

Steps To a New You: A health-centered program that helps adults change physical activity eating habits and body image perceptions.

Martha Raidl PhD, RD

Grace Wittman, MS, RD

Marnie Spencer MS, RD

Laura Sant MS, RD

Marsha Lockard MS

Joey Peutz MS

University of Idaho Boise

Abstract

Sixty-five women completed a six week health-centered program called *Steps to a New You*. It focused on three areas: (1) healthy and pleasurable eating, (2) physically active living and (3) respect and acceptance of body size differences. Paired pre- and post-test results showed participants made significant changes in all three areas. Healthy eating changes included an increase in fruit and vegetable intake. Physical activity improvements included adding physical activity to their daily routine multiple times during the day and participating in low-intensity and moderate-intensity physical activity weekly. They also recorded daily steps using a pedometer and at baseline averaged approximately 4900 steps/day that increased to approximately 7600 steps/day by week six. Participants started to accept body size differences by changing their outlook from a negative to a neutral position.

Keywords: health-centered approach, healthy eating, physical activity, body image, health-centered curriculum

Introduction

The majority of Americans recognize the importance of being physically active and eating healthier (International Food Information Council 2009; American Dietetic Association 2008). However, results from various surveys indicate that most Americans are not meeting physical activity recommendations (Schiller, Heyman, and Barnes 2009) as well as not consuming the recommended amounts of whole grains (Whole Grains Council 2009), fruits and vegetables (Guenther et al. 2006; Casagrande et al. 2007; King et al. 2009), and low-fat dairy products (Wells and Buzby 2007).

This may be due to individuals focusing on a “weight-centered” approach rather than a “health-centered” approach when trying to change their eating and physical activity habits (Serdula et al. 1999). In a “weight-centered” approach, individuals are dissatisfied with their body size and shape and follow a restrictive diet and physical activity program to lose weight (Miller and Jacob 2001; Robison 1999; Robison 2005). These programs initially help people lose weight, but have limited success in getting people to eat healthier, be more active, and maintain that weight loss (Garner and Wooley 1991; Miller 1999; Mann et al. 2007).

A “health-centered” approach has individuals focus on healthy and pleasurable eating, physically active living and respect and acceptance of body size differences. Bacon et al. (2005) evaluated the effectiveness of a “health-centered” program called “Health At Every Size (HAES). They found that participants in the HAES program improved their level of physical activity, eating behaviors, as well as their self-esteem and body image.

In 2004, the University of Wyoming developed a new health-centered program called *Steps to a New You* as part of its multi-state Wellness IN (WIN) the Rockies project that focused on three concepts: physically active living (includes enjoying physical activity every day, participating in activities for the joy of feeling your body move, and making physical activity fun), respect and acceptance of body size differences and healthy and pleasurable eating (Liebman 2005). As one of the states involved in the WIN the Rockies project, the University of Idaho Extension helped test the short-term effectiveness of this program. The purpose of this project was to determine if adults that participated in the *Steps to a New You* program applied the aforementioned concepts of a “health-centered” approach and made healthier food choices, learned to enjoy their food, increased their level of physical activity, and made changes in their body image attitudes and perceptions.

Methods

Steps To a New You curriculum

The University of Wyoming adapted the *Steps to a New You* curriculum from two programs: (1) *A New You*, a curriculum developed by Outreach & Extension of the University of Missouri & Lincoln University that focused on healthful and pleasurable eating and body image attitudes and perceptions (Wardlaw 2005) and (2) *WIN Steps*, a University of Wyoming community-based pedometer walking program (Wardlaw 2003). Listed below are the titles and topics contained in the six classes of Steps to a New You.

Class 1: Let's Get Moving. Participants learned about: (1) the health-centered approach to living in a healthy body (this includes the concept of physically active living, healthful and pleasurable eating, and respecting body size differences), (2) setting goals to accomplish desired behaviors, (3) tracking steps using a pedometer, and (4) self-reflection and journaling to improve health.

Class 2: Hunger, Emotions and Eating. Participants learned about: (1) the internal signals of hunger and fullness, (2) dieting risks, (3) a non-diet approach to healthy weight, (4) eating styles and emotional eating triggers, and (5) alternatives to emotional eating.

Class 3: Healthful & Pleasurable Eating. Participants learned about: (1) portion sizes versus serving sizes, (2) MyPyramid, (3) making eating more satisfying and pleasurable so all foods fit (i.e., no foods are off limits and all foods can fit into a healthy diet), and (4) behaviors that help individuals make healthy eating choices.

Class 4: Step It Up. Participants learned: (1) how to identify barriers to being physically active and ways to overcome barriers, (2) how to become motivated to make daily physical activity a part of a healthy lifestyle, and (3) the benefits of being physically active.

Class 5: A Healthy Body and Mind. Participants learned: (1) about the various types of physical activities; (2) ways to increase physical activity in daily life, (3) about the false images of body perfection promoted in the media, (4) to challenge assumptions about body shapes and sizes, and (5) about unrealistic body images as symbols of success and happiness.

Class 6: Human Beauty. Participants learned: (1) the principles of body-size acceptance and self-acceptance, (2) behavior changes that promote wellness, (3) appreciation and respect for body-size diversity in others and self, (3) to appreciate human bodies in terms of artistic shapes and forms, (5) to examine body-size diversity issues and (6) to challenge personal size-prejudice beliefs.

Training: The lead researcher trained five University of Idaho (UI) Family and Consumer Sciences (FCS) Extension Educators during the fall of 2005 on the *Steps to a New You* (STNY) curriculum and the research protocol for this project. The FCS Extension Educators taught a single lesson each week over a six-week period. This project received approval by the University of Idaho Institutional Review Board.

Subjects: A convenience sample of adult participants was recruited from January 2006 - May 2008 in five rural Idaho counties using newspaper advertisements and newsletters published in the five Extension offices that were sent to individuals on their mailing list. Interested participants were asked to call the Extension office that was conducting these classes for more information. All subjects were screened by telephone. Those who participated in the project were: female and male adults (at least 18 years-old), had not previously participated in a “health-centered” program, did not have any physical limitations that prevented them from participating in a pedometer program, were not currently participating in a regular physical activity program, were not enrolled in a special dietary or weight loss program and received medical approval to participate in the program. All participants signed a Subject Consent form. Class size was kept small, between 7-10 individuals to allow for in-depth discussion of the topics and encourage all subjects to participate. Subjects paid to attend the classes and did not receive any compensation.

Data collection tools and data analysis: Participants completed a pre-(week 1) and post-(week 6) questionnaire and a weekly step log (weeks 1-6). On the questionnaire, they answered demographic, physical activity, food intake, pleasurable eating and body image questions. Demographic questions included age, gender, race, and ethnicity. Income and education level were not asked based on previous experience with participants’ being sensitive to these questions and refusing to answer these questions. All of the questions except those that covered food intake were those that had been developed and tested as part of the WIN the Rockies project (Liebman et al. 2003; Liebman et al. 2006). The food intake questions were developed based on the new MyPyramid food guidance released in 2005 and were piloted on 50 adults September-November 2005 and revised. The questions were tested for understandability and were not tested for reliability or validity.

A paired control design was used to determine the impact the six-class intervention had on the subjects. Paired responses from individuals’ pre- and post-questionnaires were analyzed and unpaired data was eliminated. Frequencies were calculated for the demographic questions, and means and standard deviations were calculated for the rest of the questions. In addition, Chi-square (X^2) analysis was used on questions that had categorical responses that included physical activity, pleasurable eating, and body image questions. T-tests were used on the food intake questions that had numerical responses. Significance was set at $p < 0.05$.

Participants recorded daily and weekly steps on their step logs. They received a Yamas Digiwalker SW200, an accurate and reliable pedometer (Schneider, Crouter, and Bassett 2004) and were instructed how to use and correctly wear their pedometer at the first class. Average daily steps per week were calculated from weeks 1– 6.

Two sets of data were analyzed to determine if participants incorporated the concept of physically active living: (1) responses from five physical activity behavior questions in the *Steps to a New You* questionnaire and (2) step log data from weeks 1-6. There were five questions that asked participants how frequently (daily, weekly, monthly) they participated in specific physical activity behaviors and each question had five choices. Each choice was assigned a numerical value (1-5) and the mean and standard deviations for each question were calculated. Two different categorical response scales were used, based on how frequently participants would complete that type of physical activity. The first categorical response scale was used when asking participants one question, i.e. how frequently (weekly or daily choices) they incorporated physical activity into their daily routine. The choices were: never or less than once a week = 1, 1-6 times a week =2, once a day =3, 2-3 times a day = 4, 4 or more times a day = 5. The second categorical response scale was used when asking participants how frequently they would participate in physical activity behaviors that would be done less frequently, in monthly or weekly frequencies. The second response scale was used for four questions that covered low-intensity physical activity, medium-intensity physical activity, and high-intensity physical activity and strength training. The choices to these questions were: never or less than once a month =1, 1-3 times a month =2, about once a week =3, 2 to 4 times a week= 4, and 5 or more times a week=5.

Step log data: Subjects were asked to record daily steps and their average daily steps per week were calculated from weeks 1-6. During week 1, participants were asked to maintain their current physical activity habits in order to get their baseline number of steps.

Two types of questions were asked to determine if participants incorporated the concept of healthy and pleasurable eating into their lives. To determine healthy eating habits, participants were asked their daily food intake from the five food groups contained in MyPyramid (MyPyramid 2005) using a food frequency questionnaire. The daily food intake amounts (cups, ounces, etc) listed for each food group question was based on MyPyramid recommendations. The questionnaire contained graphics to help subjects determine how much they were eating. For example, a closed women's fist was shown and described as being equivalent to 1 cup. All the researchers had conducted classes on food portions and were available to answer participants' questions to help them determine the amount of food they were consuming.

Participants responded to five body image statements in the questionnaire that covered the concept of "respect and accept body size differences." Two statements covered body size and

shape perceptions and participants used a five-point scale ranging from strongly disagree (1) to strongly agree (5) to respond. Three statements asked participants how satisfied they were with their body size, body shape, and overall appearance. They used a seven-point scale ranging from very dissatisfied (1) to very satisfied (7) to respond.

RESULTS

Demographic information

There were 70 participants that started the program at Week 1(baseline) and 65 participants at Week 6 (post), an attrition rate of seven percent. Table 1 lists the characteristics of the 65 participants who completed the pre- and post-surveys. Almost all of the participants were female and white (97 percent) and approximately 55 percent were between the ages of 41-60 years old. The mean age was 52 years old with an age range of 20-85 years old.

Table 1. Characteristics of participants that completed the pre- and post-surveys.

Characteristics		N	Percentage
Gender	Female	63	97
	Male	2	3
Race	White	63	97
	African-American	1	1.5
	American Indian	1	1.5
Ethnicity	Hispanic	10	15.4
Age Group (by 20 year increments)	20-40 years-old	12	18.5
	41-60 years-old	36	55.4
	61-80 years-old	15	23.1
	81-90 years-old	2	3.0
	Mean age	52 years-old	
	Age range	20-85 years-old	

Concept 1: Physically Active Living

Table 2 lists subjects' mean scores, standard deviations, and how frequently they reported they engaged in five physical activity behaviors at pre and post. All reported physical activity behaviors increased and three increased significantly. Participant-reported mean scores for adding physical activity to the daily routine increased from 2.4 to 3.6 ($p=0.0005$) and frequency increased from once a day to multiple times per day. Participant-reported mean scores and frequency for low-intensity physical activity increased from 2.8 to 3.3 ($p=0.0211$) and frequency increased from 1-3 times per month to about once a week. Participant-reported mean scores and frequency for medium-intensity physical activity increased from 2.9 to 3.6 ($p=0.0027$) and frequency increased from 1-3 times per month to about once a week.

Participant-reported mean scores for high-intensity physical activity and strength training behaviors increased from pre to post (1.6 to 2.0 and 1.8 to 2.3, respectively) but the increases were not statistically significant. The reported frequencies for both of these physical activity behaviors increased from never or less than once a month to 1-3 times a month.

Table 2. Self-reported changes in physical activity behaviors from pre to post.

Questions on Physical Activity Behaviors	Paired Pre- and Post-Scores Mean (SD) Frequency of physical activity behavior		Chi Square p
	Pre	Post	X ² p
How often do you add physical activity to your daily routine? ^a	2.4(1.0) 1-6 times a week	3.2 (1.2) Once a day	19.8061 0.0005
How often do you participate in low- intensity physical activities? ^b	2.8(0.9) 1-3 times a month	3.3 (0.76) About once a week	9.72350 0.0211
How often do you participate in moderate-intensity physical activities? ^b	2.9 (1.3) 1-3 times a month	3.6 (0.9) About once a week	16.2665 0.0027
How often do you participate in high- intensity physical activities? ^b	1.6 (0.9) Never or less than once a month	2.0 (1.1) 1-3 times a month	7.4019 0.1161

How often do you participate in strength training physical activities? ^b	1.8 (1.2) Never or less than once a month	2.3 (1.3) 1-3 times a month	9.1187 0.0583
---	--	--------------------------------	------------------

^a= choices include 1=never or less than once a week, 2=1-6 times a week, 3=once a day, 4=2-3 times a day, 5=4 or more times a day. “1st” categorical response scale

^b= choices include: 1=never or less than once a month, 2=1-3 times a month, 3=about once a week, 4=2 to 4 times a week, 5=5 or more times a week. “2nd” categorical response scale

Step log data

Table 3 contains Step Log data reported by the participants. During the study, participants increased the number of steps they accomplished from week 1 (at an average of 4858 steps/day) to week 2 by 40 percent (to an average of 6794 steps/day) and their activity classification improved from sedentary to low active (Tudor-Locke and Bassett 2004). At week 4 they recorded an average of 7711 daily steps/day and were classified as active. They maintained being classified as active through week 6.

Table 3. Step log data from weeks 1-6.

Week	N	Average Daily Steps (SD)	Percent Change Weekly	Percent Change from Baseline	Activity Classification
1 (Baseline)	35	4858 (3050)	-	-	Sedentary
2	30	6794(3602)	+40%	+40%	Low Active
3	28	7076 (2911)	+4.2%	+46%	Low Active
4	26	7711 (3255)	+9%	+59%	Somewhat Active
5	24	7520 (3462)	-2%	+55%	Somewhat Active
6	23	7665 (3160)	+2%	+58%	Somewhat Active

Concept 2: Healthy and pleasurable eating results

Participant-reported average daily intakes at pre- and post as well as p values are shown in Table 4. Subjects significantly increased their vegetable and fruit intake. Their reported daily vegetable consumption increased from 1.4 to 1.6 cups, ($p=0.02$) and daily fruit consumption increased from 1.2 to 1.4 cups ($p=0.01$).

Daily total grain (~3ounces), whole grain (~2 ounces), dairy (~2.5 servings) and protein (~ 4 ounces) consumption were reported as remaining constant throughout the study.

Pleasurable eating behavior was determined by asking participants how often they felt guilty when eating. Mean scores showed a decrease in how often they felt guilty, from 3.0 (Most of the time) to 2.7 (Some of the time), but it was not significant ($p=0.1157$).

Table 4. Healthy and Pleasurable Eating results.

Food Frequency Intake Results	Paired Pre to Post results		
	Pre Means (SD)	Post Means (SD)	P
Food groups (amounts)			
Total Grain (ounce equivalents) ^a	3.4 (1.7)	3.3 (1.4)	0.58
Whole Grain (ounce equivalents) ^a	2.3 (1.5)	2.2 (1.2)	0.38
Vegetables (cups) ^b	1.4 (0.9)	1.6 (0.9)	0.02
Fruit(cups) ^b	1.2 (0.9)	1.4 (0.9)	0.01
Dairy(cups) ^c	2.4 (0.8)	2.6 (0.8)	0.72
Protein(oz) ^d	4.1(1.8)	4.1 (1.6)	0.94
Pleasurable eating result	Mean (SD) Frequency	Mean (SD) Frequency	Chi Square p
How often do you feel guilty when you eat? ^e	3.0 (0.9) Most of the time	2.7 (0.8) Sometimes	7.4119 0.1157

^a = choices include 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 ounce equivalents

^b= choices include 0, .5, 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5 cups

^c= dairy cups calculated based on cups of milk and yogurt consumed and ounces of cheese consumed (1 cup of milk or yogurt, 1 ½ ounces of natural cheese, or 2 ounces of processed cheese can be considered as 1 cup from the milk group).

^d= based on ounces from meat, fish, poultry, eggs and choices include 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 ounces.

^e = choices include never=1, seldom=2, sometimes=3, most of the time=4, always=5.

Concept 3: Respect and accept body size differences

Table 5 lists participant's reported mean scores, standard deviations and the category into which the mean score fell. Participant-reported mean scores increased from pre to post for all five body image statements. There were three significant improvements in body image attitudes. One improvement was in body size and shape perception and two improvements were in body weight satisfaction and body shape satisfaction.

Participant-reported mean scores ($p=0.0054$) increased significantly from 1.9 (disagree) to 2.5 (neither disagree nor agree) when asked if they cared what others thought about their body size or shape. Participant-reported mean scores for satisfaction with body shape and body weight were similar. Participant-reported mean scores for body shape satisfaction significantly increased ($p=0.0152$) from 2.3 (moderately dissatisfied) to 3.4 (neutral); mean scores for body weight satisfaction significantly increased ($p=0.0034$) from 2.4 (moderately dissatisfied) to 3.4 (neutral).

Two reported body image perceptions did not significantly improve. The first was participants' perception that their abilities are more important than body size or shape. Participant-reported mean scores were initially high at 3.6 (agree) and increased to 3.9 (agree) at post. The second perception was participants' satisfaction in their overall appearance. Participant reported mean scores indicate that they started out feeling neutral (3.0) and ended up slightly satisfied (4.1).

Table 5. Participants' responses to body image statements.

Statements	Paired Pre to Post Results		
Body size and shape statements	Pre Mean scores (SD) Response category	Post Mean scores (SD)	Chi Square (X^2) p

		Response category	
I do not care what others think about my body size or shape. ^a	1.9 (0.8) Disagree	2.5 (0.8) Neither agree nor disagree	14.6757 0.0054
I think my abilities are more important than body size or shape. ^a	3.6 (0.9) Agree	3.9 (0.8) Agree	7.670 0.1042
Body satisfaction statements			
I am satisfied with my current weight. ^b	2.4 (1.9) Moderately dissatisfied	3.2 (1.9) Neutral	17.6872 0.0034
I am satisfied with my current shape. ^b	2.3(1.6) Moderately dissatisfied	3.4 (1.8) Neutral	15.7392 0.0152
I am satisfied with my overall appearance. ^b	3.1(1.7) Neutral	4.0 (1.8) Slightly satisfied	10.1012 0.12 05

^a= choices include: Strongly disagree (1), Disagree (2), Neither agree nor disagree (3) Agree (4), Strongly agree (5)

^b= choices include Very dissatisfied(1), moderately dissatisfied(2), slightly satisfied (3), neutral (4), slightly satisfied (5), moderately satisfied(6), very satisfied (7).

DISCUSSION

The health-centered approach in the *Steps to a New You* classes was successful in getting participants to increase their level of physical activity, make healthier food choices, and improve their body image attitudes and perceptions.

Results from the physical activity questions and the steps data showed that at week 1, when participants started the program, they were sedentary. They participated in physical activity behaviors either weekly or monthly, not daily. In the classes, they learned how to become physically active and set weekly physical activity goals, discussed how they would overcome barriers and eventually how they could increase their level of physical activity to meet these goals. During the six weeks the instructors reinforced making the physical activity goals realistic

which is an important component in getting people to stick with a physical activity program (Kahn et al. 2002; Task Force 2002; CDC 2001). By week 6, participants had increased their level of physical activity by incorporating physical activity into their daily routine, by participating in low- and moderate-intensity physical activities once a week, and high-intensity and strength training activities 1-3 times a month. These were modest increases in physical activity behaviors. Therefore, it is unlikely that participants met the physical activity recommendation of accumulating 2.5 hours per week or moderate intensity physical activity or 1 hour 15 minutes per week of vigorous intensity physical activity (US DHHS 2008).

The steps data quantified how participants increased their level of physical activity. Their average daily steps increased from 4858 at baseline to 7665 at week 6. Most Americans walk between 3000 – 5000 steps per day (Jordan et al. 2005) and the participants' baseline daily steps at 4858 put them into a “sedentary lifestyle” category (Tudor-Locke and Bassett 2004). Participants made steady progress in their average daily steps each week and their activity classification improved from sedentary to low active to somewhat active. At weeks 2 and 3 they walked approximately 6800 -7000 steps per day and were classified as “low active” which is defined as between 5,000 and 7,499 steps per day. From weeks 4-6 they walked between 7500 and 7700 steps per day and were classified as “somewhat active” which is defined as between 7500 to 9,999 steps per day. From weeks 1 -6 participants' average daily steps increased from 40-59 percent which is higher than the average 26.9 percent reported by other researchers (Bravata et al. 2007).

Participants did achieve physical activity benefits even though they did not reach the recommended 10,000 steps per day (Hatano 1993; Tudor-Locke and Bassett 2004). Researchers have found that walking 5000 steps per day improves fitness level (Church et al. 2007) and walking as little as one hour per week (Lee et al. 2001) can decrease the risk of developing coronary heart disease.

It was disappointing that more participants did not complete their step logs. When asked about whether they found the pedometer to be useful, one participant stated that “*I sit at work, and when I check it at lunch and see how few steps I have, it makes me get up and walk for 5-10 minutes.*” Other participants also mentioned that they thought the pedometer helped them be more active, but a majority of them stated that writing down their daily steps was “*too much work.*” Using cell phones for tracking and monitoring step data might be a possibility (Arsand et al. 2008).

Participants incorporated the concept of healthy eating by significantly increasing their fruit and vegetable intake but did not incorporate the concept of pleasurable eating. They made a modest increase of 0.2 cup per day in their fruit and vegetable intake. Daily vegetable consumption increased from 1.4 to 1.6 cups, which is less than the recommended 2 ½ cups per day. Daily fruit

consumption increased from 1.2 to 1.4 cups, which was close to the recommended 1.5-2 cups per day. Even though nearly two-thirds of Americans (64 percent) report they are making healthy changes to their diet (IFIC 2009), it is estimated that between 11-25 percent of Americans meet fruit and vegetable recommendations (Guenther et al. 2006; Casagrande et al. 2007).

The results from the rest of the food intake survey indicate that participants had low intakes of grain, whole grain, dairy and protein. These low intakes could have been due to participants having difficulty deciding how much they consumed during an entire day, even though graphics were added to the food-intake questionnaire to help them estimate their food intake. In addition, many individuals underreport their food intake (Muhlheim et al. 1998; Scagliusi et al. 2003; Abbot et al. 2008).

Pleasurable eating was measured by asking participants how frequently they felt guilty when eating. Participants decreased how frequently they felt guilty about eating, from most of the time to sometimes. A 2006 social trends survey found that only 39 percent of Americans said they enjoyed food and eating (Pew 2006). Researchers theorize that individuals who enjoy eating have a positive attitude toward food, accept eating all types of foods, and are intuitive eaters (eat when hungry and stop when full) (Satter 2007). In the *Steps to a New You* program, these topics were covered in two classes and the six-week period may not have been long enough for these concepts to become internalized. Hawks et al. (2008) found a 15-week health course that discussed intuitive eating helped college students achieve higher pleasurable food and eating scores.

The participants implemented the concept of “respecting and accepting body size differences” by developing a more positive attitude toward their body size and shape plus becoming more satisfied with their body shape, weight, and overall appearance. For the most part, their body image attitudes improved from being slightly negative to feeling neutral about their body. Garner (1997) estimates that the majority of women (56 percent) have a negative body image and getting women to have a neutral perception of their body could be considered an achievement.

Researchers have found that a large part of women’s body dissatisfaction comes from the media, focusing on models that do not represent real women’s bodies (Groesz, Levine, and Murnen 2002). The *Steps to a New You* classes taught participants what role the media played in women having a negative view of their bodies, and taught them to challenge assumptions about body shapes and sizes. The participants may have used this information to help them become more accepting and realistic of their body size and shape, resulting in more positive body image scores. Other researchers have found that once women learned how unrealistic media standards for female beauty were, that they were less likely to compare them to these media standards and improve their body image perceptions (Posavac and Posavac 2001)

Overall, the changes that occurred in the participants might be considered small or modest. However, a joint task force of the American Society of Nutrition, the Institute of Food Technologist, and the International Food Information Council support a “small changes” approach (Hill 2009). They have found that small changes are the ones that are most likely to stick and can yield significant health outcomes. In addition, once these small changes become habits, then it is possible that participants would be willing to make additional changes.

Limitations: There were several limitations of this study. The first was that participants were mainly female and white and the results from this study may not be applicable to a more diverse group of individuals. The second limitation is that the changes in physical activity behaviors, eating behaviors, and body image perceptions were based on self-report, which has some drawbacks. These include subjects reporting what they believe the researcher expects to see, exaggerating the positive aspects of their behaviors (Cook and Campbell, 1979) and subjects inability to accurately recall past behaviors (Schacter 1999). A third limitation is the short time period, six weeks, that this study lasted and the lack of follow-up data. Some individuals may need a longer time period to implement and maintain behavior changes. One way to resolve these limitations is to conduct the study using a larger sample, include a follow-up and provide individuals with materials, such as newsletters, that reinforce the main principles of the program.

References

Abbot, J.M., C.A. Thompson, J. Ranger-Moore, P.J. Teixeira, T.G. Lohman, D.L. Taren, E. Cussler, S.B. Gong, and L.B. Houtkooper. 2008. Psychosocial behavioral profile and predictors of self-reported energy underreporting in obese middle-aged women. *Journal of the American Dietetic Association*, 108(1):114-9.

American Dietetic Association. 2008. Nutrition and You: Trends 2008. Accessed on July 26, 2010 at: <http://www.eatright.org/search.aspx?search=Trends+2008&type=Site>

Arsand, E., O.A. Olsen, R. Varmedal, W. Mortensen, and G. Hartvigsen. 2008. A system for monitoring physical activity data among people with type 2 diabetes. *Studies in Health Technology and Informatics* 136,113-118.

Bacon, L., J. Stern, M. Van Loan, and N. L. Keim. 2005. Size acceptance and intuitive eating improves health for obese female chronic dieters. *Journal of the American Dietetic Association* 105(6):929-936.

Bravata, D.M, C. Smith-Spangler, V. Sundaram, A.L. Gienger, N. Lin, R. Lewis, C.D. Stave, I. Olkin, and J.R. Sirard. 2007. Using pedometers to increase physical activity and improve health: a systematic review. *Journal of the American Medical Association* 298(19):2296-304.

Casagrande, S.S., Y. Wang, C. Anderson, and T.L. Gary. 2007. Have Americans increased their fruit and vegetable intake? The trends between 1988 and 2002. *American Journal of Preventive Medicine* 32(4):257-63.

Centers for Disease Control and Prevention. 2001. Increasing physical activity. A report on recommendations of the Task Force on Community Preventive Services. *Morbidity and Mortality Weekly Report* 50 (RR-18):1-16. Accessed on July 26, 2010 at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5018a1.htm>

Church, T.S., C.P. Earnest, J.S. Skinner, and S.N. Blair. 2007. Effects of different doses of physical activity on cardiorespiratory fitness among sedentary, overweight or obese postmenopausal women with elevated blood pressure: a randomized controlled trial. *Journal of the American Medical Association* 297:2081-2091

Cook, T. D., and D.T. Campbell. 1979. Quasi-experimentation: Design and analysis issues. Boston, MA: Houghton Mifflin Company.

Garner, D., and S. Wooley. 1991. Confronting the failure of behavioral and dietary treatments for obesity. *Clinical Psychology Review* 11:748-754.

Garner, D. 1997. The 1997 body-image survey results, *Psychology Today* 30: 30–84.

Groesz, L.M., M.P. Levine and S.K. Murnen. 2002. The effect of experimental presentation of thin media images on body satisfaction: A meta-analytic review. *International Journal of Eating Disorders* 31:1-16.

Guenther, P.M., K.W. Dodd, J. Reedy, and S.M. Krebs-Smith. 2006. Most Americans eat much less than recommended amounts of fruits and vegetables. *Journal of the American Dietetic Association* 106(9):1371-9.

Hatano, Y. 1993. Use of the pedometer for daily walking-exercise, *Journal of International Council for Health, Physical Education, Recreation, Sport and Dance*. **29**: 4–8.

Hawks, S.R., H. Madanat, T. Smith, and N. De La Cruz. 2008. Classroom approach for managing dietary restraint, negative eating styles, and body image concerns among college women. *Journal of American College Health* 56 (4); 359-366.

Hill J.O. 2009. Can a small-changes approach help address the obesity epidemic? A report of the Joint Task Force of the American Society for Nutrition, Institute of Food Technologists and International Food Information Council. *American Journal of Clinical Nutrition* 89:477-484.

International Food Information Council Foundation. 2009. The 2009 Food and Health Survey: Consumer attitudes toward food, nutrition & health. Accessed on July 26, 2010

at: <http://www.ific.org/research/foodandhealthsurvey.cfm>

Jordan, A.N., G.M. Jurca, C. Tudor-Locke, T.S. Church, and S.N. Blair. 2005. Pedometer indices for weekly physical activity recommendations in postmenopausal women. *Medicine and Science in Sports & Exercise* 37(9):1627 –1632.

Kahn, E.B., L.T. Ramsey, R.C. Brownson, G.W. Heath, E.H. Howze, K.E. Powell, E.J. Stone, M.W. Rajab, P. Corso, and the Task Force on Community Preventive Services. 2002. The effectiveness of interventions to increase physical activity: a systematic review. *American Journal of Preventive Medicine* 22(4S):73-107.

King, D., A.G. Mainous, M. Carnemolta, and C. J. Everett. 2009. Adherence to healthy lifestyle habits in US adults, 1988-2006. *The American Journal of Medicine* 122:528-534

Lee, I.M., K.M. Rexrode, N.R. Cook, J.E. Manson, and J.E. Buring. 2001. Physical activity and coronary heart disease in women: is "no pain, no gain" passe? *Journal of the American Medical Association* 285:1447-1454.

Liebman, M., S. Pelican, S.A. Moore, B. Holmes, M.K. Wardlaw, L.M. Melcher, M. Raidl, B. Wheeler, and G.W. Haynes. 2006. Dietary intake, eating behavior- and physical activity-related determinants of high body mass index in the 2003 Wellness IN the Rockies cross-sectional study. *Nutrition Research* 26: 111-117.

Liebman, M., S. Pelican, S.A. Moore, B. Holmes, M.K. Wardlaw, L.M. Melcher, A.C. Liddil, L.C. Paul, T. Dunnagan, and G.W. Haynes. 2003. Dietary intake, eating behavior, and physical activity-related determinants of high body mass index in rural communities in Wyoming, Montana, and Idaho. *International Journal of Obesity* 17:684-692.

Liebman, M. 2005. Promoting healthy weight: Lessons learned from WIN the Rockies and other key studies. *Journal of Nutrition Education and Behavior* 37:S95-S100.

Mann, T., A.J. Tomiyama, E. Westling, A-M. Lew, B. Samuels, and J. Chatman, J. 2007. Medicare's search for effective obesity treatments: Diets are not the answer.... *American Psychologist* 62(3) 220-233.

Miller, W.C., and A.V. Jacob. 2001. The health at any size paradigm for obesity treatment: the scientific evidence. *Obesity Reviews* 2:37-45. Accessed on July 26, 2010

at <http://www3.interscience.wiley.com/cgi-bin/fulltext/118998100/PDFSTART>

Miller, W.C. 1999. How effective are traditional dietary and exercise interventions for weight loss? *Medicine and Science in Sports & Exercise* 31:1129-1134.

Muhlheim, L.S., D.B. Allison, S. Heshka, and S.B. Heymsfield. 1998. Do unsuccessful dieters intentionally underreport food intake? *International Journal of Eating Disorders* 24(3):259-66.

MyPyramid: U.S. Department of Agriculture, Center for Nutrition Policy and Promotion, MyPyramid, Accessed on July 26, 2010 at <http://www.MyPyramid.gov>

Pew Research Center. 2006. Eating more, enjoying less. Released April 19, 2006, pg 1-24. Accessed July 26, 2010 at <http://pewresearch.org/assets/social/pdf/Eating.pdf>

Posavac, H.D., and S.S. Posavac. 2001. Reducing the impact of media images on women at risk for body image disturbance: Three targeted interventions. *Journal of Social and Clinical Psychology* 20(3):324-340.

Robison, J. 2005. Health at every size: Toward a new paradigm of weight and health. *Medscape General Medicine* 7(3):13. Accessed on July 26, 2010 at <http://www.medscape.com/viewarticle/506299>

Robison, J. 1999. Weight, health & culture; shifting the paradigm for alternative healthcare. *Alternative Health Practitioner* 5:1-25.

Satter, E. 2007. Eating competence: Definition and evidence for the Satter Eating Competence Model. *Journal of Nutrition Education and Behavior* 39:S142-S153.

Scagliusi, F.B., V.O. Polacow, G.G. Artioli, F.B. Benatti, and A.H. Lancha Jr. 2003. Selective underreporting of energy intake in women: magnitude, determinants, and effect of training. *Journal of the American Dietetic Association* 103(10):1306-13.

Schacter, D. L. 1999. The seven sins of memory: Insights from psychology and cognitive neuroscience. *American Psychology* 54:182-203.

Schiller, J.S., K.M. Heyman, and P.M. Barnes. 2009. Early release of selected estimates based on data from the January–March 2009 National Health Interview Survey. Hyattsville, MD: National Center for Health Statistics. September 2009. Accessed July 26, 2010 at <http://www.cdc.gov/nchs/data/nhis/earlyrelease/earlyrelease200909.pdf>

Schneider, P.L., S.E. Crouter, and D.R. Bassett. 2004. Pedometer measures of free-living physical activity: Comparison of 13 models. *Medicine and Science in Sports & Exercise* 36(2): 331-335.

Serdula, M.K., A.H. Mokdad, D.F. Williamson, J. Galuska, M. Mendlein, and G.W. Heath. 1999. Prevalence of attempting weight loss and strategies for controlling weight. *Journal of the American Medical Association* 282:1353-1358.

Task Force on Community Preventive Services. 2002. Recommendations to increase physical activity in communities. *American Journal of Preventive Medicine* 22(4S):67-72.

Tudor-Locke, C., and D.R. Bassett Jr. 2004. How many steps/day are enough?: Preliminary pedometer indices for public health. *Sports Medicine* 34(1):1-8.

U.S. Department of Health and Human Services. 2008. The 2008 Physical Activity Guidelines for Americans. Accessed on July 26, 2010

at: <http://www.health.gov/paguidelines/pdf/paguide.pdf>

Wardlaw, M.K. 2005. A new you: Health for every body: Helping adults adopt a health-centered approach to well-being. *Journal of Nutrition Education and Behavior* 37:S103-S106.

Wardlaw, M.K. *WIN Steps*, 2003. Available

at: http://www.uwyo.edu/WINTHEROCKIES_EDUR/WINSteps.asp Accessed on July 26, 2010.

Wells, H.F. and J.C. Buzby. 2007. Americans' dairy consumption below recommendations. *Amber Waves*, Accessed on July 26, 2010

at: <http://www.ers.usda.gov/amberwaves/november07/findings/americansdairy.htm>

Whole Grains Council, 2009. Making half your grains whole conference, April 20-22, 2009.

NPD Group, Whole Grain Consumption Data, Accessed on July 26, 2010

at: <http://www.wholegrainscouncil.org/files/3.AreWeThereYet.pdf>