

The Impact of Health Switch an Eight Week Healthy  
Weight Loss Program on Participant's  
Self-Efficacy Beliefs  
In Losing Weight


by

Cheri Rott


A Research Paper  
Submitted in Partial Fulfillment of the  
Requirements for the  
Master of Science Degree  
in

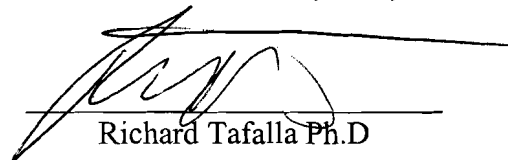
Food and Nutritional Sciences

Approved: 6 Semester Credits

  
Carol Seaborn Ph.D., R.D., C.D., C.F.C.S.  
Research Advisor

Thesis Committee Members:

  
Charlene Schmidt Ph.D., R.D., C.D.

  
Richard Tafalla Ph.D

The Graduate School

University of Wisconsin-Stout

June, 2007

**The Graduate School  
University of Wisconsin-Stout  
Menomonie, WI**

**Author:** Rott, Cheri A.

**Title:** *The Impact of Health Switch an Eight Week Healthy Weight Loss Program on Participant's Self-efficacy Beliefs in Losing Weight.*

**Graduate Degree/ Major:** MS Food and Nutritional Sciences

**Research Adviser:** Carol Seaborn, Ph.D.

**Month/Year:** June, 2007

**Number of Pages:** 112

**Style Manual Used:** American Psychological Association, 5<sup>th</sup> edition

ABSTRACT

As sixty percent of Americans are overweight or obese, the objectives of this research were to design and implement a weight loss program fostering healthy eating and to improve self-efficacy. The experimental group (n=21) which participated in the eight week Health Switch and a control group (n=10) were recruited from the Red Cedar Medical Center, Menomonie WI, fall, 2006. The Weight Efficacy Lifestyle Questionnaire (WEL) was administered to both groups at weeks zero, four and eight. The WEL survey includes self-efficacy questions for controlling eating divided into five subcategories: negative emotion, availability, social pressure, positive activities, and physical discomfort.

Two way ANOVA with repeated measures over time showed that the experimental group lost significantly more weight ( $p=.04$ ). The mean weights of the

control group at weeks zero, four and eight was  $192 \pm 46$  lbs,  $190 \pm 45$  lbs, and  $192 \pm 44$  lbs and the mean weights for the experimental groups were  $196 \pm 47$  lbs,  $195 \pm 47$  lbs, and  $190 \pm 44$  lbs, respectively. The experimental group improved significantly compared to the control group in one of the five categories of self efficacy, positive activities ( $p=.05$ ). The finding of  $p=.071$  in the subcategory of physical discomfort suggests that additional time and/or a larger sample size was needed. The conclusion is that a well designed nutrition education program which includes, mindfulness in eating, portion control, and a focus on moving away from dieting to making healthier choices daily, across an eight week period promotes weight loss.

## Acknowledgments

I would like to take this time to acknowledge and offer my heartfelt thanks to the following people who helped me in through this thesis process. A special thanks to Dr. Carol Seaborn, my thesis advisor who kept me on tract with weekly meetings and spent endless hours helping me work on my project. I would also like to thank my other thesis committee members, Dr. Richard Tafalla for his assistance with chapter four and his statistical analysis help. I would like to thank Dr. Char Schmidt who assisted in helping me recruit undergraduates and for calming my nerves when I didn't think I would get through the data gathering process. A special thanks to Christine Ness for helping me run and evaluate my data and for answering my endless statistical questions. I would like to thank Nicole Evers and Jan Pejsa for their help in getting Health Switch approved and a reality and for their support through the years. I would also like to thank Red Cedar Medical Center for the use of their facility. I would like to thank the following undergraduates who helped with Health Switch, I enjoyed working with you all; Krista Baum, Susan Fuller, Shane Medin, Kathryn Hang, Charity Cook, and Sarah Winther. I would like to express a special thank you to my husband Gary, my sons; Derrick and Jordan and friends (you know who you are) for the patience and support you have provided over the past three years as I worked towards making my dreams a reality. Thanks to Jill, who has been my friend forever and is my biggest supporter of everything I do – thanks for all of the help in proof-reading and for all of your support. Finally, I would like to thank God for the strength and guidance he has given to me in my life and will continue to give as I move into the future.

## TABLE OF CONTENTS

	Page
.....	
ABSTRACT.....	ii
LIST OF TABLES.....	viii
LIST OF FIGURES.....	x
CHAPTER I: INTRODUCTION.....	1
<i>Statement of the Problem</i> .....	2
<i>Purpose of the Study</i> .....	2
<i>Research Objectives</i> .....	3
<i>Assumptions of the Study</i> .....	3
<i>Limitations of the Study</i> .....	4
<i>Methodology</i> .....	4
CHAPTER II: LITERATURE REVIEW.....	5
<i>Obesity</i> .....	5
<i>Estimating Resting Energy Expenditure in Adults</i> .....	7
<i>Self-efficacy</i> .....	8
<i>Weight loss programs</i> .....	14
CHAPTER III: METHODOLOGY.....	21
<i>Subject Selection and Description</i> .....	21
<i>Instrumentation</i> .....	22
<i>Health Switch -Nutrition Education Classes</i> .....	23
<i>Data Collection Procedures</i> .....	39
<i>Data Analysis</i> .....	41

<i>Limitations</i> .....	41
CHAPTER IV: RESULTS.....	42
CHAPTER V: DISCUSSION.....	61
<i>Summary</i> .....	61
<i>Limitations of the Study</i> .....	61
<i>Demographics</i> .....	62
<i>Nutrition Education</i> .....	63
<i>Self-efficacy principals used in nutrition education</i> .....	67
<i>Undergraduate Students</i> .....	70
<i>What the investigator learned during the eight week program</i> .....	71
<i>Conclusions</i> .....	72
<i>Recommendations</i> .....	73
References.....	76
Appendix A: Protection of Human Subjects.....	82
Appendix B: Weight Loss Self-Efficacy Survey.....	84
Appendix C: Subcategory of Survey Questions.....	85
Appendix D: Motivational E-mail.....	86
Appendix E: 1600 Calorie Nutrition Tracker.....	88
Appendix F: Goal Setting Sheet.....	90
Appendix G: Physical Activity Calories per Minute.....	91
Appendix H: Fruit Quiz.....	92
Appendix I: Consent Form.....	93
Appendix J: Survey Questions.....	96

Appendix K: Table 13; Question number 1.....	97
Appendix L: Table 14; Question number 2.....	98
Appendix M: Table 15; Question number 3.....	99
Appendix N: Table 16; Question number 4.....	100
Appendix O: Table 17; Question number 5.....	101
Appendix P: Table 18; Question number 6.....	102
Appendix Q: Table 19; Question number 7.....	103
Appendix R: Table 20; Question number 8.....	104
Appendix S: Table 21; Question number 9.....	105
Appendix T: Table 22; Question number 11.....	106
Appendix U: Table 23; Question number 12.....	107
Appendix V: Table 24; Question number 13.....	108
Appendix W: Table 25; Question number 14.....	109
Appendix X: Table 26; Question number 15.....	110
Appendix Y: Table 27; Question number 17.....	111
Appendix Z: Table 28; Question number 18.....	112

## List of Tables

Table 1: Outline of Topics Introduced.....	30
Table 2: Frequency Counts of Mean Age of Control and Experimental Groups.....	40
Table 3: Mean Body Weights at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures.....	42
Table 4: Mean Scores for Availability Category Questions at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures.....	44
Table 5: Mean Scores for Negative Emotions Category Questions at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures.....	46
Table 6: Mean Scores for Social Pressure Category Questions at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures.....	48
Table 7: Mean Scores for Physical Discomfort Category Questions at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures.....	50
Table 8: Mean Scores for Positive Activities Category Questions at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures.....	52



Table 9: Mean Scores for Question 10: <i>I can resist eating when I'm depressed or down</i> at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures.....	54
Table 10: Mean Scores for Question 16: <i>I Can Resist Eating Even When I am at a Party</i> at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures.....	56
Table 11: Mean Scores for Question 19: <i>I Can Resist Eating Just Before Going to Bed</i> at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures.....	58
Table 12: Health Switch – 8 Week Weight Loss Class Evaluation.....	60

## List of Figures

Figure 1: Change of weight over time. ....	43
Figure 2: Mean scores for availability subcategory questions at week zero, week four, and week eight.....	45
Figure 3: Mean scores for negative emotions subcategory questions at week zero, week four, and week eight.....	47
Figure 4: Mean scores for social pressure subcategory questions at week zero, week four, and week eight.....	49
Figure 5: Mean scores for physical discomfort subcategory questions at week zero, week four, and week eight.....	51
Figure 6: Mean scores for positive activities subcategory questions at week zero, week four, and week eight.....	53
Figure 7: I can resist eating even when I am depressed means.....	55
Figure 8: I can resist eating even when I am at a party means.....	57
Figure 9: I can resist eating just before going to bed.....	59

## Chapter I: Introduction

Since more than 60% of Americans are classified as overweight or obese (Zelman, 2006), the majority of the population can benefit from losing some weight. Americans spend billions of dollars each year on gadgets, pills, and quick fixes in hopes of losing weight and, unfortunately, a lot of these dollars are spent on fraudulent products that make promises of rapid weight loss and success that never come true. People need to find a weight loss program that helps not only motivate, but educate them to make healthy choices for a lifetime. Data has shown that even a 10% decrease in weight can significantly reduce high blood pressure, LDL cholesterol, and insulin resistance (Centers for Disease Control and Prevention, 2006).

A major problem with weight loss programs is that people lose motivation to continue after only a short period of time because they see the changes in their eating as a diet, not lifestyle changes. With the obesity crisis on the rise, there are not only more people needing to lose weight, but also an increase in the amount of weight that needs to be lost overall. The fact that more people have more weight to lose is requiring them to stay motivated in a weight loss program for longer periods of time. People need to change the way they think and feel about eating in a healthy way. A program needs to be designed that helps keep them motivated to incorporate healthy eating into their lives so their weight loss goals can be reached. Additionally, the program needs to address maintenance so that the participants can work at maintaining the weight they have lost. Many programs have been shown to produce weight loss, but few, if any, have been successful in maintaining weight loss (Hill, Thompson and Wyatt, 2005). Finally, the program has to help motivate participants to continue until they reach their health goals.

A person's level of self-efficacy may influence his or her ability to succeed. Without a sense of self-efficacy, losing weight can be a daunting task. With people needing more time to lose weight -- and the natural tendency for people to lose motivation after a long period of time -- the challenge is to find a weight loss program that will not only educate the participants on the nutrition information they need, but help them grow skills that will increase their self-efficacy and keep them motivated for the long haul.

#### *Statement of the Problem*

Employees, spouses, and friends from Red Cedar Medical center who wish to participate in Health Switch, an eight week healthy nutrition program, will have the opportunity to participate in the study beginning in the fall of 2006 to determine if their self-efficacy in regards to weight loss increases during and after the nutrition program through nutrition education.

#### *Purpose of the Study*

The purpose of this study is to determine the impact of Health Switch, a healthy nutrition program, and the self-efficacy of the participants before, during, and at the conclusion of the program. This survey will contain questions that will belong to one of the following five categories: negative emotions, availability, social pressure, positive activities, and physical discomfort. Self-efficacy will be measured to determine if it improves over the eight weeks in all categories or in just specific categories or if none at all.

A control group will be compared to the group participating in the eight week Health Switch program. The control group will not participate in Health Switch or any other weight loss program while participating in the study.

#### *Research Objectives*

The specific objectives for this study are:

1. To measure the participants' self-efficacy and see if it effects success in the program, specifically, to measure self-efficacy with regard to:
  1. Handling negative emotions that are tied to overeating.
  2. Availability of foods that are tied to overeating.
  3. Social pressures and overeating.
  4. Physical discomfort and overeating.
  5. Positive activities and overeating.

#### *Assumptions of the Study*

Assumptions in this study are that self-efficacy will improve at the end of the eight-week weight loss program in the experimental group. Another assumption is that the participants will come to the class in the action stage of change from the Transtheoretical model, ready to lose weight and change his or her health for the better. Another assumption is that the participants will answer the survey to accurately depict how he or she feels before, during, and after the eight week weight loss class.

### *Limitations of the Study*

One limitation of this study is that it was very difficult for the researcher to find a control group to compare against the study group. The control group needed to be similar to the study group in age, sex and BMI.

With more than 27 participants in the nutrition class (only 21 participated in the surveys), it was difficult for the researcher to work individually with participants who were struggling or who were not in the action stage of change from the Transtheoretical model.

Finally, weight loss is a multi-dimensional process that can be affected by many variables such as metabolism, body fat percentage, environment, and stress. Therefore, it may be difficult to determine if self-efficacy has or has not changed for participants through the nutrition education program.

### *Methodology*

The Weight Efficacy Lifestyle Questionnaire (WEL) survey was distributed to the experimental nutrition class members who were willing to participate in the study on weeks one, four, and eight of the program. The control group submitted surveys on week one, four, and eight (starting four weeks after the class participants) via e-mail and did not attend classes. Data were analyzed using SPSS version 14 for Windows (2006).

## Chapter II: Literature Review

The literature review begins with discussing the obesity epidemic facing the United States. The next topic discussed is calculating resting energy expenditure in adults, self-efficacy in weight loss and the role it plays in fighting obesity. Finally, weight loss strategies and group weight loss classes will also be reviewed.

### *Obesity*

Obesity is a serious problem in American society. The prevalence of obesity, the seriousness of the consequences of remaining obese and the resistance to successful treatment cause obesity to be a major challenge to medical and psychological communities (Brownell, 1982). In 2004, the Centers for Disease Control reported that Americans are eating more than ever, and women in particular are eating over 300 more calories a day than they did in 1971. Two-thirds of Americans are overweight, yet less than one-third get regular exercise (Radford, 2006).

During the past 20 years, obesity among adults has risen significantly in the United States. The latest data from the National Center for Health Statistics showed that 30 percent of U.S. adults 20 years of age and older, over 60 million people, are obese (Centers for Disease Control and Prevention, 2006).

The increasing rate of obesity is of concern because of the implications for Americans' health. Being overweight or obese increases the risk of many diseases and health conditions, including the following:

- 1) Hypertension
- 2) Dyslipidemia (for example, high total cholesterol or high levels of triglycerides)
- 3) Type 2 diabetes

- 4) Coronary heart disease
- 5) Stroke
- 6) Gallbladder disease
- 7) Osteoarthritis
- 8) Sleep apnea and respiratory problems
- 9) Some cancers like endometrial, breast, and colon (Centers for Disease Control and Prevention, 2006).

Obesity is defined as an excess of body fat or adipose tissue. Normally, 10% to 17% of body mass is adipose tissue; obesity is 20% or more of body mass composed of adipose tissue (Kalodner & Delucia, 1990). Since direct measurement of body fat is difficult, body weight, BMI, and waist-hip ratios are often used to assess obesity and risk factors for other diseases.

Risk assessment of the overweight and obese patient is an important and necessary first step in the treatment process (Kushner & Blatner, 2005). Risk classification begins with determination of body mass index (Kushner & Blatner).

Body mass index (BMI) is one of several calculations used to measure overweight and obesity. BMI is a mathematical formula that is used to assess relative body weight to body fat. The BMI measure correlates highly with body fat. BMI is calculated as weight in kilograms divided by the square of the height in meters ( $\text{kg}/\text{m}^2$ ). A BMI of 25.9 to 29.9 means that the individual is overweight. A BMI of 30 or more means the individual is obese. There are three levels of obesity in the BMI calculation. Level I obesity is a calculation of 30 to 35.9. Level II obesity is a calculation of 36 to 39.9 and Level III is



extreme obesity with a BMI calculation of 40 or greater (Centers for Disease Control and Prevention, 2006).

Another measurement used in measuring risks of obesity is the waist-hip ratio equation. In a study by Feitosa, et al., (2000), waist-hip ratio was discussed as being a strong predictor of hypertension, diabetes mellitus and coronary heart disease and was more strongly associated with the occurrence of coronary heart disease than was body mass index (BMI).

People who carry excess weight around their trunk area are at higher risk for developing diseases associated with obesity versus persons who carry most of their weight around their hips and buttocks (Kushner & Blatner, 2005). This ratio is determined by measuring the circumference of the waist and hips of an individual and then dividing the waist by hip to determine their waist-hip ratio. A waist-hip measurement in men of .9 or higher and a measurement of .8 or higher for a female can indicate a higher risk factor for obesity-related diseases (Lee & Nieman, 2003).

#### *Estimating Resting Energy Expenditure in Adults*

Body weight gain is the result of a chronic imbalance between energy intake and energy expenditure (Ravussin & Tataranni, 1997). The association between high fat intake and obesity lies in the ability of fat to increase energy intake, reduce energy expenditure, or both (Ravussin & Tataranni).

The measurement of energy expenditure is most accurately obtained by indirect calorimetry using a ventilated hood (Jequier, 1987). Indirect calorimetry measures oxygen consumption and carbon dioxide production to calculate resting energy expenditure (REE) and respiratory quotient (Matarese, 1997). The respiratory quotient

can be determined from indirect calorimetry to determine substrate utilization and be used to alter the patient's nutrition support regimen (Matarese).

However, this is often an impractical procedure and in the field there has been research done to find equations that will effectively determine the REE of the patient. There are several equations available, the Harris Benedict equation was established in 1919 and was widely used until the Mifflin St Jeor Equation in 1990 was recommended as the standard for calculating REE by the *Application of indirect calorimetry in ADA Evidence Based Guides for Practice Expert Consensus Panel* of the American Dietetic Association (St. Jeor et al., 2004).

In this study they found that none of the equations could replace the accuracy of a personalized indirect calorimetry measurement; however the Mifflin St. Jeor Equation was found to be the most accurate (St. Jeor, et al., 2004) and came closest to matching the indirect calorimetry.

### *Self-efficacy*

Perceived self-efficacy is defined as a person's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives (Bandura, 1994). A strong sense of efficacy enhances human accomplishment and personal well-being in many ways. According to Bandura, people with high self-efficacy approach difficult tasks as challenges to be mastered, rather than as threats to be avoided. Generally people who doubt their capabilities (or have low self-efficacy) will avoid tasks that they view as too difficult or are personal threats. When persons with low self-efficacy face difficult tasks, they tend to focus on their personal deficiencies and on

obstacles they will encounter (Bandura). People with low self-efficacy tend to give up easily when faced with difficult tasks.

According to Bandura (1994), people's beliefs about their efficacy can be developed by four main sources of influence:

1. The best way to create a strong sense of efficacy is by mastering experiences. Success will help build a belief in one's personal efficacy. Failure however can undermine it, especially if the failure occurs before a sense of self-efficacy is mastered.
2. The second way of increasing self-efficacy is through experiences that are provided by social models. Modeling influences do more than set a social standard against which to judge one's own capabilities. People look for models that possess the competencies to which they aspire Bandura (1994). By watching the model's behavior and through listening to them about their ways of thinking, good models share knowledge and teach others effective ways to reach their desired goals.
3. Social persuasion is the third way to increase a person's self-efficacy. People who are persuaded verbally that they possess the abilities to master given activities are more likely to try harder and be resilient during difficult times. However, according to Bandura (1994), it is more difficult to instill personal efficacy by social persuasion alone than it is to undermine it. Someone can increase self-efficacy through social persuasion only to have it destroyed by unwanted outcomes or from some other person who undermines the words of encouragement.
4. People also rely partly on their somatic and emotional states in judging their capability in performing a difficult task. Bandura (1994) went on to discuss that these people are affected by stress, aches and pains, and moods to name just a few. But it is not

the actual emotional and physical reaction that is important, but rather how they are perceived and interpreted. People with high self-efficacy will probably view their states of emotion much differently than people with low self-efficacy. The aches and pains from physical activity for instance in a low self-efficacy person could be interpreted as signs of physical debility, while someone with high self-efficacy would view this as a sign that the exercise is working and the body is moving (Bandura).

Self-efficacy has been shown to be a powerful predictor of health behavior (Abusabha & Achterberg, 1997). Most intervention studies assessing self-efficacy indicate that increases in knowledge, training, experience, and/or familiarity with a task are likely to result in increases in self-efficacy scores for that task. An increase in self-efficacy, in turn, is likely to change and shape behavior toward accomplishing the task (Abusabha & Achterberg).

Several studies have examined the role of self-efficacy with regard to weight management. Results suggest self-efficacy increases over the course of obesity treatment (Clark, Abrams, Niaura, Eaton & Rossi, 1991; Clark, Cargill, Medeiros, & Pera, 1996; Glynn & Ruderman, 1986; Pinto, Clark, Cruess, Szymanski, & Pera, 1999; Prochaska, Norcross, Fowler, Follick, & Abrams, 1992). Self-efficacy has also been shown to predict subsequent weight loss (Dutton, Martin, Rhode, & Brantley, 2004).

Clark, et al. (1991), developed the Weight Efficacy Lifestyle Questionnaire (WEL), a measure of self-efficacy for controlling eating in specific circumstances. The majority of the initial 40 items on the Weight Efficacy Life-Style Questionnaire (WEL) were adapted from Condiotte and Lichtenstein's (1981) Smoking Confidence Questionnaire. Items were added and refined on the basis of clinical experience and

administration of the measure to a sample of obese patients (Clark, et al., 1991). Using the original 40 questions the WEL was administered to 162 obese patients who enrolled in a 14 session structured behavioral weight loss program at the workplace (Clark et al.). After a principal component analysis Clark, et al. revealed a five component solution by two different methods of determining the number of components to retain in the questionnaire and came up with a total of 20 questions, 4 in each subcategory – negative emotions, availability, social pressure, physical discomfort, and positive activities. This is the WEL survey used today. The five subcategories of Clark et al. survey equal the total self-efficacy in eating behaviors of a person.

Some positive uses of the WEL questionnaire include using an individual's score to access the client's readiness to change behavior and his or her strengths and weaknesses in coping repertoire (Clark, et al., 1991). In addition, once clients are involved in an intervention program, the separate scale scores could be used to monitor the effectiveness of the intervention and to help point out potentially troublesome situations that need to be targeted specifically in an effort to prevent relapse (Clark et al.).

In a study of self-efficacy and attrition in a weight reduction program, results of the analyses involving self-efficacy and weight loss indicated that there was a correlation between weight loss and changes in the level of personal efficacy (Bernier, 1986). The individuals (62 overweight women) were tracked at six weeks and six months to determine if there continued to be a correlation with weight loss and self-efficacy improvement. The participants had to be at least 15% over-weight, not have had a bypass operation, and were not taking any medication that might affect weight and not participating in another weight reduction program. The average age of the participants

was 43.5 years and the age range was 21 to 65 years with the average weight at the beginning of the treatment at 79.5 kg  $\pm$ 13.5. The average percent overweight was approximately 50.7%, ranging from 15-133% over ideal weight. The groups were split into five different classes that met once a week for 10 consecutive weeks with class sizes of 12 to 13 persons. There were two follow-up sessions; one six weeks after the end of classes, and the other 24 weeks after the end of classes. The participants received information on nutrition and exercise and also 10 cognitive-behavioral self-control strategies of Rodin (1978) as cited in Bernier (1986). These strategies include:

1. stopping and thinking before any eating episode
2. attempting to identify hunger and satiety cues
3. identifying and disputing dysfunctional thoughts associated with eating
4. identifying and preparing for "risk situations" associated with eating
5. setting short-term, flexible goals relating to eating behavior
6. emitting self-reinforcing statements
7. imagining and cognitively rehearsing alternate strategies in order to deal with risk situations
8. substituting alternate activities to eating
9. avoiding risk situations
10. delaying eating in risk situations

Questionnaire measures of self-efficacy were devised and evaluated at pretreatment and posttreatment. Consistent with Bandura's theory, subsequent subjects' self-efficacy expectations improved significantly over treatment (Bernier 1986).

In another study by Dutton et al. (2004), the Weight Efficacy Lifestyle Questionnaire (WELS) was used with African American women. In this study the researchers evaluated the WELS questionnaire's validity when the research measures ethnic minorities. This population (being female and African American) is particularly at risk for overweight and obesity (U.S. Department of Health and Human Services, 2001). According to Kumanyika (2002) as cited by Dutton et al., (2004) obesity treatments with African American individuals have shown less effectiveness than treatments with Caucasian participants. This study looked at a sample of 144 overweight and obese African American females. Analyses indicated similar self-efficacy levels compared to predominately Caucasian samples. Results from this study indicated that the WEL may be a valid measure of self-efficacy for overweight and obese African American women (Dutton et al.).

Self motivation compared with self-efficacy was also reviewed (Edell, Edington, Herd, O'Brien, & Witkin, 1986). Their studies found that increased self-efficacy, not self motivation was a predictor of more weight loss in an intensive weight control program. The subjects in this group were 52 males and 95 females that were at least fifty pounds overweight with a mean age of 43 years old. Data was collected that included a personal data questionnaire and the self-motivation inventory was used. The results show that self efficacy measured did correlate significantly with weight loss in this group (Edell et al., 1986).

Shannon, Bagby, Wang, and Trenkner (1990) looked at self-efficacy as a contributor to the explanation of eating behavior. In this study 170 women participated in a 10 week weight control course. Data was collected prior to the course (time one)

immediately after the 10 weeks (time two) and two months afterward (time three) (Shannon et al., 1990). In time two they had 120 participants and at time three they had retained 107 participants.

Shannon et al. (1990) conducted weight control courses within the context of social cognitive theory. This theory maintains that knowledge about a particular behavior is considered a personal factor that may play a role in whether the behavior is performed (Shannon & et al.). To improve the participant's skills in eating behaviors that would lead to weight loss part of each session focused on knowledge and skills needed to select and prepare low calorie, nutritious meals and snacks. Ways to reduce fat consumption, in particular, to reduce caloric intake were emphasized. To improve self-efficacy, the researchers introduced the participants to coping responses and taught skills for choosing nutritious diets that would promote weight loss. In addition, the researchers gave the participants opportunities to practice what they had learned and worked with them to set short term goals each week as well as opportunities to share successes and setbacks (Shannon et al). Results from this study indicated that self-efficacy may be an important factor to address in nutrition education programs designed to change eating behavior.

#### *Weight loss programs*

Current practice guidelines for management of overweight and obesity recommend a program of diet, exercise, and behavior therapy for all persons with a body mass index (BMI) of at least 30 and/or those with body mass index  $\geq 25$  plus two weight related comorbidities (Fabricatore, 2007). Traditionally, the goal of obesity treatment has been straightforward – reduce body weight to ideal, as defined by height weight charts (Foster, Wadden, Vogt, and Brewer, 1997).



The recommended starting point of treatment is a structured program of diet, exercise, and behavior therapy that is often referred to as lifestyle modification (Fabricatore, 2007). Historically, behavioral weight loss programs included weekly sessions of 60 to 90 minutes each for approximately six months and induced mean weight losses of approximately 10% of initial weight (Wing, 2002).

Many studies have been done looking at the effectiveness of weight loss programs (Buffenstein, Karklin, & Driver, 2000; Crawford, Jeffery, & French, 2000; Fitzgibbon, Stolley, & Kirschenbaum, 1993; Jeffery, Wing, & Mayer, 1998; Ramirez & Rosen, 2001; Schoeller & Buchholz, 2005). The studies have varied in participant sizes, ages, genders and classroom concentration.

Buffenstein, Karklin, and Driver (2000) researched nine healthy overweight women with a mean weight of  $71 \pm 8$  kg, BMI of  $26.1 \pm 2.8$  kg/m<sup>2</sup> and aged 20-36 years that participated in a six week program. This study researched the physiological and performance responses of these women to a month of restricted energy intake. Their results show that the very low-energy diet appeared to be neither physiologically nor psychologically stressful (Buffenstein, Karklin, & Driver, 2000).

Crawford, Jeffery and French (2000) examined successful weight loss and successful weight maintenance over three years in a community based sample of 854 subjects aged 20 to 45 years at baseline. Of the 854 participants, there were 173 and 431, men and women, respectively, with high income and 250 women with low income. Their BMI was  $27.7 \pm 4.7$  for the men,  $25.7 \pm 4.8$  for the higher income women and  $28.0 \pm 7.1$  for the women with lower income (Crawford et al, 2000.). There was no data available

for mean weights. In this study they found that few men or women were successful in either losing weight or avoiding weight gain over a three year period (Crawford et al.).

In a comparison study by Skender et al. (1996) the effects of three cognitive-behavioral weight control interventions for adults were compared; diet only, exercise only, and a combination of diet and exercise. The researchers looked at the follow-up data two years later of this group that consisted of 127 men and women that were at least 14 kg overweight (according to height-weight tables) and between the ages of 25 and 45 years of age (Skender et al., 1996). According to Skender et al., there was no significant differences noted among the three groups but during the second year, the diet only group had regained their weight (.9 kg above baseline) and the combination group regained 2.2 kg below baseline and the exercise only group had regained slightly 2.7 kg below baseline. This study suggested that dieting is associated with weight loss followed by regain after treatment ends, whereas exercise alone produced smaller weight losses but better maintenance (Skender et al.).

In the research of Fitzgibbon, Stolley, and Kirschenbaum, (1993), the pool of participants consisted of 547 people; 203 obese people who had sought treatment in a professional, hospital based program, 116 obese people who had not sought treatment for their obesity and 228 nonobese people (Fitzgibbon et al., 1993). The ages of the groups differed significantly with the oldest group being the obese group that sought treatment with a mean age of  $42 \pm 12$  years. The non-obese group had the youngest ages with a mean age of  $33 \pm 9$ . The groups varied significantly in their percentage overweight with the obese group seeking treatment ( $M=63\%$ ,  $SD=54\%$ ), the obese group not seeking treatment ( $M=46\%$ ,  $SD=23\%$ ) and the normal group was not overweight  $M=.008\%$ ,

SD=.13%, (Fitzgibbon et al.). According to Fitzgibbon et al. both obese groups evidenced more symptoms of distress, negative emotional eating, overeating, difficulty resisting temptation and less exercise than did normal weight controls.

Unfortunately, obesity is a disorder that is extremely difficult to treat (Kalodner & Delucia, 1990; Skender, et al., 1996). Kalodner and Delucia (1990) reviewed the four major components of importance in weight control programs: behavior modification, cognitive therapy, social support, and nutrition education. Each of these are discussed below.

Behavior therapy is the most common component used in weight loss programs (Brownell & Kramer 1989). The goal of behavioral interventions is modification of daily eating behaviors to produce lasting change (Kalodner & Delucia, 1990). Stunkard (cited in Kalodner & Delucia, 1990) explained “obesity is so largely a result of the way we live, our lifestyles and personal habits, controlling obesity may well require major changes in lifestyles and personal habits, rather than temporary dieting” (p. 213).

There appear to be three major types of behavior change strategies incorporated into weight loss programs: stimulus control procedures that are aimed at changing the antecedents of eating; the modification of eating behaviors is designed to affect the act of eating directly; and contingency management attends to consequences of eating (Kalodner & Delucia, 1990).

Stimulus control involves modified environmental cues so that undesirable responses (inappropriate eating) will decrease in frequency and desirable responses (appropriate eating) will be more likely to occur (Kalodner & Delucia, 1990). This happens in two ways, first the environment is restructured to decrease the number of cues

to eat and second, the individual is encouraged to reduce the effect of cues by refusing to respond by eating (Bellack, 1975). Techniques include eliminating visual food cues, narrowing the range of cues associated with eating, minimizing contact with food, introducing cues to eat less, and preplanning meals and snacks are all examples of stimulus control techniques (Kalodner & Delucia, 1990).

Craighead et al., 1981 (cited by Kalodner & Delucia, 1990) reported that behavioral techniques encourage modification of eating behaviors by helping participants develop a controlled eating style. Participants are encouraged to eat regularly scheduled meals and to slow the pace of eating (Kalodner & Delucia, 1990).

Craighead et al., 1981 (cited by Kalodner & Delucia, 1990) stated that contingency management procedures are designed to provide positive consequences for appropriate eating behaviors to increase the probability of future occurrences. Self-monitoring is a central component in weight loss programs; it is used as a data collection procedure that provides useful information about antecedents and consequences of eating, caloric and energy levels, and patterns in eating behavior (Ferguson, 1975).

The second component of weight loss programs includes cognitive intervention. Cognitive strategies are designed to teach participants about the relationship between thoughts and behavior (Kalodner & Delucia, 1990). Participants are taught to identify maladaptive thought, to produce more adaptive self-statements, and to replace maladaptive thoughts with more adaptive ones (Bennett, 1986; Collins, Rothblum, & Wilson, 1986). Mahoney & Mahoney (1976) as cited by Kalodner & Delucia, 1990 stated that a cognitive component should begin with three simple ideas; first it is necessary to explain that people continually have thoughts. Second, the content of

thoughts influences behavior and feelings and, third, people can learn to control thoughts and feelings.

The third component in weight loss programs is social support. The importance of involving family and friends in weight efforts has been noted (Brownell, 1984; Brownell & Jeffery, 1987). Self-help groups such as Weight Watchers, Take Off Pounds Sensibly (TOPS), Overeaters Anonymous (OA), and interventions conducted within the workplace, use “similar peers” as one type of social support interventions (Kalodner & Delucia, 1990).

Another type of intervention to mobilize support systems works on the premise that people give and receive support in their natural environment and that they can use family members and friends as support and also role models (Kalodner & Delucia, 1990).

The fourth component in weight loss programs is nutrition education. Kalodner & Delucia, (1990) cited Brownell & Wadden, (1986), in that nutrition education is an important aspect of comprehensive weight loss programs. Nutrition education teaches the skills necessary to interpret information (i.e., food labels) to make informed decisions about the nutritional content of food and to promote the development and maintenance of positive attitudes toward eating nutritious foods and the behavior of eating a nutritionally balanced diet (Johnson & Johnson, 1985).

In a study by Davis, Hodges, and Gillham, (2006) the importance of fruit and vegetable consumption was clearly displayed. In this study, they found that overweight/obese subjects consumed more total fat, saturated fat, and cholesterol and less carbohydrate, complex carbohydrate, and dietary fiber than the control subjects that were normal weighted (and of same age and height). Reported intake of dietary fiber was

inversely related to percent body fat without ( $R^2=0.052$ ,  $P=0.02$ ) and with ( $R^2=0.045$ ,  $P=0.013$ ) control for potential confounding factors. Servings of fruit per day were negatively related to percent body fat ( $r=-0.40$ ,  $P<0.01$ ) (Davis, Hodges, & Gillham, 2006). These findings suggest that the composition of a diet, especially a low dietary fiber and fruit intake, plays a role in the etiology of obesity (Davis et al., 2006).

Research done by Mattfeldt-Beman et al. (1999) was done to evaluate participants' perceptions of the weight-loss intervention used in a hypertension prevention clinical trial. There were 308 overweight and moderately obese subjects who participated in the weight-management intervention. After the 18 month program, 281 participants completed a questionnaire designed to evaluate their perceptions of the program's effectiveness (Mattfeldt-Beman et al.). The evaluations study suggested that the weight loss programs participants wanted the classes to find flexible and creative ways to maintain contact with participants, continue to develop better methods of self-monitoring, obtain the skills needed to recognize frustration and provide timely support, continue to couple the message of diet and exercise, and emphasize helping participants develop their problem solving skills (Mattfeldt-Beman et al.).

### Chapter III: Methodology

The objective of this quantitative research was to determine if self-efficacy was correlated to weight loss in participants enrolled in Health Switch.

A discussion on subject selection and description, the instrumentation used, nutrition education classes, data collection procedures, data analysis, and limitations will be reviewed in this chapter. The Institutional Review Board (IRB) approval for the study is included in the Appendix A.

#### *Subject Selection and Description*

The participants in this study were employees from Red Cedar Medical Center who had the opportunity to join Health Switch, an eight-week healthy nutrition program offered through their Red Cedar Medical Center. Health Switch will be described in more detail later in the methodology chapter. The class was also open to spouses and friends of employees of the facility. The experimental group included all subjects that had enrolled in Health Switch and were willing to participate in the surveys.

A control group was solicited from employees at Red Cedar Medical Center. The participants were asked if in the past three to six months they had considered joining a weight loss program and for some reason did not, but would be willing to participate in the same survey as the class participants. There were no restrictions on age, weight, or gender. The control group did not participate in Health Switch or any other weight loss program. The control group completed surveys on week zero, week four, and week eight. These surveys were sent to the instructor via e-mail. They also recorded their weights on the surveys.

### *Instrumentation*

The survey used in this study was the Weight Loss Self-Efficacy Survey (WELS) (Appendix B) that the researcher identified in several peer reviewed articles. This survey was designed specifically to evaluate a person's self efficacy surrounding eating in different settings and different emotions. The survey questions developed for the survey were categorized as follows: four questions on eating behaviors and negative emotions, four questions on eating behaviors and availability of food, four questions on eating behaviors and social pressures, four questions on eating behaviors and physical discomfort, and three questions on eating behaviors and positive activities. The questions belonging to each subcategory can be found in Appendix C. The survey volunteers answered written questions using a scale of 1-10 with 1 being not confident and 10 being very confident.

The participants in the class were almost exclusively women with the exception of one male. The control group had only women volunteer to do the surveys. Because there was only one male in the study and no males in the control group, the investigator did not include the one male's survey data in the analysis.

Weight for the participants in the experimental group was done prior to each class period, the same undergraduate student from UW-Stout weighed each participant on the same scale that was provided by Red Cedar Medical Center and the undergraduate student recorded the weights in their folders. On week one, ages and heights were also requested and the participants volunteered the information. The control group supplied their ages and heights as well on their surveys they e-mailed to the investigator on week zero.



### *Health Switch-Nutrition Education Classes*

The nutrition education classes (Health Switch) were held once each week for eight weeks beginning in the fall of 2006. The class periods were one hour in length. The eight-week outline was designed to target skills and knowledge that would help participants improve self-efficacy issues that were addressed in the WELS survey.

The major theme of the class was to teach the experimental group participants to make healthier choices through minor changes and to learn more about foods that could increase energy levels and promote health. Emphasis was placed on moving away from dieting and making conscious choices to change the way they eat each day.

Classes focused on making mindful changes in their eating that could help reduce caloric intake by as much as 100 to 200 calories depending on the changes they made. These ideas and tips were taken from a book called *Mindless Eating, Why We Eat more than We Think* by Brian Wansink Ph.D. (Wansink, 2006). The author helped readers determine what type of eater they were and based on this type he supplied hints to help move from mindless eating to mindful eating. Handouts prepared for the class were taken directly from the book and more information on mindful eating can be found in the book that is cited in the reference list.

Also one healthy habit from the book *Water with Lemon* by Zonya Foco, R.D (Foco & Moss, 2006) was discussed each week. The principles behind these healthy habits were to make changes in eating patterns to the capacity that the participant was comfortable. By incorporating all of these habits the participants could move towards good health and if part of becoming healthy was losing weight then it will occur naturally without dieting. The eight habits discussed were:

- 1). Drink water and think before you drink anything else
- 2). Include breakfast and stop eating two or three hours before bed
- 3). Eat often and include a fruit or vegetable each time
- 4). Tame your sweet tooth and eat as little sugar as possible
- 5). Find the fat and know the good, the bad and the ugly
- 6). Replace processed, chemically enhanced foods for wholesome close-to-the-farm foods, and as much as possible, avoid products that list food colorings, chemical flavor enhancers and preservatives you can't pronounce.
- 7). Eat only until you are no longer hungry, and stop swallowing the lead filled beach ball.
- 8). Every once in a while, when the urge or circumstance dictates, it's all right to eat outside the guidelines of the other habits, and understand this habit is just as important as the other seven (Foco, 2006). Further detail of these habits can be found in the book that is cited in the reference list.

Each week super foods were introduced to the experimental group's class along with a food sample and recipes that supported the super foods of the week. These super foods presented were from the book titled *Super foods Rx: Fourteen Foods That Will Change Your Life* by Steven Pratt M.D., (Pratt & Matthews, 2005). These foods contain phytonutrients that are known to decrease incidences of heart disease, diabetes and cancers to name just a few diseases. The 14 foods offered multiple health benefits along with compelling research as to reasons to include them in your diet. The 14 foods discussed were: beans, blueberries, broccoli, oats, oranges, pumpkin, wild salmon, soy, spinach, tea, tomatoes, turkey, and walnuts. Each handout prepared for the class included

information on why the food was considered a super food, foods that were part of this super group family and should also be eaten in addition to the food presented, how much should be consumed each day or week and information on the role of the food in the body. Each handout also contained recipes that could be tried in order to incorporate that super food into their diet. Further information on these super foods can be found in the book that is cited in the reference list.

Each week an exercise component was addressed in the class and a small presentation of recommended exercises was presented. Increasing activity levels by including the new exercises the following week was encouraged.

Goal setting around exercise, fruit and vegetable intake and increased water intake was discussed each week and participants shared goals with both table members and the class. In addition, the class was encouraged to consider obstacles that could get in the way of reaching their goals and how they could overcome these individual obstacles.

Priorities in class discussion included teaching portion sizes and emphasizing mindfulness while eating. There was also a friendly team competition to inspire camaraderie among the members and to encourage weight loss. Participants selected their teams and also gave their team a name. Each week the percentage of weight loss from the team's total weight was calculated and recorded and at the end of eight weeks the winning team received prizes. All participants in the competition also received a small gift for taking part in the challenge.

In addition to presentations each week by the investigator, this eight-week weight loss class provided undergraduate students in the dietetics program at the University of

Wisconsin-Stout an opportunity to earn field experience hours through research, preparation, and presenting on various nutrition topics.

As with many nutrition education programs, various learning models were used during the eight-week session. The following learning models were incorporated into Health Switch: The Social Learning Theory, The Knowledge-Attitude-Behavior Model (KAB model), The Social Cognitive Theory, and the Behavioral Learning Theory.

The Social Learning Theory involved having the participants observe through role models. Class period time each week was dedicated to sharing successes that other members had in setting and meeting goals and other strategies they were using to meet weight loss goals. Presenters and the investigator shared examples of healthy eating and exercise routines so that the participants could see examples of healthy eating and exercise.

When using the KAB model of learning the investigator presented new information to the participants in order to increase their knowledge with the hope that it would lead to changes in their future behaviors in regards to weight loss, healthy eating and exercise. This weight loss class provided the group with different information on a wide range of topics that would help them achieve their goals. Examples include correct portion sizes, healthy eating, reading food labels, and exercise. The information that was given to the group was realistic and wasn't outside their capability which helped to motivate the participants because it represented something they could do as well as an attainable goal.

The Social Cognitive theory was used in many ways during this program. The goal of the participants was to adapt a healthy lifestyle with the benefit of weight loss.

The first day of class participants were asked why they enrolled in the weight management class and to identify their goals. Goal setting is one aspect of this theory and although the goals identified by each individual were vague, they had their own unique reasons for attending the program.

The Social Cognitive theory also implies mental activities, prior knowledge and repetition to reinforce behavior. Many of the activities in the eight weeks used prior knowledge to apply concepts of healthy eating through food demonstrations, displays, and discussion. Repetition on key points, such as introducing portion sizes for one class, was reinforced during many other sessions and incorporated into other lessons. Weeks that talked about eating out reinforced portion sizes and ways to cut calories or better choices while dining out also emphasized portion control.

Active involvement as part of the Social Cognitive theory reinforces behavior changes. For example, participants were actively involved in discussion on a weekly basis to ask questions, give opinions and discuss with others what they have been experiencing and found success in changing behaviors.

Behavioral learning theory was used by primarily positive reinforcers and shaping. Each week discussion in class included what was working. The facilitator and presenters were cheerleaders for the group who encouraged participants to make the changes they wanted. The weekly weigh-ins were also a positive reinforcer when the participant lost weight. The weigh-ins could also at times be considered a negative reinforcer for some of the participants when they did not lose weight and knew they were not following the program. An e-mail was sent out to the group with a motivational message of encouragement and shaping in the middle of each week. The e-mails always

closed with “move your bodies- eat clean and healthy” (See Appendix D). The e-mails were also an attempt to help shape the participants thoughts and action during mid-week when people aren't always necessarily thinking about their weight loss goals. In addition to the weekly e-mails, the facilitator also had extensive one-on-one conversations with the participants to answer questions and help encourage progress – this was done informally after class or through e-mails. Feedback from the participants throughout the program indicated that this was one of the most important things the facilitator did for the group.

A variety of learning styles were used during the eight week session that appealed to many different types of learners. Discussion was used in explaining concepts and how information on the handouts could be used in daily life or as a reference tool. These handouts were also visuals. To drive the point home even further, tactile methods were also used. For example, when talking about portion sizes the participants were given handouts, discussion on how common household objects could be used for comparing accurate portion sizes (domino for serving of cheese, deck of cards for serving of meat, tennis ball for serving size of fruit, etc.) and hands-on demonstrations to apply what they have learned were conducted. The hands-on demonstrations regarding portion sizes indicated what they normally ate for a portion size compared to what they could be considering a more appropriate portion size. The three learning styles combined helped participants absorb the knowledge by appealing to their different learning styles.

During the 8 week time frame the control group only communicated to the investigator by sending surveys (WELS) during the appropriate time frames of week

zero, week four, and week eight. The investigator only communicated with the control group via e-mail, and only at survey collection times.

Table 1 gives a brief description of the curriculum presented to the experimental group participating in Health Switch.

Table 1

---

Outline of Topics Introduced

---

Week 1 curriculum:

Weigh in, introductions, super food, healthy eating habit one, mini portion size discussion, nutrition tracker forms, competition rules, exercise component and expectations, goal setting

Week 2 curriculum:

Weigh in, mindless margin, super food, healthy eating habit two, goal setting, exercise, portion size and macro nutrient stations, goal setting

Week 3 curriculum:

Weigh in, goal setting, super food, healthy eating habit three, tips and conversion table, exercise, emotional eating, meal planning, label reading, goal setting

Week 4 curriculum:

Weigh in, healthy beverage guidelines, super foods, healthy eating habit four, whole grains, fruit and vegetables, exercise, goal setting

Week 5 curriculum:

Weigh in, typical holiday meal day worksheet, super foods, healthy eating habit five, vitamin and minerals, fats, exercise, goal setting

Week 6 curriculum:

Weigh in, super food, healthy eating habit six, recipe substitutions, bringing more joy into the holidays, better choices in restaurants, calcium, exercise, goal setting

Week 7 curriculum:

Weigh in, super food, healthy eating habit seven, holiday and buffet eating, super food buffet, drinking during the holidays, exercise, goal setting, and competition winners

Week 8 curriculum:

Weigh in, super food, healthy eating habit eight, reliable sources, low calorie high density foods, maintenance, soda and sugar, wrap up

---



Details of each week of class as follows:

Week one of classes began with introductions of the undergraduates and the investigator. Each participant introduced themselves and discussed what they hoped to learn from the classes. Before class started one of the undergraduates from UW-Stout took participants to record their weight on the scale-- Health-o-Meter Model 2101 KL-- supplied by Red Cedar Medical Center. Participants supplied their height and age and measurements and BMI's were calculated by two other undergraduate students. The BMI's were calculated only as a tool for the experimental group participants to use as another measurement of overweight and obesity. The Mifflin St. Jeor calculation for basal metabolic rate calculations (Basal metabolic rate multiplied by an activity factor of 1.1 to 1.3 and then 500 calorie deficit) was used to estimate caloric needs. Waist hip ratios and Tricep skinfolds calculations were also available to the experimental group participants if they wanted them.

A nutrition tracker (Appendix E) was provided for the participants to record calories consumed each day. This form was created by the investigator to replace food journals. The investigator found when conducting prior classes that participants often found food journals to be too time consuming and they often stopped using the food journals after just a few weeks. These forms included the appropriate protein portions, vegetable, fruit, dairy, fat, and grain portions and the person checked off the portions consumed. When the form was full, they knew they had eaten the appropriate calories for the day. The class was informed they could also use food diaries if they wished – either approach to tracking caloric intake was appropriate. A mini presentation on portion sizes the first evening helped them learn to use the nutrition trackers. Also a hand out

illustrating portion size for each food group was provided. The first super food -- beans was introduced. A bean recipe was prepared for the participants to taste and evaluate. A variety of recipes that incorporated beans were also included in the handout materials for week one.

Guidelines for the class were also discussed during week one – the emphasis for participants was to set goals around water, fruit and vegetable consumption and also exercise. Each week they received a Goal setting sheet (APPENDIX F) that stated: This week I will set a goal to: and it listed exercise, water, and fruit and vegetables. There were also two questions to answer each week: 1). What things could keep you from reaching your goals this week? 2). What do you have to do in order to make sure your goals happen? This helped participants to look ahead at barriers and to do some pre-planning to have a successful week.

During the eight weeks of the class participants were also advised to avoid alcohol, sugared pops, and sweetened fruit drinks if at all possible. Diet pop was acceptable, as well as tea and coffee-- but water was recommended as the primary fluid intake when possible.

During week one, the class divided into five different teams and each team selected a name. The team names included: Skinny Dippers, Lose to Win, Ain't No Chubby Fat Girlz, Fantastic 4, and Now You See Us, Now You Don't. The rules of the competition were explained. Each team member's weight would be added together and each week the percentage of weight loss or gain for the team would be calculated. The team with the highest percentage of weight loss on week seven would be the winning team.

The handouts for physical activity included materials on physical activity and calories burned per minute based on a participant's weight and activity level (Appendix G). This was explained in detail so that the experimental group participants would be able to keep an approximate tracking of exercise calorie expenditure each day. A handout called "Get moving for the health and fun of it" – went into detail about the benefits of physical activity, provided some new exercises to try and gave recommendations for incorporating exercise into a daily routine.

Week two's class included reviewing the goal planning around exercise, fruit and vegetables, and water consumption from the previous week. Sharing things that worked well, goals that were met and obstacles encountered were encouraged. Sharing struggles and successes helped participants get around obstacles and learn different ways to approach their problems.

The second super food, blueberries was introduced and a handout provided recipes and the benefits of consuming blueberries and other berries on a daily basis. A blueberry recipe was prepared for the class so that they could taste and evaluate a lower calorie dish that was also healthful.

Mindful eating was discussed in week two and the facilitator introduced the concept of food trade offs and food policies. In food trade offs the person can state "I can eat X if I do Y. Food policies are personal rules that you have about food. People can personalize policies to fit their situation. An example is stating: "I will never eat standing up." These concepts were based on the philosophy of Brian Wansink from the book,

*Mindless Eating.*

Also an in-depth discussion on mindful eating helped determine what kind of eater they were and they were given suggestions to help them place strategies in their life that would help them be more mindful and less mindless when eating.

Cardio exercise was introduced in this class and options for different facilities and activities for exercise available in the Menomonie Wisconsin area were discussed.

The second half of the class was an in-depth interactive portion size instruction session. Both “eye-balling” portion sizes and also basic calorie counts of foods were also discussed. Stations were set up around the room on macronutrients (carbohydrates, protein, and fats) and examples of foods from each food group along with important vitamins and minerals of that food were reviewed.

The sweets and fats station had vials of sugar and fat contents of some favorite foods for participants to view. A portion of potato chips versus a portion of air popped popcorn was available for visual comparison of the fat content. A standard portion-sized cookie and muffin were also available to compare to the oversized muffins and cookies more commonly found in restaurants and grocery stores. The caloric content of these foods was illustrated as well at this station.

The dairy stations included yogurts, cheese samples (1 oz cubed, 1 oz shredded, and 1 oz sliced) and lower fat milk products. Soy milk was available and prizes of low fat yogurts were given for answering dairy questions correctly. The caloric content of these foods was also available for review at this station.

The carbohydrate station included portion samples of fruit, vegetables and whole grains. A plate of pasta spaghetti was available and participants were encouraged to put

one serving of pasta into a plate – they were then shown the actual portion to compare to their selected portion size. Handouts at this station demonstrated the portion distortion that has occurred over the years with foods like French fries, muffins, and bagels. The caloric content of these foods was also available.

The protein station included samples of recipes incorporating leaner, healthier choices of meats and also food models of the portion sizes of meats along with the caloric content.

We also had a liquid station. This station displayed glasses and participants guessed the correct ounces of various glass sizes. This station was set up to help the participants understand the importance of including liquid calories in calorie counting. Studies have shown that people often consume high caloric drinks but don't include the calories when calculating daily caloric intake (Bell-Wilson, 2006). The caloric content of liquids, including popular coffee drinks was also available.

During week three, the goal planning for week two was reviewed and some time in class was used to discuss the goals that were met and obstacles ahead for the new week. New goals were set and the class was encouraged to share their goals.

The presentation also covered two more super foods, broccoli and oats. Handouts on the foods within these families showed the importance of incorporating these foods into the daily diet. There were also sample recipes that included broccoli and oats. A sample recipe of a broccoli salad was brought in for the class to taste and evaluate.

The exercise component for week three was weight training for the arms. One of the presenters demonstrated some easy arm exercises that could be done at home or the

gym. A handout of arm exercises was also included in the weekly packets for reference to the exercises discussed in class.

Undergraduate student presentations on week three included the following presentations: emotional eating, meal planning, eating on the run and label reading. Each presenter included a handout in the weekly packet for the participants to review and for future reference.

During week four the mid survey was administered and collected. The presentations for week four included two more super foods-- oranges and pumpkins. Handouts on the super foods included information on why they were considered a super food and various recipes that incorporated oranges and pumpkins. A sample pumpkin recipe was prepared and brought in for the participants to taste and evaluate.

A handout was presented to the class that discussed the new proposed healthy beverage guidelines as participants were questioning how much water, coffee, or tea they should consume each day. This article was found by the researcher in an article from *Today's Dietitian* (Bell-Wilson, 2006). Additional handouts for their review that week included a handout about making better choices at fast food restaurants and an article on oranges and why they are winter's favorite fresh fruit. Some holiday recipes with lower calorie contents were also distributed to the class as the winter holidays were approaching. These recipes allowed access to lower calorie versions of favorite recipes.

The exercise piece for week four was on the lower back and gluts. A demonstration of easy exercises that could be done at home without equipment was presented.

The undergraduate students presented information about whole grains, fruit and vegetables. Handouts related to presentations were supplied to the class for reference. A fun fruit quiz was presented and the participants were encouraged to determine the answers based on super foods we had discussed (Appendix H).

During week five goal-setting involved fruit and vegetables, exercise and water and because it was the week before Thanksgiving, goals around making Thanksgiving day healthier but still enjoyable were encouraged. A white board was used to record and brain storm ideas that the participants could do to keep the holiday healthier. They then chose three items from the list and set goals on how they would incorporate them into the holiday. A typical holiday meal day sheet was presented to the class so that they could see what an average Thanksgiving day caloric intake might look like. This tool was presented to educate on calorie content of holiday foods that are often heavier and sweeter than regular food.

Week five's presentation for super foods was wild salmon and soy. The handout included foods in this family and the reasons they were both considered a super food. Recipes using both of these foods were distributed to the class as well. A sample of the wild salmon was prepared for the class to taste and evaluate.

The exercise piece for week five was a component on weight training for the legs. A small demonstration of some simple leg exercises was also shared. These exercises were easy and could be done at home without the aid of special equipment.

Undergraduate students presented topics that included a presentation on the different types of fats, vitamins, and minerals. Handouts were distributed to the class for future reference on the topics presented.

Class did not meet the week of Thanksgiving and as a result during week six discussion centered on the outcome of the holiday goals. Obstacles that prevented them from meeting their goals were discussed along with successes that were achieved. Brainstorming was done to set new goals for the Christmas holiday. Participants were encouraged and congratulated for weighing in the week after the holiday which typically consists of overeating and for the goals they achieved. Goals they didn't reach were considered a learning experience. After goal setting was done for the week, the two super foods-- spinach and tea were presented. A handout was distributed that discussed why each was a super food, with recipes to incorporate each into the diet were provided. A sample spinach dish was prepared and presented to the class to taste and evaluate.

The exercise education piece focused on stretching and included some simple stretching demonstrations. Participants were encouraged to look into stretching using Yoga, Pilates, and Tai Chi.

Handouts this week included topics on preparing them for the holidays and some recipes for speedy meals that can be prepared during the busy holiday season. A recipe substitution handout and ways to lower fat in recipes were also distributed. A handout with the caloric content of common foods used in baking (flour, sugar, oatmeal, etc.) was also distributed. An article on bringing less stress and more joy into the holidays was also distributed. Participants were asked to read the article.

Undergraduate student presentations for week six included making better choices in restaurants and when shopping along with a presentation on calcium. Handouts were distributed to the class for future reference on the topics discussed.



Week seven of classes was two weeks before the Christmas holidays so the class time was used to discuss holiday and buffet eating. Using the super food theme, a buffet was prepared for the class incorporating all the different super foods that the class had learned about along with an introduction to two more super foods – tomatoes and turkey. Tips on making better choices during the holidays were discussed and the participants prepared a list of ways that they could make better choices during the holidays. The exercise piece discussed during week eight was abdominals and a demonstration of some easy abdominal exercises was shared.

On our final week of classes the final two of the 14 super foods were presented (walnuts and yogurt) along with food samples. The exercise piece demonstrated and discussed included not only the back but also the shoulders. Additional topics were eating large – low calorie high density foods, finding good nutrition information on the internet, and sugar and non caloric sweeteners. In addition maintenance tips were discussed with the class to help prepare them for maintaining their weight loss.

Each week there were new recipes and food samples to try.

#### *Data Collection Procedures*

A 19-question survey was administered to the experimental group class participants on week one, four, and eight at the beginning of each class period (see Appendix B). During week one consent forms were passed out for review, signed, and collected (see Appendix I). Prior to each class period beginning, class participants were also weighed and their weight was recorded in their files. The class participants then filled out the surveys, which were collected before classes began. Each survey was assigned a number so that the participants' names did not have to be used. Their numbers

were assigned to their names and recorded by the investigator so that all surveys could be tied to the person participating for later data analysis.

The control group was contacted via e-mails. All participants willing to be part of the survey received a consent form and survey online. They were required to return their names on the surveys or in the body of an e-mail so that the researcher had their consent to use their surveys. They electronically sent their surveys to the researcher. The control group from Red Cedar Medical Center started four weeks after the class started, as it took longer to find volunteers for the control group. The control submitted their surveys on week one, week four, and week eight, as well as identifying their weight on the survey form with each survey submitted.

Table 2 shows the details of ages for the control and experimental groups. The experimental group contained a sample size of 21 but complete data was missing from one individual.

Table 2

---

Frequency Counts of Mean Age of Control and Experimental Groups

---

	Number	Mean	Median	Standard Deviation
Control	10	33.80	27.50	$\pm 10.727$
Experimental	21	45.20	45.50	$\pm 10.645$

---

### *Data Analysis*

A number of statistical analyses were used in this study. The Statistical Program for Social Sciences, version 14.0, (SPSS, 2006) was used to analyze the data. The surveys from the experimental group class and the control group were compared at weeks one, four, and eight. Data was analyzed using the two way analysis of variance with repeated measures over time to determine if self-efficacy improved with nutrition education over time in the experimental group.

### *Limitations*

One limitation of this procedure was the difficulty in getting a control group that tightly matched the volunteers from the study group. Also the experimental group participants were weighed by a third party administrator while the control group was allowed to communicate to the researcher their weights via e-mail. This could have resulted in inaccurate weights from the control group.

Another limitation of the study is that in the original survey the scale was 0 through 9, but in this survey the scale used was 1 to 10.

Another limitation of the study was one question from the subcategory positive activities was inadvertently omitted from the survey administered to the control and experimental group. The question was "*I can resist eating when I am happy.*"

## Chapter IV: Results

The purpose of this study was to determine if Health Switch, an eight week nutrition education class, could impact participant's self efficacy and if the results of increased self-efficacy would help in their weight loss efforts. From the WELS questionnaire the five subcategories of questions, availability of food, negative emotions, positive activities, social pressure and physical discomfort should show improvement.

The mean body weights at week zero, week four, and week eight analyzed by two way analysis of variance with repeated measures over time did show significance at the 95% confidence level. Table 3 indicates the comparison of both groups. Over time the experimental group lost significantly more weight than the control group.

Table 3

Mean Body Weights at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

	Sample size			Week 0	Week 4	Week 8
	Week: 0	4	8	lbs	lbs	lbs
Control	10	10	10	192±46 <sup>1</sup>	190±45	192±44
Experimental	20	13	13	196±47	195±47	190±47
Entire sample				194±46	192±45	191±44
Source of Variation				F Value	P Value	
Control/Experiment				.01	.908	
Test Time				2.77	.076	
Control/Experimental by time				3.50	.040 <sup>2</sup>	

<sup>1</sup>Means and Standard Deviation <sup>2</sup>Significance achieved at 95% confidence level

Figure 1 shows the mean change of body weights over time when comparing the control and experimental groups. Two way analysis of variance with repeated measures clearly shows a significant loss of weight ( $p \leq .05$ ) for the experimental group.

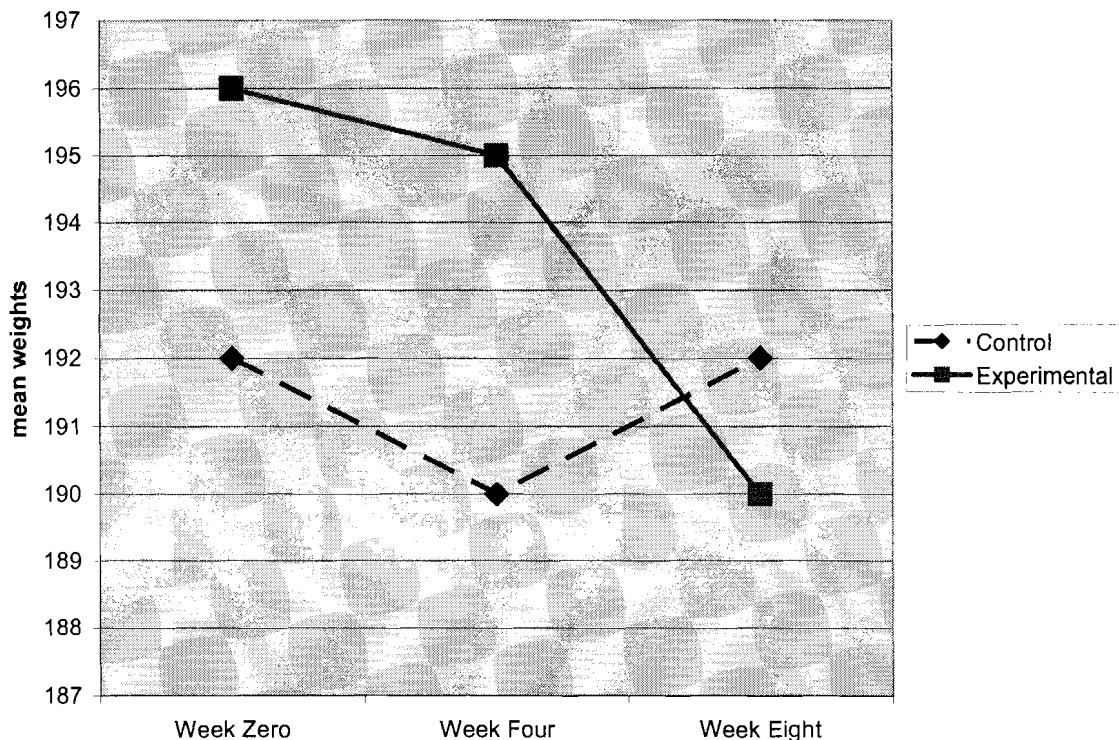


Figure 1. Change of weight over time. Two way analysis of variance with repeated measures control/experimental by test time  $p=0.04$

When looking at the subcategory of questions; negative emotions, physical discomfort, positive activities, social pressure, and availability using two way analysis of variance with repeated measures over time there was significance found in the subcategory of questions, positive activities  $p=.05$  between the experimental and control group over time. The subcategory physical discomfort  $p=.07$  indicates a trend towards significance in the experimental group versus control group. The balance of subcategories; negative emotions, availability, and social pressured did not show significance between the experimental and control group. In addition, there was

significant difference in all subcategories in test time in the two way analysis of variance with repeated measures over time. Tables 4, 5, 6, 7 and 8 show detail of two way measures of how time impacted each of the subcategories of questions. In both control and experimental groups over time, the self-efficacy as reflected by that category improved (Table 4, availability; Table 5, negative emotions; Table 6, Social pressure; Table 7, physical discomfort; and Table 8 positive activities). Figures 2, 3, 4, 5, and 6 demonstrate the control group means by category (availability, negative emotions, social pressure, physical discomfort, and positive activities, respectively) versus the experimental group.

Table 4

---

Mean Scores for Availability Category Questions<sup>2</sup> at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

---

	Week 0	Week 4	Week 8
Control	4.53±2.50 <sup>1</sup>	4.95±2.40	5.25±2.45
Experimental	4.72±2.03	5.53±1.31	6.78±1.10
Entire sample	4.61±2.24	5.21±1.96	5.93±2.07
Source of Variation	F Value	P Value	
Control/Experiment	.71	.413	
Test Time	8.47	.001	
Control/Experimental by time	2.06	.144	

---

<sup>1</sup>Means and Standard Deviation

Survey scores 1-10 (1 being not confident, 10 being very confident)

<sup>2</sup>Survey Questions pertaining to each subcategory found in Appendix C

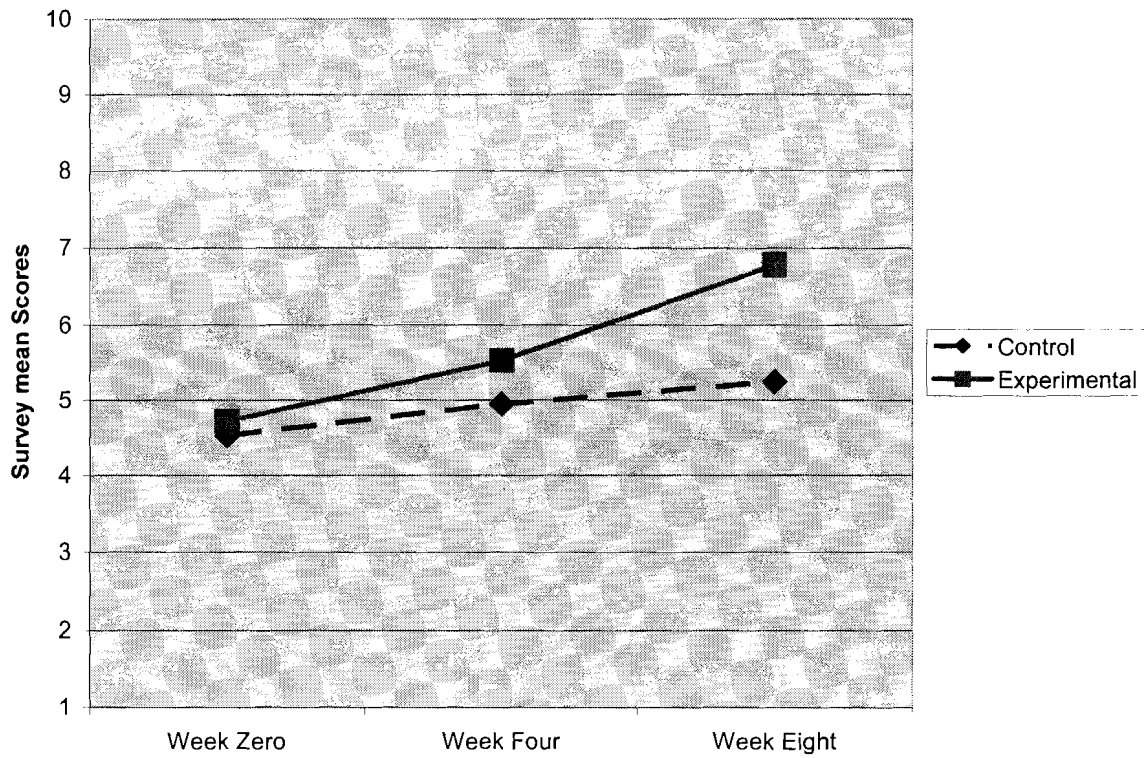


Figure 2. Mean scores for availability subcategory questions at week zero, week four, and week eight. Analyzed by two way analysis of variance with repeated measures. Survey scores 1-10 (1 being not confident, 10 being very confident).

Table 5

---

Mean Scores for Negative Emotions Category Questions<sup>2</sup> at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

---

	Week 0	Week 4	Week 8
Control	5.60±2.33 <sup>1</sup>	5.88±2.95	6.75±2.48
Experimental	4.25±2.24	5.31±1.53	6.84±1.21
Entire sample	5.00±2.33	5.63±2.38	6.79±1.96
Source of Variation	F Value	P Value	
Control/Experiment	.39	.542	
Test Time	12.31	.000	
Control/Experimental by time	1.79	.184	

---

<sup>1</sup>Means and Standard Deviation

Survey scores 1-10 (1 being not confident, 10 being very confident)

<sup>2</sup>Survey Questions pertaining to each subcategory found in Appendix C



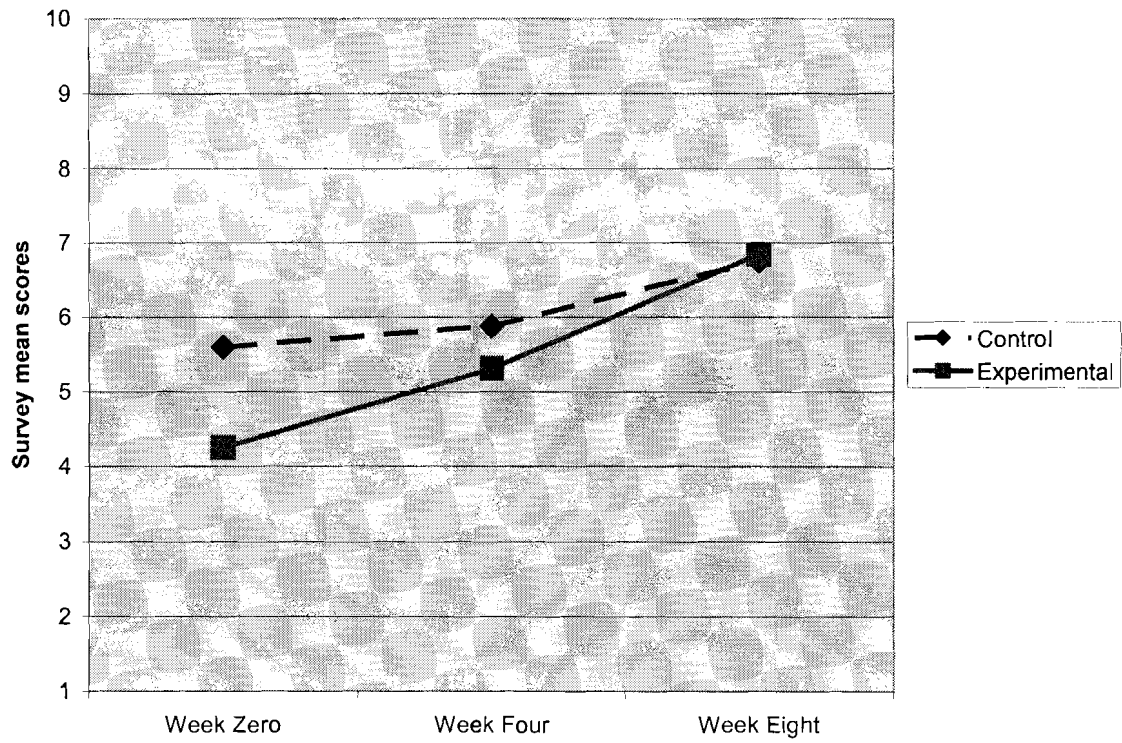


Figure 3. Mean scores for negative emotions subcategory questions at week zero, week four, and week eight. Analyzed by two way analysis of variance with repeated measures. Survey scores 1-10 (1 being not confident, 10 being very confident).

Table 6

---

Mean Scores for Social Pressure Category Questions<sup>2</sup> at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

---

	Week 0	Week 4	Week 8
Control	6.30±2.47 <sup>1</sup>	6.50±2.42	7.10±1.99
Experimental	5.72±2.05	6.69±1.20	7.81±.923
Entire sample	6.04±2.25	6.58±1.92	7.42±1.61
Source of Variation	F Value	P Value	
Control/Experiment	.02	.903	
Test Time	9.55	.001	
Control/Experimental by time	1.91	.165	

---

<sup>1</sup>Means and Standard Deviation

Survey scores 1-10 (1 being not confident, 10 being very confident)

<sup>2</sup>Survey Questions pertaining to each subcategory found in Appendix C

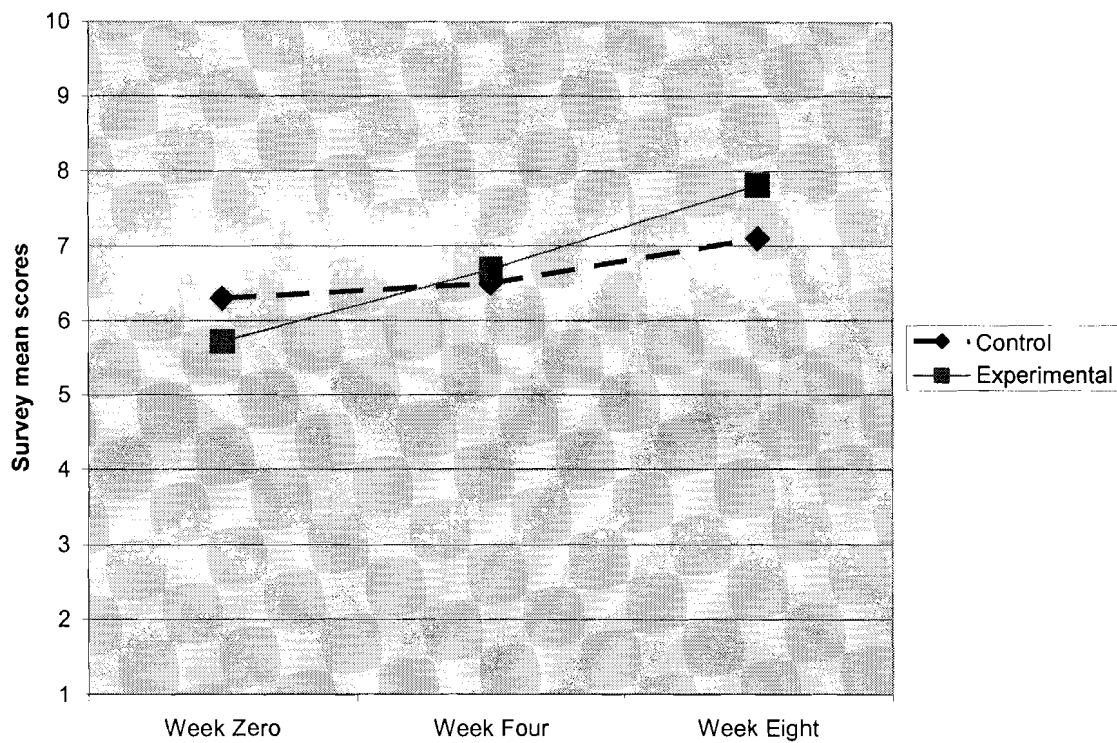


Figure 4. Mean scores for social pressure subcategory questions at week zero, week four, and week eight. Analyzed by two way analysis of variance with repeated measures. Survey scores 1-10 (1 being not confident, 10 being very confident).

Table 7

Mean Scores for Physical Discomfort Category Questions<sup>2</sup> at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

	Week 0	Week 4	Week 8
Control	7.65±1.96 <sup>1</sup>	7.65±2.51	8.08±1.49
Experimental	6.09±1.86	6.34±1.34	7.75±1.38
Entire sample	6.96±2.02	7.07±2.13	7.93±1.41
Source of Variation	F Value	P Value	
Control/Experiment	1.72	.208	
Test Time	8.76	.001	
Control/Experimental by time	2.87	.071	

<sup>1</sup>Means and Standard Deviation

Survey scores 1-10 (1 being not confident, 10 being very confident)

<sup>2</sup>Survey Questions pertaining to each subcategory found in Appendix C

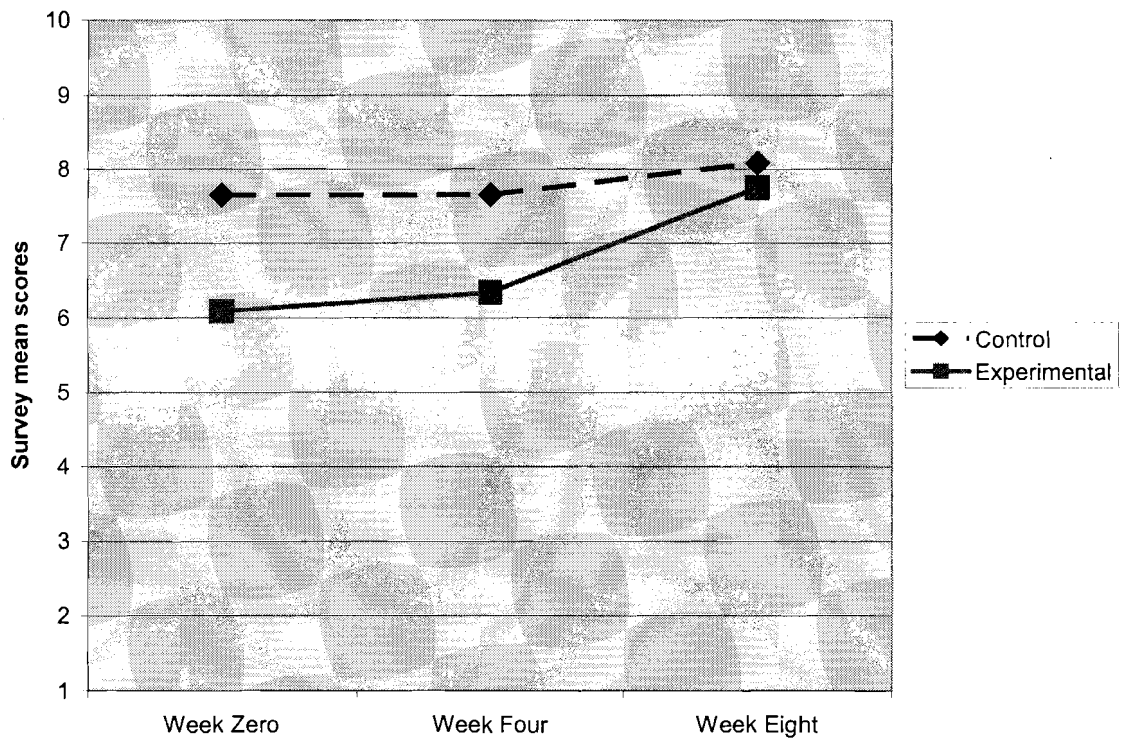


Figure 5. Mean scores for physical discomfort subcategory questions at week zero, week four, and week eight analyzed by two way analysis of variance with repeated measures. Survey scores 1-10 (1 being not confident, 10 being very confident).

Table 8

---

Mean Scores for Positive Activities Category Questions<sup>3</sup> at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

---

	Week 0	Week 4	Week 8
Control	6.77±2.03 <sup>1</sup>	6.50±2.34	7.00±2.07
Experimental	6.25±2.49	7.29±1.35	8.08±1.37
Entire sample	6.54±2.19	6.85±1.95	7.48±1.83
Source of Variation	F Value	P Value	
Control/Experiment	.27	.610	
Test Time	4.84	.015	
Control/Experimental by time	3.22	.050 <sup>2</sup>	

---

<sup>1</sup>Means and Standard Deviation <sup>2</sup>Significance achieved at 95% confidence level  
Survey scores 1-10 (1 being not confident, 10 being very confident)

<sup>3</sup>Survey Questions pertaining to each subcategory found in Appendix C

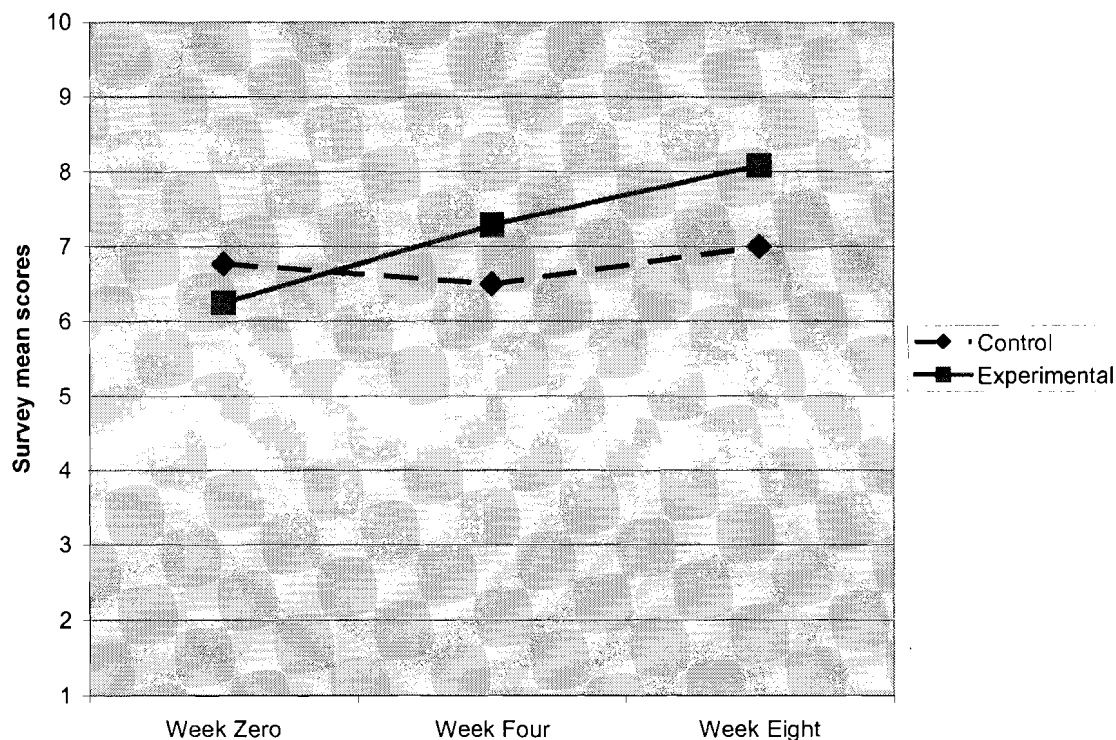


Figure 6. Mean scores for positive activities subcategory questions at week zero, week four, and week eight. Analyzed by two way analysis of variance with repeated measures. Survey scores 1-10 (1 being not confident, 10 being very confident).

When looking at the mean scores for individual questions using the two way analysis of variance with repeated measures over time, 3 questions showed significant difference between the control group and experimental group over time.

The first question was question number ten; *I can resist eating when I'm depressed or down* at ( $p=0.023$ ). Across time Table 9 shows the experimental group had a significantly higher score than did the control group. Both groups improved their score over time.

Table 9

Mean Scores for Question 10: *I can resist eating when I'm depressed or down*<sup>3</sup> at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

	Week 0	Week 4	Week 8
Control	5.20±2.62 <sup>1</sup>	5.70±2.87	6.20±2.94
Experimental	3.00±2.62	5.13±1.64	6.38±1.41
Entire sample	4.22±2.78	5.44±2.36	6.28±2.32
Source of Variation	F Value	P Value	
Control/Experiment	.65	.431	
Test Time	14.05	.000	
Control/Experimental by time	4.27	.023 <sup>2</sup>	

<sup>1</sup>Means and Standard Deviation <sup>2</sup>Significance achieved at 95% confidence level  
Survey scores 1-10 (1 being not confident, 10 being very confident)

<sup>3</sup>All survey questions are found in Appendix J

Figure 7 illustrates the significant changes for the experimental group over time for question 10, *I can resist eating when I'm depressed or down*. Note the graph also shows the significant improvement by time in both groups.



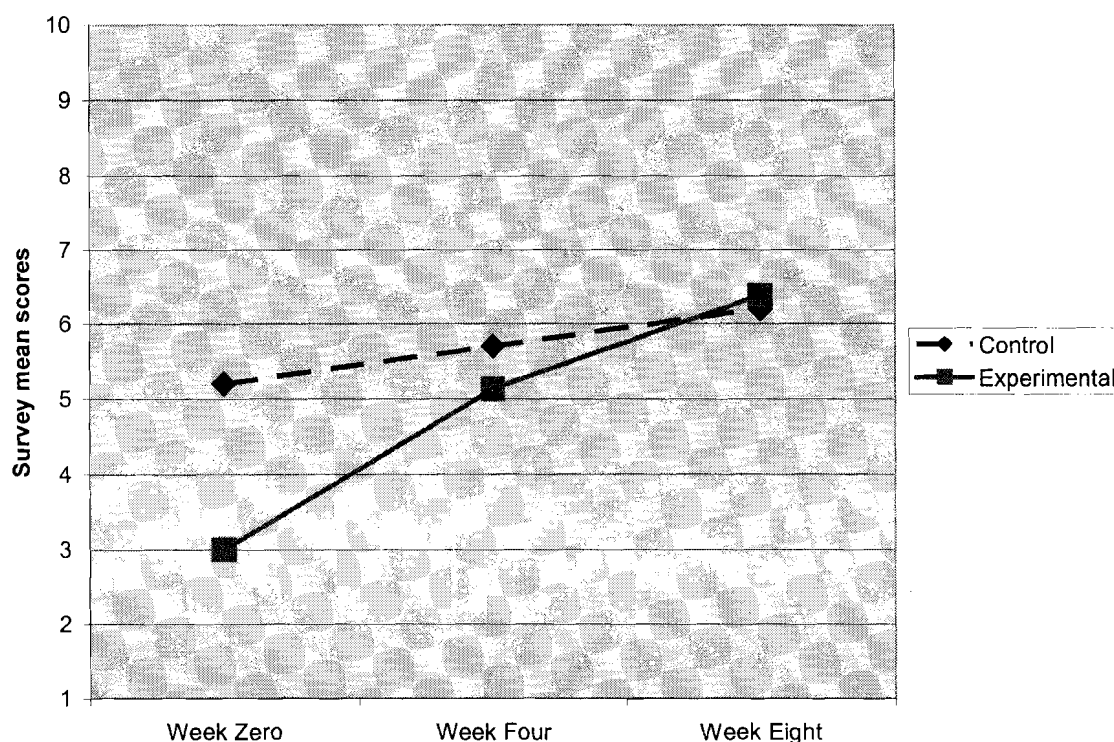


Figure 7. *I can resist eating even when I am depressed* means. Two way analysis of variance with repeated measures. Control/experimental by time  $p=0.023$ . Survey Scale 1-10 (1 being not confident, 10 being very confident).

Question number 16, *I can resist eating even when I am at a party* showed significant difference using the two way analysis of variance with repeated measures over time at  $p=.025$  when comparing the control and experimental group. The Experimental group exhibited significantly higher scores than the control group across time. In addition, there was significant differences in test time with ( $p=.002$ ). Both groups improved their score over time. Table 10 shows the detail of the analysis.

Table 10

Mean Scores for Question 16: *I Can Resist Eating Even When I am at a Party*<sup>3</sup> at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

	Week 0	Week 4	Week 8
Control	4.00±2.91 <sup>1</sup>	4.00±2.21	4.30±3.16
Experimental	4.63±1.77	5.38±1.41	6.88±1.46
Entire sample	4.28±2.42	4.61±1.98	5.44±2.81
Source of Variation	F Value	P Value	
Control/Experiment	2.18	.159	
Test Time	7.39	.002	
Control/Experimental by time	4.16	.025 <sup>2</sup>	

<sup>1</sup>Means and Standard Deviation <sup>2</sup>Significance achieved at 95% confidence level  
Survey scores 1-10 (1 being not confident, 10 being very confident)

<sup>3</sup>All survey questions are found in Appendix J

Figure 8 illustrates the dramatic and significantly greater changes in the experimental group compared to the control group on the question *I can resist eating even when I am at a party*. This graph is also depicting an increase in scores of both groups across time.

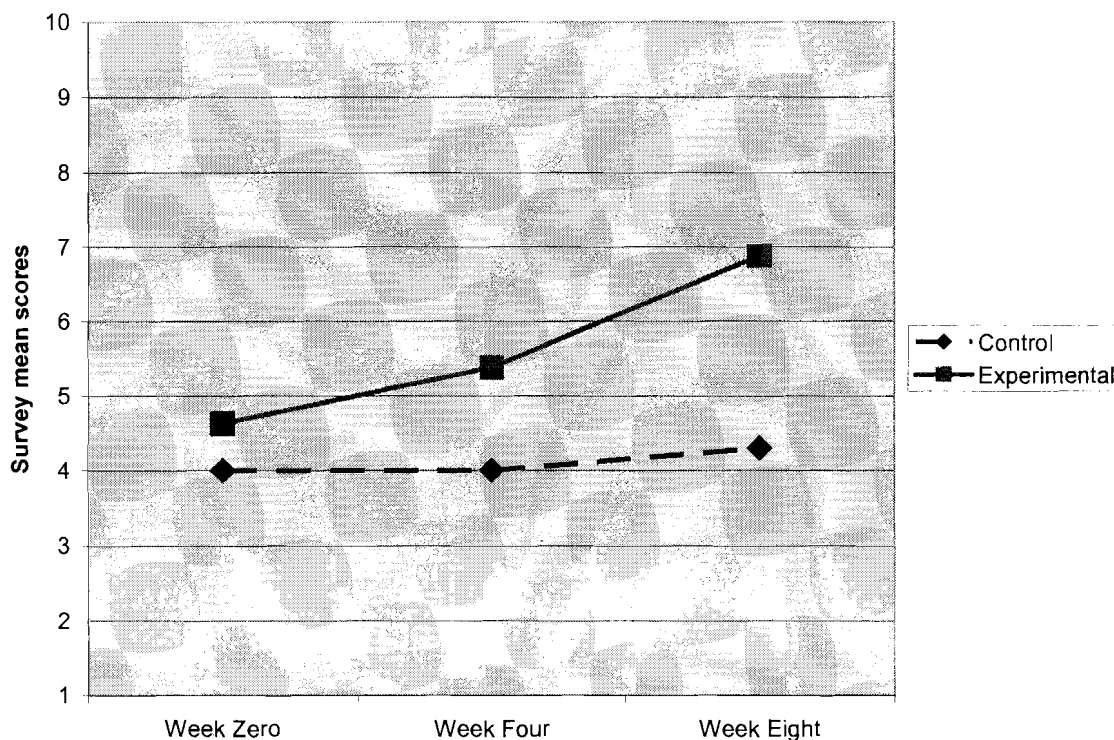


Figure 8. *I can resist eating even when I am at a party* means. Two way analysis of variance with repeated measures. Control/experimental by time  $p = 0.025$  Survey Scale 1-10 (1 being not confident, 10 being very confident).

Question nineteen, *I can resist eating just before going to bed* mean scores at week zero, week four and week eight analyzed by two way analysis of variance with repeated measures showed significant difference ( $p = .028$ ) when comparing the control and experimental groups. The experimental group had a significantly higher score on this question than did the control group when the two way analysis of variance with repeated measures analysis was utilized. In addition there was a significant difference ( $p = .028$ ) in test time at as well. Both groups improved their score on this question across time. Table 11 shows the results in detail.

Table 11

Mean Scores for Question 19: *I Can Resist Eating Just Before Going to Bed*<sup>3</sup> at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

	Week 0	Week 4	Week 8
Control	6.30±2.98 <sup>1</sup>	5.70±2.67	6.50±2.95
Experimental	5.56±3.21	7.56±1.51	8.33±1.66
Entire sample	5.95±3.03	6.58±2.34	7.37±2.54
Source of Variation	F Value	P Value	
Control/Experiment	.91	.353	
Test Time	3.96	.028	
Control/Experimental by time	3.99	.028 <sup>2</sup>	

<sup>1</sup>Means and Standard Deviation <sup>2</sup>Significance achieved at 95% confidence level  
Survey scores 1-10 (1 being not confident, 10 being very confident)

<sup>3</sup>All survey questions are found in Appendix J

Figure 9 illustrates the changes in self-efficacy over time for question nineteen *I can resist eating before going to bed*. This figure depicts the dramatic improvement in score of experimental group over control group as well as the improvement in the score of both groups across time.

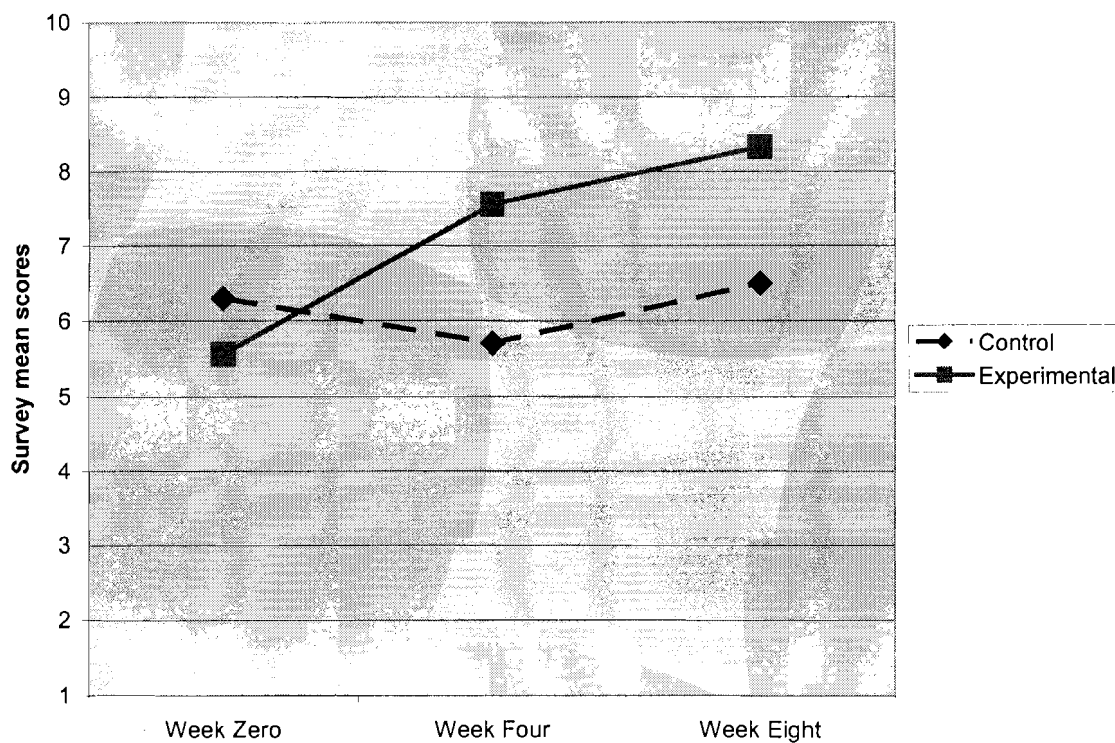


Figure 9. *I can resist eating just before going to bed.* Two way analysis of variance with repeated measures. Control/experimental by test time  $p= 0.028$   
Survey Scale 1-10 (1 being not confident, 10 being very confident).

The balance of the individual questions did not show significant difference when comparing control versus experimental by two way analysis of variance with repeated measures over time. Tables for questions one through 9, 11 through 15, and questions 17 and 18 can be found in Appendix K through Z.

During the last session Red Cedar Medical Center conducted a class evaluation. Table 12 shows the mean scores of this evaluation for each question addressed.

Table 12

---

 Health Switch – 8 Week Weight Loss Class Evaluation
 

---

Question	Average Score <sup>1,2</sup>
I've enjoyed this 8 week weight loss class	3.7
I liked the group setting	3.6
The weight loss competition helped me lose weight	3.2
I learned new information about weight loss	3.7
Cheri Rott presented her topic well	3.7
The handouts were helpful	3.6
My energy level has increased	3.1
I have incorporated exercise into my daily routine	2.7
I would join an 8 week weight loss class again	3.4
The location worked well for me	3.7
The time of the class worked well for me	3.6

---

<sup>1</sup>Based on ten surveys collected. <sup>2</sup>Evaluation scores 1 to 4; 4=strongly agree, 3=agree, 2=disagree, and 1=strongly disagree

## Chapter V: Discussion

### *Summary*

Over time, Health Switch was effective in promoting weight loss in the experimental group. There was a significant difference between the control and experimental group at the 95% confidence level. The mean weight of the control group stayed fairly consistent over the eight week period measured.

Over time, there was significance in the subcategory positive activities  $p=.05$  in the experimental group versus control group over time. The sub-category of questions in physical discomfort with  $p=.071$  indicates a trend towards significance in the experimental group. The other subcategory groups, negative emotions, physical discomfort and social pressure did not show significance.

There was also significance found in three separate questions when looking at the survey questions individually. The questions reflected items that were addressed specifically and continually through out Health Switch. These questions were; *I can resist eating even when I'm at a party* ( $p\leq.05$ ), *I can resist eating when I'm depressed or down* ( $p\leq.05$ ), and *I can resist eating just before going to bed* ( $p\leq.05$ ).

### *Limitations of the Study*

The primary limitations of this study were the small population sample and attendance during the weeks of survey collection. Health Switch was held over two holidays and participants had difficulty attending every class. Although there were 21 surveys in the experimental group at the beginning, by week four and week eight only 13 surveys were collected due to holiday activities that conflicted with attendance. Most of the research on weight loss programs included larger sample populations which would

then be separated into smaller, more manageable weight loss classes. In comparison, this study had a small population in both the experimental and control group.

The investigator also had difficulty obtaining a control group to participate in three separate surveys over an eight-week time frame which led to a small sample size. The sample size for the control group was ten.

### *Demographics*

All but one person in the control and experimental group were female, so the population studied was women after the investigator withdrew the male's data. The mean age of the control group was considerably younger than the experimental group (33.8 versus 45.2, respectively). However, mean weights of the two groups was more similar with mean weights of the control group at week zero, week four and week eight 192, 190, 192 lbs, respectively. The experimental group's mean weight started out a bit higher at 196 lbs, week four was 195 lbs, and week eight was 190 lbs. Thus, while the control group was fairly stagnant, the experimental group lost a mean average three percent of their body weight over the eight week class period.

The experimental group had approximately 22 participants but one set of data was incomplete for the first survey period, so 21 surveys were collected from the experimental group on week zero, 13 surveys were collected on week four and 13 were collected on week eight. The control group had ten participants and all participants filled in surveys on week zero, week four, and week eight. The sample population for both groups was small and this could have accounted for nonsignificant findings in many of the questions and nonsignificant findings in four of the five sub-categories. In research done on weight loss and self-efficacy many of the populations were much larger and



often the sample was split into several classes to have fewer participants in each class. This allowed the investigators more data to analyze and thus a better chance of examining the population.

### *Nutrition Education*

Presenting the nutrition education class which included the super foods presentations each week worked well. The class participants looked forward to trying a different super food recipe each week and learning the benefits of incorporating these foods into their daily meals. Feedback from the participants on the evaluation survey included several comments that the super food presentations were an excellent addition to the class.

During class periods participants would talk about the recipes that they had tried during the week that included super foods that were presented. It appeared that actually tasting and viewing the dishes helped the participants have more confidence when trying new recipes.

The class periods that focused on holiday, buffet and party eating were also received very well by the participants of Health Switch. The investigator prepared a buffet table that included only super foods which encouraged the participants to again try new recipe items but also provided ideas for lower calorie holiday dishes. Recipes for all buffet items were included with the packet of handouts they received during class. An encouraging trend noted was that the participants actually had weight loss over the holidays which suggested that education helped them make better decisions during holiday parties and celebrations.

The weight loss competition, while a good idea on its own, posed difficulties. Recommendations for future competitions would be to only have teams of people who were truly interested in winning the competition. Those members who came every week and took the competition seriously were frustrated with their teammates that seemed less committed to the competition. The competition took the total of weight loss within the group each week and divided it by the total beginning weight to determine the team in the lead each week. If participants did not weigh in or attend class, their prior weight was used in the average calculation.

The average mean score on the question “The weight loss competition helped me to lose weight” was 3.2 out of 4 which means that a fair share of participants agreed with this comment. So perhaps a smaller group of participants that were serious about the competition might have been better. The investigator is not convinced that the weight loss competition should be used in future classes. If the importance of the class is to promote healthier eating and the movement away from dieting, the competition may put pressure on people to lose weight when the focus should be on first becoming healthier eaters. Once healthier eating is in place weight loss if necessary may come as eating habits improve.

Repetition and reinforcement of particular themes at each weekly meeting seemed to be appropriate. Although there was not significant changes in self-efficacy in the subcategories as a whole there was improvement in single questions such as “I can resist eating at parties.” This was encouraging to the investigator as this piece was reinforced through out the classes with discussions on mindfulness while eating, taking care of yourself during the holidays, portion sizes, and making healthier dishes.

The participants enjoyed the handouts and especially liked the food demonstrations and food samples that were provided along with the featured super food(s) of the week. The participants were eager to learn how to incorporate healthier choices into their lives. An evaluation at the end of the eight sessions indicated that the participants also felt that this was an excellent part of the program (Table 19).

The nutrition trackers the investigator prepared for the participants (see Appendix E) were utilized more than food journals used in prior classes. When teaching prior classes the investigator found that the participants would use the food diaries regularly for a couple of weeks but the majority of participants would stop using them shortly after that. Comments from participants would include “no time to do them” and “I forget to do them” being the most common reasons. The nutrition trackers were being used by most of the class and at week eight when asked in class who was using them (10 people in attendance) eight people responded that they still were using them and many asked to have an on-line version e-mailed to them so that they could use them in the future. One comment on the evaluation also included the comment that the nutrition trackers were much better than keeping food diaries.

Using the nutrition tracker versus the food diary seemed to make the difference in making people aware and to record and think about what they were eating each day. The investigator will use these again in future classes that are taught and recommends this method for weight loss classes.

The exercise component was challenging to teach. Original plans for teaching exercise included participants getting handouts and a demonstration of different exercises as well as having the participants actually perform some of the exercises demonstrated in

class. The participant's were reluctant to perform the exercises and so usually only demonstrations of various exercises took place. The investigator also volunteered to lead some walking sessions outside of class but there was no interest shown in starting a program. From the class evaluations the participants liked the exercise piece but when asked to answer 4 = strongly agree, 3 agree, 2 disagree, and 1 strongly disagree the average score from the ten surveyed to the question "I have incorporated exercise into my daily routine" was 2.7 indicating that more education and training needed to be conducted in encouraging the exercise component of this program.

One recommendation for future classes to help incorporate exercise more effectively might to include an exercise component to the nutrition education classes – meaning that half the class is nutrition education based and the other half is exercise based. If the class was advertised as half lecture, half exercise participants would come to class knowing exercise was a part of the expectation and participation may have improved. As a result for the duration of the classes the participants would be at least getting thirty minutes of exercise on the day of class which might spark some interest for participants to incorporate exercise into their daily routines. Also demonstrating new types/kinds of exercises may introduce the participants to a new exercise activity they actually enjoy and could sustain. Additional education needs to stress the importance of not only exercise but daily activities to reduce calories and to determine if participants are ready and or willing to incorporate exercise or reduction of calories.

Teaching the class mindfulness while eating also seemed to work well. The participants were interested to learn about reducing calorie intake by being conscious of what they were putting into their mouths each day. This theme was repeated over and

over in the classes with the hope that the participants became more aware of the calories that were making a difference in their intake.

The investigator sent mid-week e-mails to the participants to maintain connections with them. The purpose of the e-mails was to let participants know when they left class for the week they weren't alone for the balance of the week. The e-mails were well-received by the class and often promoted one-on-one conversations with the participants that allowed the investigator to connect with some of individual needs of participants. This comment was included in one of the evaluations; "I really enjoyed the class and information Cheri provided for us. She was also very helpful for me via email due to some health issues and my weight concerns. Thank you."

#### *Self-efficacy principles used in nutrition education*

When looking at Bandura's (1994) four main sources of influence in building self-efficacy, the investigator tried to incorporate all four in the nutrition component of Health Switch.

The first way to build self-efficacy according to Bandura was by mastering experiences. One example of how the investigator worked on this principle was in goal setting with the class. Goal setting was done each week around fruit and vegetable consumption (incorporation or increasing) and exercise (increasing or adding) was done in order to increase the participant's self-efficacy in implementing these behaviors (eating more fruit and vegetables and participating in exercise). The investigator reinforced the need for setting goals around these particular behaviors that were challenging but also attainable. According to Bandura (1994) self-efficacy can be increased by mastering these experiences but failures can quickly dash self-efficacy if failure in mastering an

experience comes too quickly. Each week the class shared accomplishments and also looked at ways to overcome obstacles they may have encountered by having the class share suggestions or ideas about ways to address barriers.

Other ways this principle was incorporated into the nutrition education was by introducing portion sizes for all food groups and also beverage consumption. The participants got hands-on experience in learning portions and the principles were reinforced week after week.

Mindfulness about reducing caloric consumption by one to two hundred calories per day was discussed in multiple classes. This was done to help provide participants with ideas how now to master mindlessness and ways to master mindfulness through experience.

The second principle according to Bandura (1994) in increasing self-efficacy is by having experiences that are provided by social models. When people are ready to change they will commonly look to modeling to reinforce the behaviors that they want to change. Specifically they will look for the behaviors they want to change and look for the expert in this field. Knowledge is shared and effective ways to reach goals are realized.

The investigator worked on this in several ways in the class. Modeling was shown through prior success stories. The investigator shared strategies in weight loss that were successful to prior weight loss participants. Also the investigator prompted the sharing of knowledge within the class. There were many participants that were experiencing steady weight loss throughout the session. Discussions in class included tips and ideas from participants to help other participants who were struggling. For example, during the holidays the participants created a list of things they had done in the past to

successfully reduce calories during special events. The class was encouraged to pick items from the extensive list in an effort to incorporate them during the holidays. When we met after the holidays the sharing of successes and setbacks was encouraged and discussed so that new ideas could be fostered for change.

According to Bandura (1994) social persuasion is the third way to increase a person's self-efficacy. Bandura felt that people who are persuaded verbally possess the abilities to master given activities and are more likely to try harder and be resilient during difficult times.

The investigator encouraged this principle of social persuasion through the mid-week e-mails that were sent to the participants in hopes of reinforcing them to succeed. Each e-mail started with a motivating quote to enable the participants to think about positive influences in their lives. The majority of the e-mails focused on their ability to change whatever they wanted to change and if they weren't moving in that direction there were ideas to guide them in the right direction. Each e-mail ended with "get out and move your bodies and eat clean and healthy."

Social persuasion was used in the exercise component presented to class each week – along with an attempt to help the participants feel as though they could master different types of exercises (cardio, strength training, and stretching).

The fourth influence is that people also rely partly on their somatic and emotional states in judging their own capability in performing a difficult task. Bandura (1994) felt that it wasn't the aches and pains or discomforts that a person felt that influenced self-efficacy growth but rather how the person interpreted these setbacks.

This was a harder principal to reinforce to the class but the investigator did it through examples of setbacks. The investigator discussed in the goal setting, and in every thing that they were learning that instead of looking at something as not working to instead look at it as what did they learn from the experience. Even when goals were not reached the investigator encouraged the class or person to think about what they did learn from the experience and what they could take away from the experience.

### *Undergraduate Students*

Undergraduate students from the University of Stout earned field experience hours by researching, preparing, and presenting on nutrition education pieces throughout the eight week session. The investigator had a number of topics available for the undergraduate students to select from for presentations to the class. The undergraduate students were allowed to volunteer for as many of the topics they wanted depending on their availability.

The investigator had offered undergraduate students the opportunity to volunteer to teach prior weight loss classes in the past and had ran into a few obstacles, so this time requirements for teaching included having copies of handouts and their presentations to the investigator one week prior to their actual presentation. This allowed the investigator time to review the topics being presented and to make recommendations if needed.

This part of the program went well. The undergraduate students handled themselves professionally and had appropriate handouts. During the second week, when the topic included portion sizes each of the undergraduate students had set up a station and the participants were allowed to move around the room and learn about portions of carbohydrates, beverages, protein, fruit and vegetables, and fats and sweets. For



example, this presentation by the undergraduates allowed the participants to eye ball portion sizes of pasta and measure the ounces of beverage in common shaped glasses.

The undergraduate students were helpful in collecting surveys, weighing the participants, assisting in caloric determination for assignment of nutrition tracker forms and for taking measurements.

Future recommendations for utilizing undergraduate students to their full extent is making certain they have completed the basic nutrition classes and allowing them to determine topics for discussion. Red Cedar Medical Center needed a class agenda prior to the beginning of the classes so it was not feasible to allow them the freedom to choose topics.

*What the investigator learned during the eight- week program*

Some things that the investigator learned while teaching this eight week program is that there is a growing interest in the public for healthful eating versus weight loss. The investigator originally intended for the super foods to be just a small part of the class study but with each week it became clear that this was extremely interesting and well received by the class. The participants worked in a health care field so this could have attributed to the extra interest in the super foods.

The investigator continues to struggle with getting exercise incorporated successfully into the weight loss classes. The instructor encountered similar problems in incorporating exercise in prior classes. Future classes will need to continue to work on this and find ways to improve participant's self-efficacy surrounding the activity of exercise.

### *Conclusions*

Fitzgibbon, Stolley, and Kirschenbaum (1993) found that obese people tend to show more symptoms of distress, negative emotional eating, overeating, difficulty in resisting temptation and less exercise than did their normal weight control group in their study.

An interesting trend was found in the measurements of self-efficacy within the subcategories of this research that supports the findings of Fitzgibbon et al., (1993). The control group started out weighing less than the experimental group, and in all but one category the control group started out with higher self-efficacy than the experimental group. The category that the experimental group started out higher than the control in was availability of food and the mean scores were very close (4.53 and 4.72).

Self-efficacy has been shown to be a powerful predictor of health behavior (Abusabha & Achterberg, 1997). Most intervention studies assessing self-efficacy indicate that increases in knowledge, training, experience, and/or familiarity with a task are likely to result in increases in self-efficacy scores for that task (Abusabha & Achterberg, 1997). At the end of the eight week nutrition education program the experimental group had exceeded the control group in mean scores of self efficacy, suggesting that although there were not significant findings in three of the five subcategories of self-efficacy scores (one at  $p=.05$  and one tending to significance  $p = .073$ ), self-efficacy in the experimental group was indeed increasing.

As in this study, results from prior studies suggested that self-efficacy increases over the course of obesity treatment (Clark et al; 1991; Clark et al; 1996; Glynn & Ruderman, 1986; Pinto et al; 1999; Prochaska et al; 1992). These findings were also

found in this research. Although significance was not found in all of the subcategories, the self-efficacy scores were increasing which suggested that more time, more participants, or continued education would have continued the trend towards improved self-efficacy.

These findings might indicate that nutrition education increased self-efficacy (but our small sample population played a role in insignificant findings) which did lead to increased weight loss and was significant over time at the 95% confidence level. Self-efficacy has also been shown to predict subsequent weight loss in prior studies (Dutton et al; 2004). Again, in this research there was significant weight loss but was it due to self-efficacy is not clear.

#### *Recommendations*

If these classes are conducted again and self-efficacy surveys are used again, one suggestion would be to get a larger group and then conduct several classes at the same time so that the classes can be small enough to effectively work with the participants but a larger sample size could still be obtained. In a prior study by Bernier (1986) a large sample population was used and then the group was split into classes of 12 to 15 participants to allow a larger sample size but still maintain a small class group for effective teaching.

It would also be recommended to do this research with both genders to more accurately compare against prior studies.

It is unclear if significance would have been found if the population was larger or if the classes needed to be facilitated for a longer duration. Perhaps a twelve week or longer education period may endorse self-efficacy and promote self-efficacy growth.

Recommendations for further research study would include an emphasis in nutrition education that includes ways to help participants keep the weight off long term. It seems clear through the research that participants can lose weight on restrictive caloric intake, physical activity, and multiple behavioral approaches – but the challenge appears to be in the maintenance of the weight loss.

Another recommendation is to incorporate exercise into the classes by adding an exercise component to the curriculum of the weight loss classes. This may spark interest in exercise and improve participant's self-efficacy surrounding the activity of exercise.

The investigator recommends for future weight loss classes that the program contains a way to stay connected to the participants during the week. An e-mail or phone call may play a role in participant's weight loss. Feedback from the participants from this class and prior classes that the investigator facilitated indicated this as being a positive experience and motivator for weight loss.

A recommendation for incorporating the WELS survey into future weight loss programs is that a review of the questions and subcategories be done and that the facilitator focuses the education curriculum around these questions. This may help facilitate weight loss and self-efficacy growth as measured by this instrument within the participants.

For example, the classes from this study fell over two holidays and for that reason the investigator spent considerable time working with the participants of Health Switch to make healthier food choices and to work on mindfulness in eating during the holidays. This theme was reinforced many times over the eight weeks of nutrition education. When looking at significance in individual questions from the WEL survey, *I can resist*

*eating even when at a party* was significant at the 95% confidence level in this investigation.

Similarly, the investigator spent considerable time talking about emotional eating, mindfulness in eating, determining their readiness to change. Again these topics were repeated over and over during the eight weeks of nutrition education. Again, looking at the individual questions from the WEL survey, *I can resist eating when I'm depressed or down* was significant at the 95% confidence level for this investigation.

The investigator spent time each week, going over the eight healthy habits for moving from a dieting mentality to just eating healthier (Foco & Moss, 2006) and one of the principles is that you eat breakfast everyday and two to three hours before bed you stop eating. When looking at the individual questions from the WEL survey, *I can resist eating before bed* was significant at the 95% confidence level as well.

## References

- Abusabha, R., & Achterberg, C. (1997). Review of self-efficacy and locus of control for nutrition- and health-related behavior. *Journal of the American Dietetic Association, 97*, 1122-1132.
- Bandura, A. (1994). Self-efficacy. *Encyclopedia of human behavior, 4*, 71-81. New York, NY: Academic Press.
- Bellack, A.S. (1975). Behavior therapy for weight reduction. *Addictive Behaviors, 1*, 73-82.
- Bennett, G. A. (1986). An evaluation of self-instructional training in the treatment of obesity. *Addictive Behaviors, 11*, 125-134.
- Bell-Wilson, J.A. (2006). The new proposed healthy beverage guidelines. *Today's Dietitian, 58-60*.
- Bernier, M. (1986) Self-efficacy, outcome, and attrition in a weight-reduction program. *Cognitive Therapy and Research, 10*, 319-338.
- Brownell, K. D. (1982). Obesity: understanding and treating a serious, prevalent and refractory disorder. *Journal of Consulting and Clinical Psychology, 50*, 820-840.
- Brownell, K.D. (1984). Behavioral, psychological, and environmental predictors of obesity and success in weight reduction. *International Journal of Obesity, 8*, 543-550.
- Brownell, K.D., & Jeffery, R.W. (1987). Improving ong-term weight loss: pushing the limits of treatment. *Behavior Therapy, 18*, 353-374.
- Brownell, K.D., & Kramer, F.M. (1989). Behavioral management of obesity. *Medical Clinics of North America, 73*, 185-201.

- Buffenstein, R., Karklin, A., & Driver H.S. (2000). Beneficial physiological and performance responses to a month of restricted energy intake in healthy overweight women. *Physiology and Behavior*, 68, 439-444.
- Centers for Disease Control and Prevention - Department of Health and Human Services (2006, September). *Overweight and Obesity*, Retrieved October 28, 2006, from: <http://www.cdc.gov/ccdphp/dnpa/obesity/index.htm>
- Clark, M.M., Abrams, D.B., Niaura, R.S., Eaton, C.A., & Rossi, J.S. (1991). Self-efficacy in weight management. *Journal of Consulting and Clinical Psychology*, 59, 739-744.
- Clark, M.M., Cargill, B.C., Medeiros, M.L., & Pera, V. (1996). Changes in self-efficacy following obesity treatment. *Obesity Research*, 4, 179-181.
- Collins, R.L., Rothblum, E.D., & Wilson, G.T. (1986). The comparative efficacy of cognitive and behavioral approaches to the treatment of obesity. *Cognitive Therapy and Research*, 10, 299-317.
- Conditte, M.M., & Lichtenstein, E. (1981). Self-efficacy and relapse in smoking cessation programs. *Journal of Consulting and Clinical Psychology*, 49, 648-658.
- Crawford, D., Jeffery, R.W., & French, S.A. (2000). Can anyone successfully control their weight – findings of a three year community-based study of men and women. *International Journal of Obesity*, 24, 1107-1110.
- Davis, J.N., Hodges, V.A., & Gillham, M.B. (2006). Normal-weight adults consume more fiber and fruit than their age- and height-matched overweight/obese counterparts. *Journal of the American Dietetic Association*. 106, 833-840.

- Dutton, G.R., Martin, P.D., Rhode, P.C., & Brantley, P.J. (2004). Use of the weight efficacy lifestyle questionnaire with African American women: Validation and extension of previous findings. *Eating Behaviors, 5*, 375-384.
- Edell, B.H., Edington, S., Herd, B., O'Brien, R.M., & Witkin, G. (1986). Self-Efficacy and self-motivation as predictors of weight loss. *Addictive Behaviors, 12*, 63-66.
- Fabricatore, A.N. (2007). Behavior therapy and cognitive-behavioral therapy of obesity: is there a difference. *Journal of the American Dietetic Association, 107*, 92-99.
- Feitosa, M. F., Borecki, I., Hunt, S.C., Arnett, D.K., Rao, D.C., & Province, M. (2000). Inheritance of the waist-hip ration in the national heart, lung and blood institute family heart study. *Obesity Research, 8*(4), 294-300.
- Ferguson, J.M. (1975). *Learning to eat: Behavior modification for weight control*. Palo Alto, CA: Bull Publishing.
- Fitzgibbon, M.L., Stolley, M.R., & Kirschenbaum, D.S. (1993). Obese people who seek treatment have different characteristics than those who do not seek treatment. *Health Psychology, 12*(5), 342-345.
- Foco, Z. & Moss, S. (2006). *Water with lemon*. Onsted, MI: ZHI Publishing.
- Foster, G. D., Wadden T.A., Vogt, R.A. & Brewer G. (1997). What is a reasonable weight loss? Patients' expectations and evaluations of obesity treatment outcomes. *Journal of Consulting and Clinical Psychology, 65*, 79-85.
- Glynn, S.M., & Ruderman, A. J. (1986). The development and validation of an eating self-efficacy scale. *Cognitive Therapy and Research, 10*, 403-420.
- Hill, J.O., Thompson, H., Wyatt, H. (2005). Weight maintenance: what's missing? *Journal of the American Dietetic Association, 105*, S63-S66.



- Jeffery, R.W., Wing, R.R., & Mayer, R.R. (1998). Are smaller weight losses or more achievable weight loss goals better in the long term for obese patients? *Journal of Consulting and Clinical Psychology*, 66(4), 641-645.
- Jequier, E. (1987). Measurement of energy expenditure in clinical nutritional assessment. *Journal of Parenteral Enteral Nutrition*, 11, 86S-89S.
- Johnson, D.W., & Johnson, R.T. (1985). The process of nutrition education. *Journal of Nutrition Education*, 17, S1-S27.
- Kalodner, C.R., & Delucia, J.L. (1990). Components of effective weight loss program: Theory, research, and practice. *Journal of Counseling and Development*, 68, 427-433.
- Kushner, R.F., & Blatner, D.J. (2005). Risk assessment of the overweight and obese patient. *Journal of the American Dietetic Association*, 105, S53-S62.
- Lee, R.D., Nieman, D.C (2003). *Nutritional assessment* (3<sup>rd</sup> ed.). New York, NY: McGraw-Hill.
- Matarese, L.E. (1997). Indirect calorimetry: technical aspects. *Journal of the American Dietetic Association*, 97, S154-S160.
- Mattfeldt-Beman, M.K., Corrigan, S.A., Stevens, V.J., Sugars, C.P., Dalcin, A.T., Givi, J., & et al. (1999). Participants' evaluation of a weight-loss program. *Journal of the American Dietetic Association*, 99, 66-71.
- Pinto, B.M., Clark, M.M., Cruess, D. G., Szymanski, L., & Pera, V. (1999). Changes in self-efficacy and decisional balance for exercise among obese women in weight management program. *Obesity Research*, 7, 288-292.

- Pratt, S. & Matthews, K. (2005). *Super foods Rx: Fourteen foods that will change your life*. New York, NY: HarperCollins Publishers.
- Prochaska, J.O., Norcross, J.C., Fowler, J.L., Follick, M.J., & Abrams, D.B. (1992). Attendance and outcome in a work site weight control program: Processes and stages of change as process and predictor variables. *Addictive Behaviors, 17*, 35-45.
- Radford, B. (2006, March). Fat and happy: Why most people don't diet. Retrieved June 27, 2006, from: [www.livescience.com/humanbiology/00302\\_diet\\_reality.html](http://www.livescience.com/humanbiology/00302_diet_reality.html)
- Ramirez, E.M., & Rosen J.C. (2001). A comparison of weight control and weight control plus body image therapy for obese men and women. *Journal of Consulting and Clinical Psychology, 69*(3), 440-446.
- Ravussin, E., & Tataranni, A. (1997). Dietary fat and human obesity. *Journal of the American Dietetic Association, 97*, S42-S46.
- Schoeller, D.A., & Buchholz, A.C. (2005). Energetics of obesity and weight control: does diet composition matter? *Journal of the American Dietetic Association, 105*, S24-S28.
- Shannon, B., Bagby, R., Wang, M.Q., & Trenkner, L. (1990). Self-efficacy: a contributor to the explanation of eating behavior. *Health Education Research, 5*(4), 395-407.
- Skender, M.L., Goodrick, G.K., Del Junco, D.J., Reeves, R. S., Darnell, L., Gotto, A.M., et al. (1996). Comparison of 2-year weight loss trends in behavioral treatments of obesity: diet, exercise, and combination interventions. *Journal of the American Dietetic Association, 96*, 342-346.

St. Jeor, S.T., Cutter, G.R., Perumean-Chaney, S.E., Hall, S.J., Herzog, H. & Bovee, V.

(2004). The practical use of charts to estimate resting energy expenditure in adults. *Topics in Clinical Nutrition*, 19(1), 51-56.

U.S. Department of Health and Human Services. (2001, December). *Overweight and obesity threaten U.S. health gains*. U.S. Department of Health and Human Services. Retrieved May 19, 2007 from:

[http://www.surgeongeneral.gov/news/pressreleases/pr\\_obesity.PDF](http://www.surgeongeneral.gov/news/pressreleases/pr_obesity.PDF).

Wansink, B. (2006). *Mindless eating why we eat more than we think*. New York, NY: Bantam Dell.

Wing R.R. (2002). Behavioral weight control. In Wadden TA, Stunkard AJ (Ed).

*Handbook of Obesity Treatment*. (pp.301-316). New York: Guilford Press, NY.

Zelman, K. (2006, June). Lose weight, gain tons of benefits. WebMD Weight loss Clinic.

Retrieved June 26, 2006, from:

[www.webmd.com/content/article/124/115531.htm?printing=true](http://www.webmd.com/content/article/124/115531.htm?printing=true).



Stout Solutions + Research Services  
152 Voc Rehab Building

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

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

## Appendix A: Protection of Human Subjects

**Date:** September 29, 2006

**To:** Cheri Rott

**Cc:** Carol Seaborn

**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**

Your project, "*Health Switch an 8 Week Healthy Nutrition Program*" has been approved by the IRB through the expedited review process. This protocol has been approved provided the following items are addressed. Then the measures you have taken to protect human subjects are adequate to protect everyone involved, including subjects and researchers.

**Reviewer comments:** Please clarify to participants that the survey is repeated, not separate surveys, if that is what you are intending.(3 mentioned in consent form)If there are 3 then they all need to be reviewed by the reviewer. FYI-protocol had numerous punctuation and grammatical errors.

**Please send revisions to Research Services - 152 Voc Rehab.**

**Please copy and paste the following message to the top of your survey form before dissemination:**

<p><b>This research has been approved by the UW-Stout IRB as required by the Code of Federal Regulations Title 45 Part 46.</b></p>
--

This project is approved through September 29, 2007. 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:dd

Appendix B: Weight Loss Self-Efficacy Survey  
**Weight Loss Self-Efficacy Survey**

Participant's number: \_\_\_\_\_ Weight: \_\_\_\_\_ pounds Gender: male  
female

Please rate the following statements using a scale of 1 to 10:

- |       | 1   | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10             |
|-------|---|---|---|---|---|---|---|---|---|----------------|
|       | not confident   |   |   |   |   |   |   |   |   | very confident |
| _____ | I can resist eating when I am anxious (nervous)                               |   |   |   |   |   |   |   |   |                |
| _____ | I can control my eating on the weekends                                       |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating even when I have to say "no" to others                    |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating when I feel physically run down                           |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating when I am watching TV                                     |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating when I have experienced failure                           |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating even when high calorie foods are available                |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating even when I think others will be upset if I don't eat     |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating when I feel uncomfortable                                 |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating when I am depressed (or down)                             |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating when there are many different kinds of food available     |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating even when I feel it's impolite to refuse a second helping |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating even when I have a headache                               |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating when I am reading   |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating when I'm angry (or irritable)                             |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating even when I am at a party                                 |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating even when others are pressuring me to eat                 |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating when I am in pain   |   |   |   |   |   |   |   |   |                |
| _____ | I can resist eating just before going to bed                                  |   |   |   |   |   |   |   |   |                |

## Appendix C: Subcategory of Survey Questions

### Negative Emotions

- I can resist eating when I am anxious (nervous)
- I can resist eating when I am depressed (or down)
- I can resist eating when I'm angry (or irritable)
- I can resist eating when I have experienced failure

### Availability

- I can control my eating on the weekends
- I can resist eating when there are many different kinds of food available
- I can resist eating even when I am at a party
- I can resist eating even when high calorie foods are available

### Social Pressure

- I can resist eating even when I have to say "no" to others
- I can resist eating even when I feel it's impolite to refuse a second helping
- I can resist eating even when others are pressuring me to eat
- I can resist eating even when I think others will be upset if I don't eat

### Physical Discomfort

- I can resist eating when I feel physically run down
- I can resist eating even when I have a headache
- I can resist eating when I am in pain
- I can resist eating when I feel uncomfortable

### Positive Activities

- I can resist eating when I am watching TV
- I can resist eating when I am reading
- I can resist eating just before going to bed

Scale of 1 to 10 1 being not confident – 10 being highly confident.

## Appendix D: Motivational E-mail

Sunday e-mail sent to class:

You may have to fight a battle more than once to win it.  
-Margaret Thatcher-

Hey everyone!

How's the Christmas shopping coming? Did you park a little farther out and walk in? Did you do an extra loop or two around the mall to burn a few extra calories? If you stood in line for over an hour to see Santa

-  
you could have burned 85 calories :)

You may have to fight a battle more than once to win it.... how true. Sometimes when we think we have it all figured out and we finally did it

right - life can get in the way and we find ourselves back at square one

- starting all over. I know for me each time I have to start over on something I feel a little wiser and I come into it knowing some new tricks - but sometimes I feel overwhelmed... and that can be where trouble comes in. If you give up or think you just can't do it than you

are probably right. We set ourselves up with our own negative or positive self talk and we can be our own worst enemies....or our own best friends!

There is something called the stages of change model that can be applied

to any behavior you are trying to change in your life (not just weight loss - could be cigarette smoking, too much caffeine, not exercising - you get the picture).

This model states that there are 5 distinct stages in behavior change:

1 - precontemplation - in this stage the person is not intending to make

behavior changes in the foreseeable future.

2- contemplation - the person is considering a behavior change but not yet making a firm commitment to change 3- preparation - there is a commitment to changing the behavior in the next 30 days but not yet changing the behavior (may have attempted this change before and have made a few small adjustments).

4- Action stage - the person is successfully changing behavior. THIS IS WHERE WE WANT TO BE

5- maintenance - behavior change sustained over 6 months. If the person

relapses then they start over in the cycle.

So an interesting thing -we may think we are in the action stage ready to change our behaviors and move forward in health - but we may actually

be in stages 2 or 3 or eek 1! It is not until we move our HEADS into that 4th stage and do what has to be done to actually make the changes



we want to make that it happens for us!

So as we approach those new years resolutions - think about the stages of change model - and figure out where you are at in the model - than set some goals to help yourself get to the action stage and make it happen! You can do whatever you want to do!

This week we are having a Super food Buffet! There will be lots of fun stuff for you to try from the super food categories - Setting some goals for the new week and encouraging each other and weighing in for the last time for the competition!

See you Thursday - get out and move your bodies (but stay warm)  
Eat clean and healthy





Appendix F: Goal Setting Sheet

# Goal Setting

THIS WEEK I WILL SET A GOAL TO:

**Exercise:**

**Water:**

**Fruit and Veggies:**

**What things could keep you from reaching your goals this week?**

**What do you have to do in order to make sure your goals happen?**

## Appendix G: Physical Activity Calories per Minute

**Physical Activity Calories per Minute**

<b>Your Weight</b>	<b>Low Intensity</b>	<b>Medium Intensity</b>	<b>High Intensity</b>
<b>Equal to or less than:</b>	<b>Raking, active gardening, recreational sports, e.g. softball, volleyball, golf (no cart), weight lifting</b>	<b>Walking, mowing, tennis, biking, light aerobic, inline skating, calisthenics</b>	<b>Moderate jogging, stair machine, racquetball, swimming</b>
<b>100</b>	<b>1 cal./min</b>	<b>3 cal./min.</b>	<b>7 cal./min.</b>
<b>120</b>	<b>1 cal./min.</b>	<b>4 cal./min.</b>	<b>8 cal./min.</b>
<b>140</b>	<b>1 cal/min.</b>	<b>5 cal/min.</b>	<b>11 cal/min</b>
<b>160</b>	<b>2 cal/min</b>	<b>5 cal./min.</b>	<b>11 cal./min</b>
<b>180</b>	<b>2 cal/min</b>	<b>6 cal./min.</b>	<b>12 cal./min.</b>
<b>200</b>	<b>2 cal./min.</b>	<b>7 cal./min.</b>	<b>13 cal./min</b>
<b>220</b>	<b>2 cal./min.</b>	<b>7 cal./min.</b>	<b>15 cal./min.</b>
<b>240</b>	<b>3 cal./min.</b>	<b>8 cal/min</b>	<b>16 cal/min</b>
<b>260</b>	<b>3 cal./min.</b>	<b>9 cal./min.</b>	<b>17 cal/min</b>
<b>280</b>	<b>3 cal./min.</b>	<b>9 cal./min.</b>	<b>19 cal/min</b>
<b>300</b>	<b>3 cal./min.</b>	<b>10 cal./min.</b>	<b>20 cal./min.</b>
<b>320</b>	<b>4 cal./min.</b>	<b>11 cal./min.</b>	<b>21 cal./min</b>
<b>340</b>	<b>4 cal./min.</b>	<b>11 cal./min.</b>	<b>23 cal./min</b>
<b>360</b>	<b>4 cal./min</b>	<b>12 cal./min</b>	<b>24 cal./min.</b>
<b>380</b>	<b>4 cal./min.</b>	<b>13 cal./min.</b>	<b>25 cal./min.</b>
<b>400</b>	<b>4 cal./min.</b>	<b>13 cal./min.</b>	<b>26 cal/min.</b>
<b>420</b>	<b>5 cal/min.</b>	<b>14 cal./min</b>	<b>28 cal/min.</b>
<b>440</b>	<b>5 cal/min</b>	<b>15 cal./min.</b>	<b>29 cal./min.</b>
<b>460</b>	<b>5 cal./min</b>	<b>15 cal./min.</b>	<b>30 cal./min.</b>
<b>480</b>	<b>5 cal./min.</b>	<b>16 cal./min</b>	<b>32 cal./min.</b>
<b>500</b>	<b>6 cal./min.</b>	<b>17 cal./min.</b>	<b>33 cal./min</b>

Source: Luther Midelfort – Mayo Health Systems

## Appendix H: Fruit Quiz

## What Fruit...?

1. What fruit gave Sir Isaac Newton a headache and is famous in the stories of Adam and Eve?
2. What fruit was traditionally stepped on by foot to make wine?
3. What fruit is needed to make a pina colada cocktail?
4. What fruit comes in bunches and has an easy to peel yellow skin?
5. What fruit is Seville famous and is used to make marmalade?
6. What fruit would have grown on the tree that the young George Washington chopped down?
7. What fruit are water, cantaloupe and honeydew all types of?
8. What fruit when dried becomes a prune?
9. What fruit is used to make jam and is served with a shortcake base in the U.S.?
10. What fruit has one seed and a green outer layering?
11. What fruit group has been shown to prevent certain cancers and has a particularly high fiber content?
12. What fruit was one of our super foods?
13. True or False. A diet high in fruit can help to detoxify our bodies of toxic substances.
14. True or False. Tomatoes are vegetables.
15. True or False. Freshly squeezed fruit juices will not give your body the same benefits of eating the whole piece of fruit.

## Appendix I: Consent Forms

### Consent to Participate in UW-Stout Approved Research

**Title:** Health Switch – an 8 week healthy nutrition program

**Investigator:** Cheri Rott  
715-265-7292  
[rottcc@uwstout.edu](mailto:rottcc@uwstout.edu)

**Research Sponsor:** Carol Seaborn  
715-232-2216  
[seabornc@uwstout.edu](mailto:seabornc@uwstout.edu)

#### **Description:**

Health Switch is an 8 week healthy nutrition program designed to help people become nutritionally balanced in their lives. This program will contain components to educate participants on life changing habits to meet their nutritional goals. Another component in this health program will be to look at self efficacy. Self-efficacy is defined as the drive from within to succeed. This study will look at self-efficacy within this group and also a group outside the weight loss program.

#### **Time Commitment:**

Prior to participating in this study, you will need to sign a consent form. You should attend all 8 weeks of class to maximize health benefits gained through education but attendance is not mandatory. To participate in this project you will fill out a pre-survey, a mid-survey and a post-survey; all three surveys are the same you will just be re-taking the survey to see if your responses have changed. I will look at the answers to evaluate progress during the program. Each week you will weigh in to monitor your weight. If you are participating in the control group, you will fill out the same surveys as the participants at the same time but will not be attending classes.

#### **Risks and Benefits:**

Participation in this study does not carry risk. However you will need to share personal information such as weight, age and gender. The benefits of participating in this study include learning ways to live a healthier lifestyle and possibly increase self efficacy. Also, by participating in this study you are helping to determine what works best in conducting future nutrition classes for the community.

#### **Minors:**

If you are under the age of 18 years both you and your legal guardian must sign this consent form in order for you to participate in this study.

#### **Confidentiality:**

Your names will not be included on any survey documents; you will be identified only by a numeric identifier. This informed consent will not be kept with any of the other documents completed with this project. All the data collected during the program will be

kept in a locked area in which only the researcher and researcher's advisor will have access. At the completion of this research, all data that identifies individual participants will be shredded.

**Right to Withdraw:**

Your participation in this study is entirely voluntary. You may choose not to participate without any adverse consequences. Should you choose to participate and later wish to withdraw from the study, you may discontinue your participation at that time without incurring adverse consequences.

**IRB Approval:**

This study has been reviewed and approved by The University of Wisconsin-Stout's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and University policies. If you have questions or concerns regarding this study please contact the Investigator or Research Advisor. If you have any questions, concerns, or reports regarding your rights as a research subject, please contact the IRB Administrator.

**Investigator:** Cheri Rott  
715-265-7292  
rottcc@uwstout.edu

**Research Advisor:** Carol Seaborn  
715-232-2216  
seabornc@uwstout.edu

**IRB Administrator:**  
Susan Foxwell,  
Director, Research Services  
152 Vocational Rehabilitation Bldg.  
UW-Stout  
Menomonie, WI 54751  
715-232-2477  
foxwells@uwstout.edu



**Statement of Consent:**

By signing this consent form you agree to participate in the study entitled, Health Switch an eight week healthy nutrition program.

Signature \_\_\_\_\_ Date \_\_\_\_\_

Signature of parent or guardian \_\_\_\_\_ Date \_\_\_\_\_  
(if under 18 years of age)

Appendix J: Survey Questions  
**Weight Loss Self-Efficacy Survey Questions Numbered for Table  
Reference**

Number	Question
1.	I can resist eating when I am anxious (nervous)
2.	I can control my eating on the weekends
3.	I can resist eating even when I have to say “no” to others
4.	I can resist eating when I feel physically run down
5.	I can resist eating when I am watching TV
6.	I can resist eating when I have experienced failure
7.	I can resist eating even when high calorie foods are available
8.	I can resist eating even when I think others will be upset if I don’t eat
9.	I can resist eating when I feel uncomfortable
10.	I can resist eating when I am depressed (or down)
11.	I can resist eating when there are many different kinds of food available
12.	I can resist eating even when I feel it’s impolite to refuse a second helping
13.	I can resist eating even when I have a headache
14.	I can resist eating when I am reading
15.	I can resist eating when I’m angry (or irritable)
16.	I can resist eating even when I am at a party
17.	I can resist eating even when others are pressuring me to eat
18.	I can resist eating when I am in pain
19.	I can resist eating just before going to bed

## Appendix K: Table 13; Question number 1

Table 13

Mean Scores for Question 1: *I can resist eating when I'm anxious* at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

	Week 0	Week 4	Week 8
Control	5.30±2.791 <sup>1</sup>	5.50±3.10	6.80±2.57
Experimental	4.00±2.78	5.50±1.51	7.25±1.04
Entire sample	4.72±2.78	5.50±2.46	7.00±2.00
Source of Variation	F Value	P Value	
Control/Experiment	.09	.773	
Test Time	8.67	.001	
Control/Experimental by time	1.24	.304	

<sup>1</sup>Means and Standard Deviation  
Survey scores 1-10 (1 being not confident, 10 being very confident)

## Appendix L: Table 14; Question number 2

Table 14

Mean Scores for Question 2: *I can control my eating on the weekends* at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

	Week 0	Week 4	Week 8
Control	4.80±2.74 <sup>1</sup>	5.40±3.44	6.30±2.58
Experimental	4.75±2.66	5.50±1.60	6.38±1.41
Entire sample	4.78±2.63	5.44±2.71	6.33±2.09
Source of Variation	F Value	P Value	
Control/Experiment	.02	.969	
Test Time	4.26	.023	
Control/Experimental by time	.01	.989	

<sup>1</sup>Means and Standard Deviation

Survey scores 1-10 (1 being not confident, 10 being very confident)

## Appendix M: Table 15; Question number 3

Table 15

Mean Scores for Question 3: *I can resist eating even when I have to say "no" to others* at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

	Week 0	Week 4	Week 8
Control	5.60±3.75 <sup>1</sup>	5.90±2.64	6.90±2.77
Experimental	5.38±2.20	6.25±1.49	7.63±1.06
Entire sample	5.50±3.07	6.06±2.16	7.22±2.16
Source of Variation	F Value	P Value	
Control/Experiment	.07	.799	
Test Time	7.73	.002	
Control/Experimental by time	.54	.587	

<sup>1</sup>Means and Standard Deviation  
Survey scores 1-10 (1 being not confident, 10 being very confident)

## Appendix N: Table 16; Question number 4

Table 16

---

Mean Scores for Question 4: *I can resist eating when I feel physically run down* at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

---

	Week 0	Week 4	Week 8
Control	6.40±2.84 <sup>1</sup>	6.90±2.85	7.30±1.89
Experimental	4.63±2.56	5.25±1.39	7.00±1.60
Entire sample	5.61±2.79	6.17±2.41	7.17±1.72
Source of Variation	F Value	P Value	
Control/Experiment	1.75	.205	
Test Time	5.94	.253	
Control/Experimental by time	1.43	.253	

---

<sup>1</sup>Means and Standard Deviation

Survey scores 1-10 (1 being not confident, 10 being very confident)

## Appendix O: Table 17; Question number 5

Table 17

Mean Scores for Question 5: *I can resist eating when I am watching TV* at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

	Week 0	Week 4	Week 8
Control	5.50±3.47 <sup>1</sup>	5.90±3.41	5.90±2.96
Experimental	6.25±2.49	6.63±1.77	7.50±2.07
Entire sample	5.83±3.02	6.22±2.76	6.61±2.66
Source of Variation	F Value	P Value	
Control/Experiment	.63	.440	
Test Time	3.27	.051	
Control/Experimental by time	1.19	.318	

<sup>1</sup>Means and Standard Deviation

Survey scores 1-10 (1 being not confident, 10 being very confident)

## Appendix P: Table 18; Question number 6

Table 18

Mean Scores for Question 6: *I can resist eating when I have experienced failure* at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

	Week 0	Week 4	Week 8
Control	5.40±3.06 <sup>1</sup>	5.90±3.41	7.10±2.38
Experimental	4.75±2.49	5.38±1.60	6.63±1.51
Entire sample	5.11±3.07	5.67±2.70	6.89±1.992
Source of Variation	F Value	P Value	
Control/Experiment	.28	.604	
Test Time	4.05	.027	
Control/Experimental by time	.01	.990	

<sup>1</sup>Means and Standard Deviation

Survey scores 1-10 (1 being not confident, 10 being very confident)



## Appendix Q: Table 19; Question number 7

Table 19

Mean Scores for Question 7: *I can resist eating even when high calorie foods are available* at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

	Week 0	Week 4	Week 8
Control	4.90±3.35 <sup>1</sup>	5.10±2.96	5.40±3.10
Experimental	4.88±2.36	5.63±1.41	7.13±1.46
Entire sample	4.89±2.87	5.33±2.35	6.17±2.60
Source of Variation	F Value	P Value	
Control/Experiment	.41	.532	
Test Time	5.98	.006	
Control/Experimental by time	2.45	.102	

<sup>1</sup>Means and Standard Deviation  
Survey scores 1-10 (1 being not confident, 10 being very confident)

## Appendix R: Table 20; Question number 8

Table 20

Mean Scores for Question 8: *I can resist eating even when I think others will be upset if I don't eat* at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

	Week 0	Week 4	Week 8
Control	5.60±3.47 <sup>1</sup>	6.70±3.02	6.60±2.63
Experimental	6.25±2.12	7.13±1.55	8.25±1.28
Entire sample	5.89±2.89	6.89±2.42	7.33±2.25
Source of Variation	F Value	P Value	
Control/Experiment	.70	.415	
Test Time	5.35	.010	
Control/Experimental by time	.98	.387	

<sup>1</sup>Means and Standard Deviation  
Survey scores 1-10 (1 being not confident, 10 being very confident)

## Appendix S: Table 21; Question number 9

Table 21

---

Mean Scores for Question 9: *I can resist eating when I feel uncomfortable* at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

---

	Week 0	Week 4	Week 8
Control	7.20 $\pm$ 2.86 <sup>1</sup>	7.60 $\pm$ 2.91	7.60 $\pm$ 2.55
Experimental	5.75 $\pm$ 2.49	6.63 $\pm$ 1.51	7.25 $\pm$ 1.83
Entire sample	6.56 $\pm$ 2.73	7.17 $\pm$ 2.38	7.44 $\pm$ 2.20
Source of Variation	F Value	P Value	
Control/Experiment	.74	.402	
Test Time	2.95	.067	
Control/Experimental by time	.96	.394	

---

<sup>1</sup>Means and Standard Deviation

Survey scores 1-10 (1 being not confident, 10 being very confident)

## Appendix T: Table 22; Question number 11

Table 22

Mean Scores for Question 11: *I can resist eating when there are many different kinds of food available* at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

	Week 0	Week 4	Week 8
Control	4.40 $\pm$ 2.46 <sup>1</sup>	5.30 $\pm$ 2.41	5.00 $\pm$ 2.16
Experimental	4.63 $\pm$ 2.20	5.63 $\pm$ 1.60	6.75 $\pm$ .886
Entire sample	4.50 $\pm$ 2.28	5.44 $\pm$ 2.04	5.78 $\pm$ 1.90
Source of Variation	F Value	P Value	
Control/Experiment	.85	.371	
Test Time	4.81	.015	
Control/Experimental by time	1.79	.183	

<sup>1</sup>Means and Standard Deviation

Survey scores 1-10 (1 being not confident, 10 being very confident)

## Appendix U: Table 23; Question number 12

Table 23

---

Mean Scores for Question 12: *I can resist eating even when I feel it's impolite to refuse a second helping* at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

---

	Week 0	Week 4	Week 8
Control	8.20±1.55 <sup>1</sup>	7.10±2.64	7.90±1.66
Experimental	6.25±1.91	6.88±1.25	7.88±.991
Entire sample	7.33±1.94	7.00±2.09	7.89±1.37
Source of Variation	F Value	P Value	
Control/Experiment	1.21	.287	
Test Time	2.13	.135	
Control/Experimental by time	2.74	.080	

---

<sup>1</sup>Means and Standard Deviation

Survey scores 1-10 (1 being not confident, 10 being very confident)

## Appendix V: Table 24; Question number 13

Table 24

---

Mean Scores for Question 13: *I can resist eating even when I have a headache* at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

---

	Week 0	Week 4	Week 8
Control	8.60±2.07 <sup>1</sup>	8.10±2.56	9.00±.943
Experimental	7.123±2.53	6.50±1.85	8.37±1.69
Entire sample	7.94±2.34	7.39±2.36	8.72±1.32
Source of Variation	F Value	P Value	
Control/Experiment	2.07	.169	
Test Time	7.42	.002	
Control/Experimental by time	1.07	.354	

---

<sup>1</sup>Means and Standard Deviation

Survey scores 1-10 (1 being not confident, 10 being very confident)

## Appendix W: Table 25; Question number 14

Table 25

---

Mean Scores for Question 14: *I can resist eating when I am reading* at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

---

	Week 0	Week 4	Week 8
Control	8.50±1.96 <sup>1</sup>	7.90±2.18	8.60±1.51
Experimental	7.38±2.56	7.75±1.49	8.625±1.06
Entire sample	8.00±2.25	7.83±1.86	8.61±1.29
Source of Variation	F Value	P Value	
Control/Experiment	.33	.573	
Test Time	1.87	.171	
Control/Experimental by time	.99	.383	

---

<sup>1</sup>Means and Standard Deviation

Survey scores 1-10 (1 being not confident, 10 being very confident)

## Appendix X: Table 26; Question number 15

Table 26

---

Mean Scores for Question 15: *I can resist eating when I'm angry (or irritable) at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures*

---

	Week 0	Week 4	Week 8
Control	6.50±3.31 <sup>1</sup>	6.40±3.20	6.90±2.69
Experimental	5.25±1.83	5.25±1.67	7.13±1.46
Entire sample	5.94±2.75	5.89±2.63	7.00±2.17
Source of Variation	F Value	P Value	
Control/Experiment	.40	.534	
Test Time	7.16	.003	
Control/Experimental by time	2.70	.083	

---

<sup>1</sup>Means and Standard Deviation

Survey scores 1-10 (1 being not confident, 10 being very confident)



## Appendix Y: Table 27; Question number 17

Table 27

Mean Scores for Question 17: *I can resist eating even when others are pressuring me to eat* at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

	Week 0	Week 4	Week 8
Control	5.80±2.16 <sup>1</sup>	6.30±2.54	7.00±2.16
Experimental	5.00±2.51	6.50±1.51	7.50±.926
Entire sample	5.44±2.83	6.39±2.09	7.22±1.70
Source of Variation	F Value	P Value	
Control/Experiment	.00	.972	
Test Time	7.61	.002	
Control/Experimental by time	1.03	.369	

<sup>1</sup>Means and Standard Deviation

Survey scores 1-10 (1 being not confident, 10 being very confident)

## Appendix Z: Table 28; Question number 18

Table 28

Mean Scores for Question 18: *I can resist eating when I am in pain* at Week Zero, Week Four, and Week Eight Analyzed by Two Way Analysis of Variance with Repeated Measures

	Week 0	Week 4	Week 8
Control	8.40±1.90 <sup>1</sup>	8.00±2.26	8.40±1.51
Experimental	6.88±2.03	7.00±2.07	8.38±1.30
Entire sample	7.72±2.05	7.56±2.18	8.39±1.38
Source of Variation	F Value	P Value	
Control/Experiment	1.15	.300	
Test Time	3.69	.036	
Control/Experimental by time	2.34	.112	

<sup>1</sup>Means and Standard Deviation

Survey scores 1-10 (1 being not confident, 10 being very confident)