	Yes	No	Yes	No	Yes	No		
Pedometer	211	11	3.5	2.8	1.07	1.33	.07	.40	1.979	.049
Prizes	203	10	2.0	1.8	1.08	1.48	.08	.47	.548	NS
Friends	206	11	2.8	2.5	1.19	1.13	.08	.34	.816	NS
Family	199	11	2.5	1.3	1.23	.47	.09	.14	7.249	.000
Calling in the mile markers	199	10	1.9	1.2	1.14	.42	.08	.13	4.553	.000
Recording the daily activities	203	10	2.5	1.6	1.29	.84	.09	.27	3.258	.007
Improved health	208	11	3.6	2.6	.94	1.03	.07	.31	3.385	.001
Increased energy	208	11	3.6	2.4	.97	1.12	.07	.34	3.961	.000

Note: [1]means were determined by the following values
1=not at all
2=somewhat
3=moderately
4=very much so
5=completely
Responses were analyzed by Independent Samples Test

Table 13

Rating of Motivational Factors in the Red Cedar Medical Center Community Walking Program by Still Using Pedometer

	N		Mean[1]		Std. Deviation		SE		t value	Two-tailed probability
Still using pedometer	Yes	No	Yes	No	Yes	No	Yes	No		
Pedometer	49	173	3.8	3.3	1.10	1.08	.16	.08	2.685	.008
Prizes	46	167	1.9	2.0	1.08	1.08	.16	.08	-.537	NS
Friends	49	167	2.9	2.7	1.26	1.16	.18	.09	1.061	NS
Family	47	163	2.9	2.3	1.24	1.19	.18	.09	2.868	.005
Calling in the mile markers	47	162	1.9	1.9	1.08	1.14	.16	.09	-.104	NS
Recording the daily activities	48	165	2.5	2.4	1.29	1.29	.19	.10	.428	NS
Improved health	49	170	3.8	3.5	.86	1.01	.12	.08	1.898	NS
Increased energy	49	170	3.7	3.5	.95	1.04	.14	.08	1.638	NS

Note: [1]means were determined by the following values
1=not at all
2=somewhat
3=moderately
4=very much so
5=completely
Responses were analyzed by Independent Samples Test

The participants who reached the mile markers of 100, 300, and 600 miles had a higher goal achievement score, a higher self-efficacy score, and participated longer in the program than those who did not reach the mile markers. The number of goals chosen was not statistically

different between those who completed the mile markers and those who did not. The goal achievement score was calculated using question 9 on the survey. Participants were given a score according to how they progressed on the goals they chose. The following scale was used to calculate goal achievement score: 1 = 'made some progress,' 2 = 'made good progress,' and 3 = 'accomplished goal.' All items on question 9 were used except for 'prevent osteoporosis and bone loss.' This reason/goal for enrolling in the program was omitted because preventing osteoporosis is not easily measurable. The self-efficacy score was calculated using question 10 on the survey. Only three items were used to calculate the self-efficacy score: 'I was tired,' 'I was under a lot of stress,' and 'I felt I didn't have time.' Participants were given a score for how confident they were that they could continue the walking program when other things got in the way. The scores were determined by the following: 1 = 'sure I could not,' 2 = 'fairly sure I could not,' 3 = 'unsure,' 4 = 'fairly sure I could do it,' and 5 ='sure I could do it.' See Tables 14-16 for results.

Table 14

Means of Number of Goals Chosen, Goal Achievement Score, Self-efficacy Score, and Months Participated in the Red Cedar Medical Center Community Walking Program by Completion of 100 Mile Marker

	N		Mean[1]		Std Deviation		Std Error		t value	Two-tailed probability
Completed 100 mile marker	yes	no	yes	no	yes	no	yes	no		
Number of goals chosen	135	37	6.3	5.5	3.63	3.9	.31	.64	-1.239	NS
Goal achievement score	135	37	9.2	5.1	6.1	4.5	.52	.74	-4.588	.000
Self-efficacy score	127	34	11.6	8.8	2.2	2.6	.20	.45	-6.080	.000
Months participated	110	30	6.1	3.1	2.8	2.0	.27	.37	-5.274	.000

Note: [1]means were determined by the following values
goal achievement score:
1=made some progress
2=made good progress
3=accomplished goal

self-efficacy score:
1=sure I could not
2=fairly sure I could not
3=unsure
4=fairly sure I could do it
5= sure I could do it

Responses were analyzed by Independent Samples Test

Table 15

Means of Number of Goals Chosen, Goal Achievement Score, Self-efficacy Score, and Months Participated in the Red Cedar Medical Center Community Walking Program by Completion of 300 Mile Marker

	N		Mean[1]		Std Deviation		Std Error		t value	Two-tailed probability
Completed 300 mile marker	yes	no	yes	no	yes	no	yes	no		
Number of goals chosen	103	69	6.2	6.0	3.5	3.9	.35	.48	-.397	NS
Goal achievement score	103	69	9.8	6.1	6.3	4.9	.62	.58	-4.089	.000
Self-efficacy score	96	65	11.9	9.7	2.2	2.6	.22	.32	-5.891	.000
Months participated	80	60	6.6	3.8	2.8	2.4	.31	.31	-6.302	.000

Note: [1]means were determined by the following values

goal achievement score:
1=made some progress
2=made good progress
3=accomplished goal

self-efficacy score:
1=sure I could not
2=fairly sure I could not
3=unsure
4=fairly sure I could do it
5= sure I could do it

Responses were analyzed by Independent Samples Test

Table 16

Means of Number of Goals Chosen, Goal Achievement Score, Self-efficacy Score, and Months Participated in the Red Cedar Medical Center Community Walking Program by completion of 600 Mile Marker

	N		Mean[1]		Std Deviation		Std Error		t value	Two-tailed probability
Completed 600 mile marker	yes	no	yes	no	yes	no	yes	no		
Number of goals chosen	71	99	6.4	6.0	3.8	3.7	.45	.37	-.784	NS
Goal achievement score	71	99	10.5	6.8	6.4	5.3	.75	.53	-4.134	.000
Self-efficacy score	66	93	12.3	10.0	2.1	2.5	.25	.26	-5.920	.000
Months participated	51	87	7.0	4.5	2.8	2.7	.39	.29	-5.201	.000

Note: [1]means were determined by the following values

goal achievement score:
1=made some progress
2=made good progress
3=accomplished goal

self-efficacy score:
1=sure I could not
2=fairly sure I could not
3=unsure
4=fairly sure I could do it
5= sure I could do it

Responses were analyzed by Independent Samples Test

The participants of the walking program who completed the 100, 300, and 600 mile markers rated all of the motivational factors significantly higher than those who did not complete the mile markers. There were two exceptions, 'friends' and 'family' were not statistically

different between those who completed the 600 mile maker and those who did not. See Tables 17-19 for results.

Table 17

Rating of Motivational Factors in the Red Cedar Medical Center Community Walking Program by Completion of 100 Mile Marker

	N		Mean[1]		Std. Deviation		SE		t value	Two-tailed probability
Completed 100 mile marker	yes	no	yes	no	yes	no	yes	no		
Pedometer	135	37	3.6	2.8	.97	1.35	.08	.22	-3.513	.001
Prizes	132	36	2.2	1.6	1.15	.84	.10	.14	-3.648	.000
Friends	130	37	2.9	2.3	1.16	1.02	.10	.17	-3.074	.002
Family	127	37	2.6	1.9	1.24	1.00	.11	.17	-3.856	.000
Calling in the mile markers	130	34	2.1	1.4	1.22	.65	.11	.11	-4.594	.000
Recording the daily activities	131	36	2.8	1.9	1.28	1.10	.11	.18	-3.849	.000
Improved health	132	37	3.8	3.0	.85	1.20	.07	.20	-3.930	.000
Increased energy	132	37	3.7	3.0	.89	1.25	.08	.21	-3.602	.001

Note: [1]means were determined by the following values
1=not at all
2=somewhat
3=moderately
4=very much so
5=completely
Responses were analyzed by Independent Samples Test

Table 18

Rating of Motivational Factors in the Red Cedar Medical Center Community Walking Program by Completion of 300 Mile Marker

	N		Mean[1]		Std. Deviation		SE		t value	Two-tailed probability
Completed 300 mile marker	yes	no	yes	no	yes	no	yes	no		
Pedometer	103	69	3.7	3.1	.99	1.21	.10	.15	-3.185	.002
Prizes	100	68	2.3	1.7	1.19	.89	.12	.11	-4.046	.000
Friends	99	68	2.9	2.5	1.18	1.09	.12	.13	-2.283	.024
Family	98	66	2.6	2.2	1.26	1.14	.13	.14	-2.387	.018
Calling in the mile markers	98	66	2.2	1.5	1.26	.83	.13	.10	-4.251	.000
Recording the daily activities	99	68	3.0	1.9	1.25	1.08	.13	.13	-5.968	.000
Improved health	100	69	3.9	3.2	.83	1.08	.08	.13	-4.356	.000
Increased energy	100	69	3.8	3.2	.90	1.11	.09	.13	-3.784	.000

Note: [1]means were determined by the following values
1=not at all
2=somewhat
3=moderately
4=very much so
5=completely
Responses were analyzed by Independent Samples Test

Table 19

Rating of Motivational Factors in the Red Cedar Medical Center Community Walking Program by Completion of 600 Mile Marker

	N		Mean[1]		Std. Deviation		SE		t value	Two-tailed probability
Completed 600 mile marker	yes	no	yes	no	yes	no	yes	no		
Pedometer	71	99	3.8	3.2	1.0	1.13	.12	.11	-3.584	.000
Prizes	68	98	2.5	1.8	1.23	.94	.15	.10	-4.039	.000
Friends	68	97	2.9	2.7	1.24	1.09	.15	.11	-1.048	NS
Family	66	96	2.5	2.4	1.28	1.20	.16	.12	-.293	NS
Calling in the mile markers	66	96	2.3	1.7	1.35	.93	.17	.09	-3.410	.001
Recording the daily activities	67	98	3.2	2.1	1.20	1.16	.15	.12	-6.002	.000
Improved health	68	99	3.9	3.4	.83	1.05	.10	.11	-3.646	.000
Increased energy	68	99	3.8	3.4	.92	1.08	.11	.11	-2.659	.009

Note: [1]means were determined by the following values
1=not at all
2=somewhat
3=moderately
4=very much so
5=completely
Responses were analyzed by Independent Samples Test

A One-way ANOVA revealed that participants who had a high school or less than high school education or GED rated prizes as a greater motivator than the other groups (technical/trade school, university/college degree, and master's/doctoral degree). The participants with a high school or less than high school education or GED rated calling in the mile markers as a greater motivator than the university/college degree and master's/doctoral degree groups. The participants with a technical or trade school degree rated calling in the mile markers as a greater motivator than those with a master's/doctoral degree. The master's/doctoral degree group rated calling in the mile markers as a very low motivator. And, those who had a high school or less than high school education or GED rated recording the daily activities as a greater motivator than those with a master's/doctoral degree. See results in Table 20. The walking program participants with a university or college degree ranked time as a greater barrier (indicated by a smaller number) than the high school or less than high school education or GED group. And the high

school, less than high school or GED group rated pain as a greater barrier (indicated by a smaller number) than the technical/trade school, university/college degree groups, see Table 21 for results. The walking program participants who were 51 and older ranked pain as a greater barrier (indicated by a smaller number) than the other groups (34 and younger and 35-50), see Table 22 for results.

Table 20

Highest Education Level Attained and Motivators of the Red Cedar Medical Center Community Walking Program

Motivator	High school/GED or less	Technical/trade school	University/college degree	Master's/doctoral degree
Prizes	$2.4_{a} \pm 1.11$	$1.9_{b} \pm 1.11$	$1.9_{b} \pm .98$	$1.7_{b} \pm 1.06$
Calling in the mile markers	$2.3_{a} \pm 1.24$	$2.0_{a,b} \pm 1.19$	$1.7_{b,c} \pm .99$	$1.3_{c} \pm .69$
Recording the daily activity records	$2.8_{a} \pm 1.31$	$2.6_{a,b} \pm 1.19$	$2.3_{a,b} \pm 1.37$	$2.0_{b} \pm 1.18$

Note: [1]means were determined by the following values (1=not at all, 2=somewhat, 3=moderately, 4=very much so, 5= completely)
Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey honestly significant difference comparison.

Table 21

Highest Education Level Attained and Barriers of the Red Cedar Medical Center Community Walking Program

Barrier	High school/GED or less	Technical/trade school	University/college degree	Master's/doctoral degree
I did not have time	$2.4_{a} \pm 1.26$	$2.0_{a,b} \pm 1.13$	$1.6_{b} \pm .93$	$1.8_{a,b} \pm 1.02$
I felt pain while exercising	$2.7_{a} \pm 1.34$	$3.6_{b} \pm 1.25$	$3.6_{b} \pm 1.07$	$3.3_{a,b} \pm .1.32$

Note: [1]means were determined by the following values: 1 = greatest impact; 5 = least impact
Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey honestly significant difference comparison.

Table 22

Age and Barriers of the Red Cedar Medical Center Community Walking Program

Barrier	34 and younger	35-50	51 and older
I felt pain while exercising	$3.6_{a} \pm 1.32$	$3.6_{a} \pm 1.16$	$2.7_{b} \pm 1.22$

Note: [1]means were determined by the following values: 1 = greatest impact; 5 = least impact
Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey honestly significant difference comparison.

A one-way ANOVA revealed that the walking program participants who consumed at least five fruits and vegetables a day once or twice per week while participating in the walking program rated calling in the mile markers as a higher motivator than those who rarely or never consumed five fruits and vegetables each day. Those walking program participants who consumed five fruits and vegetables each day several days of the week while participating in the walking program rated improved health and increased energy as higher motivators than those who rarely or never consumed five fruits and vegetables per day. See Table 23 for results.

Table 23

Fruit and Vegetable Consumption While Participating in the Walking Program and Motivators of the Red Cedar Medical Center Community Walking Program

Frequency of fruit and vegetable consumption	Yes, several days per week	Yes, once or twice per week	Yes, a few days per month	Rarely/never
Calling in the mile markers	$1.9_{a,b} \pm 1.13$	$2.1_{a} \pm 1.23$	$1.6_{a,b} \pm .92$	$1.5_{b} \pm .90$
Improved health	$3.8_{a} \pm .94$	$3.5_{a,b} \pm .85$	$3.24_{a,b} \pm .88$	$3.19_{b} \pm 1.20$
Increased energy	$3.7_{a} \pm .99$	$3.5_{a,b} \pm .95$	$3.4_{a,b} \pm .91$	$3.0_{b} \pm 1.14$

Note: [1]means were determined by the following values (1=not at all, 2=somewhat, 3=moderately, 4=very much so, 5= completely)
Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey honestly significant difference comparison.

A One-way ANOVA revealed that those who consumed five fruits and vegetables each day several days per week after completing the walking program rated improved health and increased energy as higher motivators than those who rarely or never ate five fruits and vegetables each day (Table 24). Also, those who consumed five fruits and vegetables each day several days per week after completing the walking program chose more goals and had a higher goal achievement score than the participants who rarely or never consumed five fruits and vegetables per day (Table 25).

Table 24

Fruit and Vegetable Consumption after Completing the Walking Program and Motivators of the Red Cedar Medical Center Community Walking Program

Frequency of fruit and vegetable consumption	Yes, several days per week	Yes, once or twice per week	Yes, a few days per month	Rarely/never
Improved health	$3.8_a \pm .97$	$3.6_{a,b} \pm .88$	$3.3_{a,b} \pm .86$	$3.2_b \pm 1.12$
Increased energy	$3.7_a \pm 1.00$	$3.5_{a,b} \pm .98$	$3.4_{a,b} \pm .92$	$3.0_b \pm 1.05$

Note: [1]means were determined by the following values (1=not at all, 2=somewhat, 3=moderately, 4=very much so, 5= completely)
Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey honestly significant difference comparison.

Table 25

Fruit and Vegetable Consumption after Participating in the Walking Program and Number of Goals Chosen and Goal Achievement Score of the Red Cedar Medical Center Community Walking Program

Frequency of fruit and vegetable consumption	Yes, several days per week	Yes, once or twice per week	Yes, a few days per month	Rarely/never
Number of goals chosen	$6.4_a \pm 3.64$	$6.1_{a,b} \pm 3.48$	$6.8_{a,b} \pm 4.24$	$4.6_b \pm 3.19$
Goal achievement score	$9.1_a \pm 6.62$	$8.2_{a,b} \pm 5.60$	$7.4_{a,b} \pm 5.84$	$5.7_b \pm 4.70$

Note: [1]means were determined by the following values (1=not at all, 2=somewhat, 3=moderately, 4=very much so, 5=completely)
Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey honestly significant difference comparison.

A One-way ANOVA revealed that those who found the information very helpful had a higher goal achievement score than those who found the information somewhat helpful, not at all helpful, or those who did not look at the information (Table 26). The participants who said the staff was not nice at all when they called in their mile markers and picked up the prizes had a lower self-efficacy than those who thought the staff was not at all friendly or did not collect any prizes. Interestingly, the group who mailed or e-mailed in the mile markers had a similarly high self-efficacy score as those who rated the staff as very friendly. The participants who said the staff was very nice when they called in the mile markers and picked up their prizes had a higher goal achievement score than those who did not collect prizes (Table 27).

Table 26

Helpfulness of Information and Goal Achievement Score of the Red Cedar Medical Center Community Walking Program

	Yes, very helpful	Yes, somewhat helpful	No, not at all helpful	I never looked at it
Goal achievement score	$10.4_a \pm 6.45$	$7.9_b \pm 5.74$	$2.6_b \pm 2.41$	$4.8_b \pm 4.84$

Note: [1]means were determined by the following values (self-efficacy score: 1=sure I could not, 2=fairly sure I could not, 3=unsure, 4=fairly sure I could do it, 5=sure I could do it). Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey honestly significant difference comparison.

Table 27

Friendliness of Staff and Self-efficacy Score and Goal Achievement Score of the Red Cedar Medical Center Community Walking Program

	Yes, very nice	Yes, somewhat nice	No, not at all	I mailed or e-mailed my mile markers	Not applicable, did not collect prizes
Self-efficacy score	$11.4_a \pm 2.37$	$10.4_{a,b} \pm 2.18$	$7.6_b \pm 2.61$	$11.5_{a,c} \pm 2.19$	$10.2_{b,c} \pm 2.89$
Goal achievement score	$9.5_a \pm 6.89$	$6.79_{a,b} \pm 3.47$	$8.0_{a,b} \pm 5.79$	$8.7_{a,b} \pm 5.50$	$6.81_b \pm 5.46$

Note: [1]means were determined by the following values

goal achievement score:
1=made some progress
2=made good progress
3=accomplished goal

self-efficacy score:
1=sure I could not
2=fairly sure I could not
3=unsure
4=fairly sure I could do it
5= sure I could do it

Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey honestly significant difference comparison.

Significant correlations were found between weight and systolic and diastolic blood pressure before and after the walking program. Significant correlations were also found between BMI and blood pressure before and after completing the walking program, indicating heavier participants tended to have higher blood pressures (See Table 28). BMI before and after completing the walking program was inversely related to self-efficacy ($r = -.232$, $p = .002$) and ($r = -.293$, $p = .000$), respectively. Participants with higher BMIs had lower self-efficacy that those with lower BMIs. Significant positive correlations were also found between months participated and self-efficacy and goal achievement score. Also, number of goals chosen and goal achievement score were significantly correlated, but number of goals chosen was not significantly correlated with self-efficacy. See Table 29 for results.

Table 28

Correlations between Weight, BMI, and Blood Pressure Before and After Completion of the Red Cedar Medical Center Community Walking Program

		Systolic blood pressure before	Diastolic blood pressure before	Current systolic blood pressure	Current diastolic blood pressure
Weight before program	Pearson Correlation	.500	.603	.400	.450
	Sig. (2-tailed)	.000	.000	.000	.000
	N	74	74	79	79
Current weight	Pearson correlation	.437	.523	.380	.426
	Sig. (2-tailed)	.000	.000	.000	.000
	N	76	76	81	81
BMI before program	Pearson Correlation	.460	.528	.347	.358
	Sig. (2-tailed)	.000	.000	.002	.001
	N	74	74	79	79
Current BMI	Pearson correlation	.396	.441	.321	.318
	Sig. (2-tailed)	.000	.000	.003	.004
	N	76	76	81	81

Table 29

Correlations between Months Participated and Self-efficacy and Number of Goals Chosen and Goal Achievement Score of the Red Cedar Medical Center Community Walking Program

		Self-efficacy score	Goal achievement score
Months participated	Pearson Correlation	.384	.267
	Sig. (2-tailed)	.000	.000
	N	170	180
Number of goals chosen	Pearson Correlation	-.032	.642
	Sig. (2-tailed)	.638	.000
	N	214	230

Several factors were entered into a stepwise linear regression analysis in an attempt to predict self-efficacy. The regression results showed that improved health, months participated in the walking program, and goal achievement score were significant predictors of self-efficacy, see Table 30. In addition, we wanted to see if self-efficacy predicted if the participants were still using their pedometer after completing the walking program (Table 31), and to see if self-efficacy predicted the number of months participated in the walking program (Table 32). The regression results showed that self-efficacy was a significant predictor of months participated in the walking program. In a separate analysis, many predictors were entered into a stepwise linear regression in an attempt to predict months participated in the walking program. Self-efficacy was

the only predictor that remained; predictors that were excluded included education level, family, friendliness of the staff, and weight change.

Table 30

Coefficients for Self-efficacy Regression of the Participants in the Red Cedar Medical Center Community Walking Program

Variable	Unstand. Beta	SE	Stand Beta	t	Sig.	R	R^2
Improved health	.794	.184	.289	4.324	.000	.578	.334
Goal achievement score	.125	.028	.293	4.401	.000	.578	.334
Months participated	.198	.058	.229	3.408	.001	.578	.334

Dependent variable: Self-efficacy score

Table 31

Coefficients for Using Pedometer After Completion of the Red Cedar Medical Center Community Walking Program

Variable	Unstand. Beta	SE	Stand Beta	t	Sig.	R	R^2
Self-efficacy	-.102	.026	-.264	-3.919	.000	.264	.070

Dependent variable: Still using pedometer after completing the walking program

Table 32

Coefficients for Months Participated in the Red Cedar Medical Center Community Walking Program

Variable	Unstand. Beta	SE	Stand Beta	t	Sig.	R	R^2
Self-efficacy	.445	.083	.384	5.390	.000	.384	.147

Dependent variable: Months participated in walking program

A number of factors were entered into a stepwise linear regression analysis in an attempt to predict fruit and vegetable consumption before, while participating, and after completing the walking program. The regression results showed that there were no predictors for fruit and vegetable consumption before participating in the walking program. However, the number of children at home was a significant predictor in both fruit and vegetable consumption while participating (Table 33) and after completing the walking program (Table 34).

Table 33

Coefficients for Fruit and Vegetable Consumption While Participating in the Red Cedar Medical Center Community Walking Program

Variable	Unstand. Beta	SE	Stand Beta	t	Sig.	R	R^2
Children at home	.478	.206	.395	2.318	.028	.395	.156

Dependent variable: Fruit and vegetable consumption while participating in the walking program

Table 34

Coefficients for Fruit and Vegetable Consumption after Completing the Red Cedar Medical Center Community Walking Program

Variable	Unstand. Beta	SE	Stand Beta	t	Sig.	R	R^2
Children at home	.667	.284	.447	2.345	.028	.447	.200

Dependent variable: Fruit and vegetable consumption after completing the walking program

In an attempt to predict if success in the walking program played a role in health indicators (changes in BMI, blood pressure, cholesterol, and weight), a linear regression analysis was run. The only significant predictor found was goal achievement score, which contributed about 6% of the variability in weight change and also about 6% of the variability in change in

BMI. Cholesterol change contributed about 25% of the variability. Goal achievement score did not predict change in blood pressure. The other variables that did not predict a change in the health indicators included number of months participated in the walking program and reaching the 100, 300, or 600 mile markers.

Evidence

One hundred eighty four women and forty-five men participated in the study. The majority of the participants were married and between the ages of 35-50. A majority of the subjects had attended technical or trade school, had a college education, or a master's or doctoral degree and had 0-2 children living at home. The number one goal selected was to lose weight, while the participants made the best progress towards feeling better. The factors that predicted self-efficacy were improved health, months participated in the walking program, and goal achievement score. The top three motivators identified were: improved health, increased energy, and the pedometer. The greatest barrier identified was time. The participants' fruit and vegetable consumption improved. Only a small percentage (22%) of the participants were still using their pedometer, and 95% of the participants said they would recommend the walking program to a friend.

CHAPTER V: DISCUSSION

Summary

The study found that men participated longer than women in the Red Cedar Medical Center Community Walking Program. Men had higher self-efficacy than women; but self-efficacy was not significantly different. The number one reason for enrolling in the program was to lose weight, and 49% of the participants reported that they lost weight. The greatest barrier identified was time and the greatest motivator identified was improved health. Fruit and vegetable consumption increased. And, 95% of the participants said they would recommend the walking program to a friend.

Demographics

The present study of 230 individuals had over four times as many females as males participating in the walking program. It is not known if this is representative of the overall population because these results reflect a sampling of the participants in the walking program. Males participated longer in the walking program than females, 6.2 months and 4.7 months respectively. Males had a slightly higher, but not significant, self-efficacy score than females, similar to other studies (Marcus et al., 1992; Oman & King, 1998; Leenders et al., 2002), where no significant difference between self-efficacy and gender was found. Females chose more goals and had a higher goal achievement score than males, but the differences were not statistically different.

Males weighed more, had a higher BMI, and had higher blood pressure before and after the walking program than females. The mean BMI of the group before the walking program was 28 and after the walking program was 26.6, which was similar to another study done by Stutts (2002), where the mean BMI for the group was 27.9. Females had higher cholesterol than males

before and after the walking program, but the difference was not significant. Of the 230 surveys that were returned, approximately 49% of the participants reported they lost weight. Males had a greater weight loss than females, 9.2 pounds and 7.6 pounds respectively. Males also had a greater decrease in blood pressure than females. Females, on the other hand, had a greater decrease in cholesterol than males. However, changes in weight, BMI, blood pressure, and cholesterol were not significantly different between males and females.

Almost half (49%) of the participants were between the ages of 35 and 50. A majority of the participants were married (78.5%). Almost half (46%) of the participants had a college, university, master's, or doctoral degree. A majority (98%) of the participants were Caucasian. And, approximately 42% had no children living at home and 58% had between 1-5 children living at home.

The most frequent way the participants heard about the Red Cedar Medical Center Community Walking Program was through 'work,' which was very logical since we had to contact the participants through their place of employment. It was also noted that the participants heard about the program through a friend and some saw it in the newspaper. Thus, for this program the most effective way of advertising was at work. Very few participants reported that they heard about the program from their physician. Pate et al. (1995) found that patients respect their physicians' advice and change their exercise behaviors as a result of their advice. Therefore, it is important that community physicians are aware of programs that are available and recommend them to their patients.

Goals

The goal chosen the most frequently was to lose weight, although the goal chosen secondly, to feel better, had the best mean score toward accomplishing the goal. The third, fourth,

fifth, sixth, and seventh goals were to increase energy, decrease/reduce stress, maintain healthful weight, improve aerobic capacity, and to sleep better, respectively. Only 47 of the participants selected to receive prizes as a goal; which indicates health goals were more important and prizes were less important. Most people chose five goals. The number of goals chosen had a positive correlation with the goal achievement score; the more goals chosen, the higher the score. The participants who consumed five fruits and vegetables each day after completing the walking program chose more goals and had a higher goal achievement score than those who rarely or never ate five fruits and vegetables a day. Other studies have found that setting goals is an effective method to increase participation in a program (Alexy, 1985; Kyllo & Landers 1995; Pate et al., 1995; Cullen et al., 2004).

The participants who found the information very helpful had a higher goal achievement score than those who found it somewhat helpful, not at all helpful, or never looked at it. This suggests that the information was beneficial and helped achieve their goals. The participants who thought the staff was friendly when they called in the mile markers and picked up their prizes had a higher goal achievement score than those who did not collect any prizes.

Self-efficacy

The participants who thought the staff was not at all friendly had a lower self-efficacy score than those who thought the staff was very nice or than those who mailed or emailed their mile markers. The factors that predicted self-efficacy included improved health, months participated in the walking program, and goal achievement score. This study did not find any significant difference between self-efficacy and age or education level, which is consistent with another study (Marcus et al., 1992).

Motivators

The three biggest motivators in the walking program were improved health, increased energy, and pedometer. Improved health was the number one motivator selected; the participants who would recommend the walking program to a friend rated it as a greater motivator than those who would not recommend the walking program to a friend. The participants who consumed five fruits and vegetables per day several days of the week while participating in the walking program rated improved health as a greater motivator than those who consumed five fruits and vegetables per day either rarely or never.

Increased energy was the second highest motivator on the list; females rated it as a higher motivator than males. The participants who consumed five fruits and vegetables per day several days of the week after completing the walking program rated increased energy as a greater motivator than those who consumed five fruits and vegetables per day a few days per month and rarely or never.

The pedometer was still an important motivator even though a large percentage (78%) of the participants reported that they no longer used their pedometer; approximately 32% reported their pedometer broke and 46% reported that they no longer used it. The pedometer ranked third out of eight in the list of motivators. The only groups that ranked the pedometer as being a greater motivator were the participants who were still using their pedometer compared to those who were not and by those who would recommend the program to a friend versus those who would not.

Prizes were rated seventh out of eight on the list of motivators. Again, no differences were found within the categories of gender, marital status, recommendation of the walking program, and if people were still using their pedometer, with prizes as a motivator. The study

found that those who had their GED, high school or less than high school education rated prizes as a higher motivator than those who went to technical or trade school, had a university or college degree or master's or doctoral degree.

Although friends were rated fourth out of eight for motivators of the walking program, females rated friends as a greater motivator than males, and singles also rated friends as a higher motivator than married participants. The participants who were still using their pedometer rated family as a higher motivator versus those who were no longer using the pedometer.

Calling in the mile markers was the lowest motivator on the list. No differences were found within the categories of gender, marital status, recommendation of the walking program, and if people were still using their pedometer, with calling in the mile markers as a motivator. The participants who had a GED, high school or less than high school education rated calling in the mile marker as a higher motivator than those with a university or college degree or a master's or doctoral degree. The walking program participants who consumed five fruits and vegetables each day once or twice per week while participating in the walking program rated calling in the mile markers as a higher motivator than those who rarely or never consumed five fruits and vegetables per day.

Single participants rated recording the daily activities as a higher motivator than married participants. Participants who had a GED, high school or less than high school education rated recording the daily activity records as a higher motivator than those with a master's or doctoral degree. Speck and Looney (2000) found that keeping daily activity records increased number of steps taken daily.

The participants who reached the 100, 300, and 600 mile markers rated all of the motivators (pedometer, improved health, increased energy, friends, recording daily records,

family, prizes, and calling in mile markers) higher than those who did not complete the mile markers. There were two exceptions, for those who completed the 600-mile marker; friends and family were not significantly different than those who did not complete the 600-mile marker.

Barriers

Time was the greatest barrier that impacted the participants' activity level, which concurred with Stutts (2002) and also a study done in Minnesota (Lindberg, 2000), where participants were challenged to increase their daily physical activity by taking 10,000 steps per day. The barrier that had the least impact on the participants was that their friends or family did not want them to exercise. In our study, the participants who had a college or university degree rated time as a greater barrier than those with a GED, high school, or less than a high school education.

The participants with a GED, high school or less than high school education rated pain as a greater barrier than those with a technical or trade school degree or university or college degree. Also, the participants who were 51 or older rated pain as a greater barrier than the younger groups.

Health Indicators (Weight, BMI, Blood Pressure, and Cholesterol)

The current study found that higher body weight and BMI was correlated with higher systolic and diastolic blood pressure. A study by Stutts (2002) also found significant correlations between BMI and blood pressure, indicating that heavier participants have higher blood pressures. Stutts (2002) and Nies and Kershaw (2002), found that BMI and self-efficacy were negatively correlated, the same was also found to be true in the current study, the participants with higher BMIs tended to have lower self-efficacy than those with lower BMIs.

Goal achievement score was found to predict the participants' change in weight, BMI, and cholesterol, but not blood pressure. The other variables that did not predict changes in weight, BMI, blood pressure, and cholesterol included number of months participated in the program and reaching the mile markers (100, 300, or 600).

Fruit and Vegetable Consumption

Fruit and vegetable consumption improved for the study group while participating in the walking program; and although consumption did decrease after the program concluded, fruit and vegetable consumption was significantly better than before the program. The participants with a higher self-efficacy score were more likely to eat five fruits and vegetables each day several days of the week. ANOVA analyses indicated that gender, age, marital status, education, and number of children living at home were not related to fruit and vegetable consumption.

However, regression analysis found that the only predictor of fruit and vegetable consumption was number of children living at home and only predicted fruit and vegetable consumption while participating and after completing the walking program, not before beginning the program. The study found that the participants with more children living at home, the less frequent that five fruits and vegetables were consumed each day. Since children are known to not be fond of fruits and vegetables, it appears that the adults with children at home are not eating them either. This could suggest that the adults are using their children as an excuse for not eating fruits and vegetables or these results may reflect the cost of produce to larger families. This may also suggest that adults purchase fruits and vegetables for their children and not for themselves because they are expensive.

Value of Information/Friendliness of Staff

Overall, the information provided to the participants was helpful; 23% of the participants found it very helpful, while 64% found it to be somewhat helpful. It would be valuable to have asked what information was the greatest help and what type of information was desired by the participants to help them be more successful. The participants who found the information to be very helpful had a higher self-efficacy score than those who did not find the information to be helpful. Because the study did not evaluate self-efficacy before and after the program, this suggests that the information provided the participants with more knowledge and allowed them to increase their self-efficacy.

Even though a fairly large percentage (47%) of the participants did not collect any prizes, the participants who did collect prizes reported the staff was very nice (41%). Again, this reiterates that prizes were not an important part of the walking program.

Reached Mile Markers

Unfortunately, the number of people who completed all of the mile markers declined. While 135 and 103 of the 172 who answered the question completed the 100 miles and 300 miles respectively, only 71 of the 170 who answered the question completed 600 miles. Significantly more men than women reached the 600-mile marker, but no gender difference was found between the 100 and 300 mile markers.

The present study found that the participants who had a master's or doctoral degree were less likely to reach the 100-mile marker, but no difference was found in the 300 and 600 mile markers; although, previous research suggests that people with more education tend to be more active (US Department of Health and Human Services, 2000).

The study also found that the participants who reached the 100 and 300 mile markers, but not the 600 mile marker, were more likely to eat five fruits and vegetables each day several days of the week, while those who did not reach the mile markers were more prone to rarely or never eat five fruits and vegetables per day.

The participants who reached the 100, 300, and 600 mile markers participated longer in the program, had a higher self-efficacy scor,e and higher goal achievement score than those who did not complete the mile markers. They also chose more goals, but this was not significant.

Recommendation of Walking Program

In general, the walking program participants would recommend the program to a friend. Of the 222 people who answered the question, 95% said they would recommend the walking program to a friend, but 5% reported that they would not recommend the walking program at all. This study did not have the 100% recommendation as another study completed in Minnesota (Lindberg, 2000). Sadly we don't know why people wouldn't recommend the walking program, but it would be advantageous to follow up with the participants to allow improvements to be made to the program. The participants who would recommend the program participated longer in the program, had a higher self-efficacy score, and had a higher goal achievement score than those who would not recommend the program. The number of goals was not a significant indicator of the recommendation of the walking program. There was no difference with gender, age, marital status, education, number of children at home, or reaching the mile markers with recommending the walking program to a friend. It appears that the subjects who were successful in the program were more likely to recommend the program to a friend than those who were not.

Still Using Pedometer

Of the 222 people who responded to the question asking if they still used their pedometer, almost 80% said they no longer used their pedometer. Of those, almost 40% said they no longer used their pedometer because it broke. The study found that those who were still using their pedometer had a higher self-efficacy score and participated longer in the walking program than those who were no longer using their pedometer. The study found that self-efficacy was a predictor if the walking program participants were still using their pedometer.

Months in Walking Program

The Red Cedar Medical Center Community Walking Program was intended to run for six months. Approximately 47% of the subjects studied participated for 6 months or more, while 53% participated less than six months. It would be beneficial to know why or what prevented them from participating the six months.

There was a significant positive correlation between months in the program and self-efficacy score and goal achievement score; the longer the participation, the higher the scores.

The only predictor of the number of months a subject participated in the walking program was self-efficacy. Factors that were excluded consisted of education level, family, friendliness of the staff, and change in weight.

One point of discussion worth mentioning is the self-efficacy question. It is a controversial point; did self-efficacy determine successfulness in the program or did the successfulness of the program increase self-efficacy. Ideally self-efficacy would have been measured before beginning the program and after completion of the program. But since the study was conducted after completion of the program, this remains a debate.

In running the regression analysis, it was interesting to see that the only predictor to improving weight, BMI, and cholesterol was the subject's goal achievement score, which may indicate that it is important for walking program participants to set goals, or they may not see any changes. Note that self-efficacy did not effect weight change, BMI change, blood pressure change or cholesterol change.

Limitations

To improve the survey, a question asking if participants were still using their pedometer should have been followed up with a question such as if they were still walking or participating in some other form of exercise. People may not being using their pedometer, but may still be walking or engaged in another form of physical activity. Another limitation is that all data collected were self-reported and not actually measured by the researcher.

Conclusions

In studying the impact of the Red Cedar Medical Center Community Walking Program it was found that it was effective in increasing fruit and vegetable consumption, it helped participants lose weight, decrease blood pressure, and decrease cholesterol. As in a previous study (Croteau, 2004), we found that pedometers were effective in getting people to move. In the present study, time was identified as the greatest barrier and improved health was the number one motivator identified by the participants. And most people were satisfied with the program, as 95% of them said they would recommend it to a friend.

Implications

From our sample of the study, we found that 70 of the 222 people who responded to the survey were not using their pedometer anymore because it broke. It may be worthwhile to supply a more dependable pedometer, even if it means that it may be more expensive. Our study would

have been more valuable if we would have had a pre- and post-test that could have been used to measure self-efficacy, weight, blood pressure and cholesterol. Our data indicates that goals need to be set before beginning a program.

Recommendations

In future studies it would be advantageous to have a control group. In future research it may be helpful to ask the participants what information they think would be useful, so they could be more successful and accomplish their goals. It would also be advantageous to have focus groups to know why participants would not recommend the program to their friends.

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Appendix A: Protection of Human Subjects

STOUT
UNIVERSITY OF WISCONSIN

Stout Solutions • Research Services
11 Harvey Hall

University of Wisconsin-Stout
P.O. Box 790
Menomonie, WI 54751-0790

715/232-1126
715/232-1749 (fax)
http://www.uwstout.edu/rps/

Date: June 3, 2003

To: Kathryn Marek

CC: Carol Seaborn
Food and Nutrition

From: Sue Foxwell, Research Administrator and Human Protections Administrator, UW-Stout Institutional Review Board for the Protection of Human Subjects in Research (IRB)

Subject: **Protection of Human Subjects--Expedited Review**

Your project, "Evaluation of The Red Cedar Medical Center Community Walking Program," has been approved by the IRB through the expedited review process. The measures you have taken to protect human subjects are adequate to protect everyone involved, including subjects and researchers.

This project is approved through June 2, 2004. Research not completed by this date must be submitted again outlining changes, expansions, etc. Annual review and approval by the IRB is required.

Thank you for your cooperation with the IRB and best wishes with your project.

***NOTE: This is the only notice you will receive – no paper copy will be sent.**

SF:kn

Appendix B: Brochure

Red Cedar Medical Center Community Walking Program

Red Cedar Medical Center
Mayo Health System
2321 Stout Road, Menomonie, WI 54751
715-233-7888 www.rcmc-mhs.org

What's the Program?

Red Cedar Medical Center community walking program is a way to boost your health in a new, fun and exciting way!

"A 1997 Surgeon General's report on the physical activity habits of Americans revealed that 60 percent of adults don't get enough exercise to achieve health benefits and 25 percent of adults are not active at all." *(Getting Active - Staying Active, American Institute for Cancer Research)*

Our goal is to increase the number of steps you take daily until you reach 10,000 or more per day. Using your pedometer, you can first see how many steps you take in a day and then find creative ways to gradually increase your steps.

Park at the far corner of the shopping center and walk instead of trying to park close to the entrance. Walk up the stairs instead of using the elevator. A lifestyle change conducted over six months can produce a lasting change.

Treat Yourself!

People have many reasons why they can't exercise: they are too busy, have children, have a demanding job, aren't physically able to or just don't like exercise.

Whatever your reason, it is time to make some changes and treat yourself to good health. Walking provides many benefits you can't pass up!

After all, few things are more important than your health. Walking can benefit you in the following ways:

- Improve your aerobic capacity
- Prevent osteoporosis
- Reduce pain and risk of joint problems from arthritis
- Help you maintain a healthful weight - reduce your risk for developing various cancers
- Reduce your risk of cardiovascular disease
- Make is less likely that you will develop adult-onset diabetes
- Improve balance and coordination

Check with your doctor before starting a new exercise program.

Meet your Pedometer

The pedometer is a small device that counts every step you take. It is the basis for the walking program, as it tracks your progress and allows you to go at your own pace. All you have to do is wear your pedometer every day.

At the end of each day, record the number of steps you took on your activity log. When you have recorded your steps, push the yellow button on your pedometer to clear the steps. It's that simple!

> *"Don't lie down when you can sit. Don't sit when you can stand. Don't stand when you can move."*
> *Laurence E. Morehouse*

You can wear your pedometer on your waist band (NOT your belt), but it must fit snugly to your body for maximum accuracy. Use the strap to avoid dropping or losing your pedometer. See the instructions that came with your pedometer. Call 888-422-1806 or see www.walk4life.com with problems or questions.

Keeping Track

Along with your pedometer, you receive an activity log to help you keep track of your progress. Simply record the number of steps you take every day on the daily log.

> *"Be not afraid of going slowly, be afraid only of standing still."*
> *Chinese Proverb*

Mile Markers

You can set your own personal goals based on the mile markers below. Turn in your activity totals by phone, e-mail or mail every 100 miles, and pick up your incentive prizes at the ✪ markers below. List your name, date and miles.

10,000 steps = 5 miles
2,000 steps = 1 mile

Divide the number of steps by 2,000 to convert steps to miles.

Mile markers & Conversion Chart

	Steps	Miles	Minutes
✪	200,000	100	2,000
	400,000	200	4,000
✪	600,000	300	6,000
	900,000	450	9,000
✪	1,200,000	600	12,000
	1,600,000	800	16,000

Be a Community Walker

For only $20, an individual receives a pedometer, activity log and eligibility for incentives and prizes. For a family of 3, the charge is $35. You can join at the hospital gift shop. (Please make out membership checks to Myrtle Werth Hospital) Not only can you win prizes but you can increase your health level too!

Incentives will be given out at the volunteer desk in Myrtle Werth Hospital lobby Monday through Friday. Come in for your gift when you reach the following mile markers:

100 miles - travel coffee mug or water bottle
300 miles - Mayo Clinic books ($15 value)
600 miles - flip- top desk calculator

When you turn in your records, your name will be entered in a larger drawing. Prizes include Chamber dollars, cookbooks and gym bags.

Information sources:

"Mayo Clinic Healthy Weight for Life"
"Mayo Clinic Get Fit Stay Fit"
"Getting Active - Staying Active," American Institute for Cancer Research, www.aicr.org
Health Management Resources, Luther Midelfort - Mayo Health System
Gunderson Lutheran "Shoe Crew" program
Walk4Life and Yamax pedometer

What Else Counts?

Walking provides many great health benefits, but there are many other exercises that are good for you too.

Here are other activities that count towards your daily 10,000 steps.

- Housework
- Shoveling Snow
- Stair Climbing
- Dancing
- Gardening, mowing lawn

See the reference chart for more details.

Five a Day

Fruits and vegetables are low in calories, high in fiber and provide a variety of vitamins and minerals. In addition, "they contain phytochemicals that can reduce your risk of cardiovascular disease and some cancers." (Mayo Clinic William Sonoma Cookbook). Filling up on fruits, vegetables and fiber can keep your daily calorie intake lower.

- Eat at least five fruits and vegetables each day.
- Record the number of servings you eat in your activity log.

Logging in

Below is a review of what you need to do to participate. Good luck!

1. Wear your pedometer every day.
2. Record your steps on your daily log every night.
3. Turn in your daily logs by email, mail, phone or in person when you reach each mile markers.
4. Eat five fruits and vegetables a day.
5. Treat yourself to a new, healthier you in 2002 and for a lifetime.

See the chart below to find information in the other brochures that RCMC provided.

Brochure Reference Chart

Information	Where to find it
BMI (Body Mass Index) Chart	Healthy Weight for Life, Page 3
Converting activities to calories	Healthy Weight for Life, page 38;
What is a serving, conversion charts for steps/physical activity, helpful websites	Community walking program packet

This program is sponsored by Women's Circle of Care, Community Education Committee. Funded by Menomonie Community Health Foundation.

Appendix C: Survey

Survey

I understand that by returning this survey, I am giving informed consent as a participating volunteer in this study. I understand the basic nature of the study, the benefits from completion of the study, and agree that any potential risks are exceedingly small. I am aware that the information is being sought in a specific manner so that only minimal identifiers are necessary and confidentiality is guaranteed. I have a right to withdraw my participation at anytime.

Answer questions 1 through 7 by placing a check in front of your answer.

1. Gender (Please check one)
___ Female
___ Male

2. Age (in years) (Please check one)
___ 17 or younger
___ 18-34
___ 35-50
___ 51-65
___ 66 or older

3. Marital status (Please check one)
Single
___ Married
___ Divorced
___ Separated
___ Widowed
___ Rather not say

4. Highest education level attained (Please check one)
___ Less than high school
___ High school or GED
___ Technical school/Trade school
___ University/College degree
___ Master's/Doctoral degree

5. Race/Ethnic origin (Please check one)
___ Caucasian
___ African American
___ Native American
___ Asian American
___ Hispanic
___ Other _____
(Please specify)

6. How many children live at home?
___ 0
___ 1-2
___ 3-5
___ 6 or more

7. How did you hear about the walking program? (Check all that apply)
___ Doctor
___ Friend
___ Family
___ Newspaper
___ Radio
___ Hospital visit
___ Other _____
(Please specify)

8. When did you sign up/enroll in the program? (Give your best estimate of the month, day, and year)

_____/_____/_____
(Month) (Day) (Year)

9. In column (1) please check all the reasons/goals you signed up/enrolled in the Red Cedar Medical Center Community Walking Program. **In columns (3) through (6) indicate to what extent you achieved the goal(s) you checked.**

(1)	(2) Reasons/goal for enrolling in the program	(3) Did not achieve	(4) Made some progress	(5) Made good progress	(6) Accomplished goal
☐	Lose weight	☐	☐	☐	☐
☐	Lower blood pressure	☐	☐	☐	☐
☐	Lower cholesterol	☐	☐	☐	☐
☐	Improve balance and coordination	☐	☐	☐	☐
☐	Improve aerobic capacity	☐	☐	☐	☐
☐	Increase energy level	☐	☐	☐	☐
☐	Decrease/reduce stress	☐	☐	☐	☐
☐	Prevent osteoporosis and bone loss	☐	☐	☐	☐
☐	Reduce pain and risk of joint problems from arthritis	☐	☐	☐	☐
☐	To maintain a healthful weight (reduce risk for various cancers)	☐	☐	☐	☐
☐	Control Type 2 (adult-onset) diabetes	☐	☐	☐	☐
☐	To feel better	☐	☐	☐	☐
☐	To sleep better	☐	☐	☐	☐
☐	To receive prizes	☐	☐	☐	☐
☐	Doctor recommendation to improve condition	☐	☐	☐	☐
☐	Encouragement to eat 5 fruits and vegetables per day	☐	☐	☐	☐
☐	Requirement to record activity	☐	☐	☐	☐

The Walking Program included the following steps:

- Wearing your pedometer every day.
- Recording your steps on your daily log every night.
- Turning in your daily logs by email, mail, phone, or in person when you reach each mile marker.
- Eating five fruits and vegetables a day.
- Treating yourself to a new, healthier you in 2002 and for a lifetime.

Keeping the above steps in mind, please continue with question # 10.

10. Respond to <u>each</u> statement by placing a check in the box to indicate how confident you were in continuing the walking program (steps stated before) when other things got in the way.

I felt confident that I could follow the program when…	Sure I could NOT	Fairly sure I could NOT	Unsure	Fairly sure I COULD do it	Sure I COULD do it
I was tired	☐	☐	☐	☐	☐
I was under a lot of stress	☐	☐	☐	☐	☐
I felt I didn't have the time	☐	☐	☐	☐	☐
I was on vacation	☐	☐	☐	☐	☐
It was raining or snowing	☐	☐	☐	☐	☐

11. Place a check in the box to indicate how **<u>each</u>** of the following influenced your participation in the program.

	Not at all	Somewhat	Moderately	Very much so	Completely
Pedometer	☐	☐	☐	☐	☐
Prizes	☐	☐	☐	☐	☐
Friends	☐	☐	☐	☐	☐
Family	☐	☐	☐	☐	☐
Calling in the mile markers	☐	☐	☐	☐	☐
Recording the daily activity records	☐	☐	☐	☐	☐
Improved health	☐	☐	☐	☐	☐
Increased energy	☐	☐	☐	☐	☐

12. Please **<u>rank</u>** the following barriers from 1 to 5 as to their impact on your activity level.
(1=greatest impact; 5=least impact; <u>use each number 1 through 5 only once</u>)

___ I had to exercise alone
___ I did not have time due to family/work/study commitments
___ My friends or family didn't want me to exercise
___ The weather was bad (hot, humid, rainy, cold)
___ I felt pain or discomfort while exercising

13. Please answer the following questions by filling in the spaces provided.
What is your current height? _____feet _____inches
What was your weight before you signed up for the program? _____lbs Now? _____lbs
What was your blood pressure before you signed up for the program? _____/_____
What is your blood pressure now? _____/_____
What was your cholesterol before you signed up for the program? _____ Now? ____

(Please continue on to page 4 on back)

Respond to questions 14 through 21 by placing a check in the appropriate box.

14. Before beginning the walking program, did you eat five fruits and vegetables per day?
☐ Yes, several days per week ☐ Yes, a few days per month
☐ Yes, once or twice per week ☐ Rarely/Never

15. While participating in the walking program, did you eat five fruits and vegetables a day?
☐ Yes, several days per week ☐ Yes, a few days per month
☐ Yes, once or twice per week ☐ Rarely/Never ☐ Not applicable

16. After completing the walking program do you still eat five fruits and vegetables a day?
☐ Yes, several days per week ☐ Yes, a few days per month
☐ Yes, once or twice per week ☐ Rarely/Never ☐ Not applicable

17. Was the information provided in the folder helpful? (Please check one)
☐ Yes, very helpful ☐ No, not at all helpful
☐ Yes, somewhat helpful ☐ I never looked at it

18. Were the people nice to you when you called in your mile markers and picked up your incentives/prizes? (Please check one)
☐ Yes, very nice ☐ No, not at all
☐ Yes, somewhat nice ☐ I mailed or e-mailed my mile markers in
☐ Not applicable, I did not collect any prizes

19. Did you reach the following mile markers? If yes, give your best estimate of the date.
100 miles ☐ Yes Date:(mo/day/year) _____/_____/_____ ☐ No, I did not reach 100 miles
300 miles ☐ Yes Date:(mo/day/year) _____/_____/_____ ☐ No, I did not reach 300 miles
600 miles ☐ Yes Date:(mo/day/year) _____/_____/_____ ☐ No, I did not reach 600 miles

20. Would you recommend the walking program to a friend?
☐ Yes, strongly recommend ☐ No, not at all
☐ Yes, with some reservation

21. How many months did you participate in the walking program?
_____months

22. Are you still using your pedometer?
☐ Yes, every day each week ☐ Yes, a few days per month
☐ Yes, once or twice per week ☐ No, my pedometer broke
☐ No, I no longer use my pedometer

Thank you for taking time to complete the survey. We appreciate your participation.
Please return the survey in the envelope provided.

Appendix D: Introductory Letter

Congratulations! for deciding to boost your health in a new, fun and exciting way by signing up for the Red Cedar Medical Center Community Walking Program.

Now, it is time to evaluate the effectiveness of the program and we need your help to do that. My name is Katie Marek and I am a graduate student at the University of Wisconsin-Stout in Menomonie. For my graduate thesis project I have chosen to evaluate the Red Cedar Medical Center Community Walking Program. I will be working with the walking program coordinator, Jan Pejsa, an R.N. at Myrtle Werth Hospital.

We are interested to hear from everyone, those who completed the walking program and those who did not. We would appreciate if you would take 10 minutes to complete the survey, place it in the envelope provided, seal the envelope, and return it to [company representative].

The survey is anonymous; there is no information on it that will allow us to identify you. The information that you provide on the survey will remain confidential and will allow us to evaluate the program.

Please return the attached survey by Friday August 15th, 2003.

Note: Questions or concerns about the research study should be addressed to the walking program coordinator [Jan Pejsa R.N. ph#: (715) 233-7888], the researcher [Katie Marek ph#: (715)568-5196] or the research advisor [Dr. Carol Seaborn ph#: (715) 232-2216]. Questions about the rights of research subjects can be addressed to Sue Foxwell, Human Protection Administrator, UW-Stout Institutional Review Board for the Protection of Human Subjects in Research, 11 Harvey Hall, Menomonie, WI, 54751, phone (715) 232-1126.