THE EFFECTS OF WEIGHT REDUCTION PROGRAM ON WEIGHT LOSS AND SELF-EFFICACY

TRESA C. VIRANKABUTRA

A Thesis Submitted in Partial
Fulfillment of the Requirements
for the Degree of

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Department of Counseling Psychology

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TRESA C. VIRANKABUTRA

55 Pages MARCH 1998

This research was to study the effectiveness of the set-up Weight Reduction Program and to assess the effect of weight loss on self-efficacy and the effect of self-efficacy on weight maintenance.

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This quasi-experimental study tested whether a set-up program that included exercise, nutritional advice, and group support would affect weight loss. The study also looked at the effect of weight loss on self-efficacy, and the effect of self-efficacy on weight maintenance.

Sixty participants took part in the study. The t-test, frequency, and percentage were used to test the hypotheses. No significant differences were found.

Results indicated that Weight Reduction Program did not have a significant influence on weight loss, and weight loss did not affect self-efficacy. Also, self-efficacy did not affect weight maintenance. Discussion and recommendations concluded this thesis.

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CHAPTER I

INTRODUCTION

Background of the Problem

The National Health and Nutrition Examination Survey (NHANES III) shows that one in three US adults or 58 million people, between the ages of 20-74, are overweight and more than one in five children and adolescents aged 6-17 are overweight (MMWR Morbidity & Mortality Weekly Report, 1994). Other studies show that 12% of children between the age of 8-11 are overweight and that 2-5% are obese. This means that one child in every two will continue to be obese and become an obese adult. Television seems to play a significant role in obesity in childhood (Abraham & Llewellyn-Jones, 1992). There has been a steady increase in the number of overweight Americans in the past fifteen years (Troiano, Kuczmarski, Johnson, Flegal, & Campell, 1995). Americans are becoming more sedentary in their lifestyles. Forty percent of 18-65 year old adults are completely sedentary.

The Public Health Service had a primary exercise objective for regular and vigorous participation in physical activity by 60% of the American adult population by the year 1990 yet the nation fell far short of that objective (McAuley, 1991). Not only American but other parts of the world seem to be heading in the same direction due to globalization. The more technologically advanced a society becomes, it seems the less active it becomes. People must make an effort to stay active. There is a good amount of evidence to suggest that physical activity and exercise can result in meaningful health benefits, particularly in the area of weight control (Foreyt, 1987). Modern

environments tend to encourage sedentary lifestyles and less energy expenditure that would accompany physical work and getting from place to place.

Having an over abundance of food only adds to the problem. People are consuming more dietary fat than is necessary. We gain too much weight because we eat too much fat and get too little exercise. A study done on some 700 men and women, to study the relationship between normal fat intake, weight, and body fat, found that women who got less than 29% of their total calories from fat weighted on an average ten pounds less than women with high fat intake and the same thing applied to men (Pope, 1995). The prevalence of medical conditions associated to being overweight is staggering. Heart disease is the number one killer in America. In the United State, 1.5 million out the 2.1 million deaths in 1987 were related to dietary factors (Powter, 1993).

All of these factors added together led to the researcher's interest to set up a weight reduction program to see if exercise, nutritional knowledge and group support could have a positive effect on weight loss and weight maintenance.

Statement of the Problem

What is the impact of the Weight Reduction Program, that includes exercise, nutritional advice, and group support.

1. Does the set up program help individuals lose weight?
2. Does the set up program help individuals maintain their weight loss?
3. Does weight loss affect self-efficacy?
4. Does self-efficacy affect weight maintenance?

Objective of the Study

The goal of this study is to determine the effect of the Weight Reduction Program on weight loss and weight maintenance. Also, to assess the effect of weight loss on self-efficacy and the effect of self-efficacy on weight maintenance.

Significance of the Study

1. Considering the statistics on weight control, this study attempts to help the situation in some way. A program which includes exercise, nutritional advice, and group support could be the answer to some people who are bewildered by their condition and have no other place to turn to.
2. In an era of health consciousness, this study is one among many with a vision for a more enlightened and aware situation to food intake, exercise, group support, and the importance of one's self-efficacy.

Research Hypotheses

H1 : There is no significant difference in the mean weight of the experimental group after completion of the program and at the beginning of the program.

H2 : There is no significant difference in the mean weight of the control group at the conclusion and at the start of the program.

H3 : There is no significant difference in the experimental group's mean weight at the completion of the program and five weeks later.

H4 : There is no significant difference between the pre and post test self-efficacy mean scores for the experimental group.

H5 : There is no significant difference between the pre and post test self-efficacy mean scores for the control group.

H6 : There is no significant difference in the mean scores on self-efficacy of those

who gained weight after the five week follow up, and those who maintained their weight loss.

Definition of Terms

1. Weight Reduction Program refers to a four week, eight session program set up for this research study. It is comprised of three parts:
   a. Nutritional advice - this part of the program is made up of four one hour sessions covering all aspects of food intake such as calculation of calories and fat intake, carbohydrates, proteins, etc.
   b. Exercise - this part of the program is made up of eight 50 minute sessions of aerobic dance taught by qualified instructors.
   c. Group Support - is comprised of four one hour sessions in discussing issues of concern of the participants.
2. Self-efficacy refers to scores obtained from the General Self-efficacy Scale indicating an individual's belief in their capability to perform a specific action required to obtain a desired outcome.
3. Five Week Follow up refers to a follow up session five weeks after the completion of the Weight Reduction Program.

Limitation of the Study

1. Due to time limitation and financial concerns, the program was limited to a four week program, and only one follow up session.
2. Age, nationality, gender, socioeconomic status will not be focused on in this study due to the small sample size.
3. Due to time commitment required from the participants of this research project, randomization was not employed.

4. The participants filled out all the forms utilized in this study as they applied to them.

CHAPTER II

LITERATURE REVIEW

This chapter will introduce the theoretical background for Weight Reduction Program, the conceptual model used as a research guidepost, and relevant literature on weight issues.

Theoretical Backgrounds

The theoretical background will discuss three parts of Weight Reduction Program used in this study. They are; nutrition, exercise, and group support. The relationship between self-efficacy and weight maintenance will also be discussed.

Nutrition

Food is a basic need of humans. We need the calories and nutrients supplied by food. It is essential for life. Cells are the main employers of nutrients. Cells are the building blocks of tissue, organs and systems. Food can affect the environment of cells and their ability to function in a normal way. We have an adaptive mechanism for managing fluctuations in nutrient intake. For example, if we starve or diet, the body will adapt by decreasing supply by lowering energy expenditure. This will decrease the body's need for calories. If the calorie intake exceeds the needed energy then it will get stored as fat to be used in later energy needs. Some nutrients can be manufactured by the body and they are called nonessential ones such as cholesterol, glucose, etc. There are other nutrients the body cannot make and these are called essential nutrients (Brown, 1995).

There are six categories of these nutrients as are follows;

Carbohydrates consist of three types of chemical substances. They are a major source of energy and supply four calories per gram. They tend to dominate at least 50% of the total daily calorie intake. An average person needs about 50 grams per day.

Proteins are essential structural components of all living matter. Protein is the most important of all the essential nutrients. Proteins provide building materials for body tissue (muscles, enzymes, hormones, connective tissue, antibodies, red blood cells). Healthy adults need about 45 grams daily. Proteins provide four calories per gram of energy. Amino acids are the building blocks of protein. When protein is consumed in food , it is broken down by digestive enzymes and absorbed into the blood stream as amino acids which make protein when linked together, High quality proteins contain all the essential amino acids in the amounts needed to support protein tissue. If some essential amino acids are missing then the remaining ones will be used as a source of energy or will be converted to fat and stored. They can't be stored very long, so food that provides a sufficient amount of protein needs to be eaten.

Fats are a group of substances found in food that won't dissolve in water but will dissolve in fat. Fat supplies energy and fat soluble nutrients and increases the flavor and palatability of food. They provide sustained relief from hunger and serve as a component of cell membranes. Energy is stored in the body mostly in the form of fat. Fat is needed in the diet. It supplies essential fatty acids which are essential for growth and is not produced by the body. Fats remain in the stomach over a period of time and are absorbed slowly. There are two sources of fat; those consumed in diet and fat produced from carbohydrates and proteins. There are three main types of fatty acids: saturated, monounsaturated, and polyunsaturated. Saturated fats are mainly found in

foods of animal origin. Monounsaturated and polyunsaturated are mainly found in foods of plant origin and some seafood. Total fat intake should be limited to 30% or less of total calories. Cholesterol is like a cousin of fat. Both belong to a larger family of chemical compounds called lipids. Cholesterol is a chemical compound manufactured in the body. It is used to build cell membranes and brain and nerve tissues. Cholesterol doesn't need to be part of the diet because the body can make enough. Yet, people tend to consume too much. Foods of animal origin contain cholesterol. The recommended total blood cholesterol should be kept below 200 mg/dl. Cholesterol intake should not exceed 300 mg. per day (Brown, 1995).

Vitamins are chemical substances that perform specific functions in the body. There are thirteen of them. They come in two basic types, water soluble and those that dissolve in fat. Vitamins play a critical role in regulating chemical reactions in the body that convert proteins, carbohydrates, and fats into energy the body can use. They are involved in reactions that build body tissue. They help to maintain the health and proper functioning of existing tissue too. Fruit and vegetables are a good source of vitamins.

Minerals serve as components of body structures. They also play key roles in the conduct of the body processes. The body contains 40 or more but only 15 are essential parts of our diet. Minerals consist of single atoms and due to not having an equal number of proton as electrons, they tend to carry a charge. This charge makes minerals reactive. This charge allows minerals to combine with minerals of the opposite charge and form compounds that become part of bone, teeth, cartilage, and other tissue. Due to minerals tending to be reactive, they may combine with other substances in food

and form highly stable compounds that are not easily absorbed. For this reason, you may not get what you eat. Some examples of minerals are calcium, iron, and sodium.

Water is the largest single component of our diet and body. Water plays a key role in energy formation and in carrying nutrients to cells and waste products away from them. We need enough water each day to replace water lost. Approximately ten cups of water per day are needed, depending on climate and physical exertion of the person.

Healthy diets are made up of a variety of different foods that together provide calories and nutrients in the right amount to help the body function at its optimal level. A healthy diet would also provide the right balance of carbohydrates, fats, and proteins to reduce the risk of chronic disease and are a part of a full and productive lifestyle. A good adequate diet would include foods that are good sources of a number of nutrients but are not packed with calories. A set of guidelines have been put into place in some countries to help people improve upon their diets. Also there are recommendations for the selection of foods that can lead to healthy diets. Each Country's recommendation will address priority health problems that can be improved by dietary change.

Exercise

An important part of any effective weight loss and weight maintenance program is *regular physical activity. Exercise builds muscle tissue and muscle cells burn more calories while you are resting than do fat cells. Exercise helps retain muscle mass* during dieting and it burns fat. After a moderate workout, carbohydrate energy reserves are taken from the muscles so then the muscles will begin burning fat stores.

Exercise helps to reduce appetite. Insulin is able to get glucose into the cells more efficiently. Due to increases in metabolic rate, weight loss and weight maintenance is easier. Body weight is regulated by the number of calories used through physical activity with the calories eaten helps to achieve desired weight loss. If fewer calories are eaten than is needed, the body will use the stored calories and this leads to weight loss. It takes approximately 3,500 calories to produce one pound of body weight. To lose one pound weekly, 500 calories need to be omitted.

Exercise can be divided into two types; anaerobic and aerobic. Anaerobic exercise uses large groups of muscles very strenuously for short periods of time, yet does not burn lots of calories. At the same time though, anaerobic exercise does result in increased muscle mass which increases metabolic rate. An example of anaerobic exercise is weight lifting.

Aerobic exercise, on the other hand, makes a person breathe hard and use large muscle groups at a regular even pace. It increases calorie requirement significantly and can lead to a mild build up of muscle mass which increases resting metabolic rate. Aerobic exercise to music can burn up a 100 calories in 20 minutes. To get the most benefit from aerobic activity , exercise should be at a level strenuous enough to raise heart rate to a target zone. A person's target heart rate zone is 50 to 75 percent of their maximum heart rate. A person can see if they are within their target rate zone by counting the number of pulse beats, at the wrist or neck, for 15 seconds then multiply by four to get the beats per minute. They can then refer to a chart like the one shown as follows.*

Age	Target Heart Rate Zone	Average Max. Health (pounds)
20-30 yr.	98-146 beats per min.	195
31-40 yr.	93-138 beats per min.	185
41-50 yr.	88-131 beats per min.	175
51-60 yr.	83-123 beats per min.	165
61 +	78-116 beats per min.	155

*Source: Weight Control Information Network, 1997

Examples of aerobic exercise are brisk walking, jogging, bicycling, swimming, racket sports, and aerobic dancing. It is recommended that a person exercise 20-30 minutes of aerobic activity three or more times a week.

Exercise is best combined with a good diet. If exercise is combined with a moderate decrease in usual caloric intake, it helps people lose fat, build muscle mass and become physically fit. Regular exercise has a tendency to decrease appetite. Learning to balance calorie use through physical activity with the calories eaten helps to achieve desired weight loss. If fewer calories are eaten than is needed, the body will use the stored calories and this leads to weight loss.

Group Support

A group is a fundamental component in a person's social life. Crucial characteristics of a group are: interaction, structure, size, goals, unity, and temporal change. Yet Kurt Lewin said the size, structure, or activities of a group didn't matter because all groups are based on interdependence among it members (Johnson & Johnson, 1994). Groups influence one another's behavior by interaction. If a group proves to be cohesive then a person will experience heightened self-esteem because the group provides a source of security and protection.

Groups offer a place for affiliation. They offer a place to communicate and to seek social approval. Groups allow for a person to be open and positive in relationships. Groups offer a place where a person can be accepted and liked due to others experiencing a similar situation. A person can share their feelings in a secure setting. They are able to explore their feeling and attitudes, at the same time feel they are being understood. When a person perceives that others are concerned with an event they are going through, this can help the person through the event because they perceive that they are cared for, valued, and liked. Group support offers many advantages. A group is easier to join and leave than if a person is seeing an individual therapist. Groups tend to exert a dynamic effect, thereby helping the person deal with the psychological and social pressures that could cause them to relapse. Group support can help a person feel that they are mainly responsible for changing their behavior due to their own efforts and not due to someone else. Groups offer a chance to make friends whom a person can call when going through a rough spot.

The overall rewards of groups are a place of social exchange, a place to gain valued rewards while incurring the fewest possible costs, feeling a sense of unity, and receiving help to overcome a situation that would otherwise overwhelm the person. Group support is a form of social support that can prove very beneficial to people in stressful events. Group support can help an individual explore the obstacles standing in their way of changing the necessary lifestyle behaviors leading to weight control.

Support from peer groups can prove highly successful for those trying to lose weight. Eating is frequently associated to emotional or social situations and is not related to hunger. A group can help a person analyze their eating behaviors. Peer support can aid in long term maintenance strategy. Group support allows for a person

to share their preoccupation with weight issues. Baron (1995) suggests that essential components for any successful weight loss program includes social support.

In conclusion, group support is a multifaceted concept as stated in Johnson et al. (1994). It can be beneficial to a person's psychological and physical health. It is comprised of different components such as emotional support, appraisal support, informational support, and instrumental support.

Relationship between Self-efficacy and Weight Maintenance

Self-efficacy is one core aspect of Albert Bandura's Social Cognitive theory. Self-efficacy is the belief that one can execute specific action to produce desired outcome. People possess beliefs that enable them to exercise a measure of control over what they think, feel, and act. People have self-regulatory mechanisms that provide the potential for self-directed change with the ability to influence their behavior. Self-efficacy is one of the most influential arbitrators in human agency. It plays a role in determining the choices people make, the effort they will expend, and how long they will persevere in the face of challenge and the degree of anxiety or confidence they will bring to the task at hand. A person's perceived self-efficacy helps explain why people's behavior differs even when they have similar knowledge and skills. This ability is influenced by the subprocesses of self-observation, judgment, and self-reaction.

Self-efficacy influences behavior in four ways: choice of behavior, persistence, influencing thought patterns and emotional reaction, and the quality of performance. People will be more inclined to engage in a task in which they feel competent. They will avoid those tasks where there is a lack of confidence. A person will persevere and expend much effort if they believe in themselves. The higher their sense of efficacy, the greater the effort expenditure and persistence. Self-beliefs tend to create a self-

fulfilling prophecy. When a person has a high sense of self-efficacy, they will persevere which will likely increase performance, which in turn, helps to raise a sense of self-efficacy.

Self-beliefs influence human agency by influencing thought patterns and emotional reaction. People with a high sense of self-efficacy may feel confidence and serenity in approaching difficult tasks. Whereas, if their efficacy is low, they may feel things are tougher than what they actually are, which can cause stress and prohibit a person from gaining a better picture of how to deal with the problem.

Finally, self-beliefs affect the quality of performance. Self-confidence breeds success which in turn breeds more challenging performance. When a person doesn't believe in themselves they will be hesitant, feel like a failure, and feel defeated.

Sources of perceived self-efficacy are: mastery experiences, vicarious experiences, social persuasion, and physiological state. Mastery experiences can raise efficacy beliefs. Success breeds success. In terms of vicarious experiences, a person will feel they can succeed at it if someone else can. If he can do it then so can I. Modeling offers a chance to learn from others. Social persuasion affects a person's performance evaluation. Also verbal persuasion can provide efficacy information.

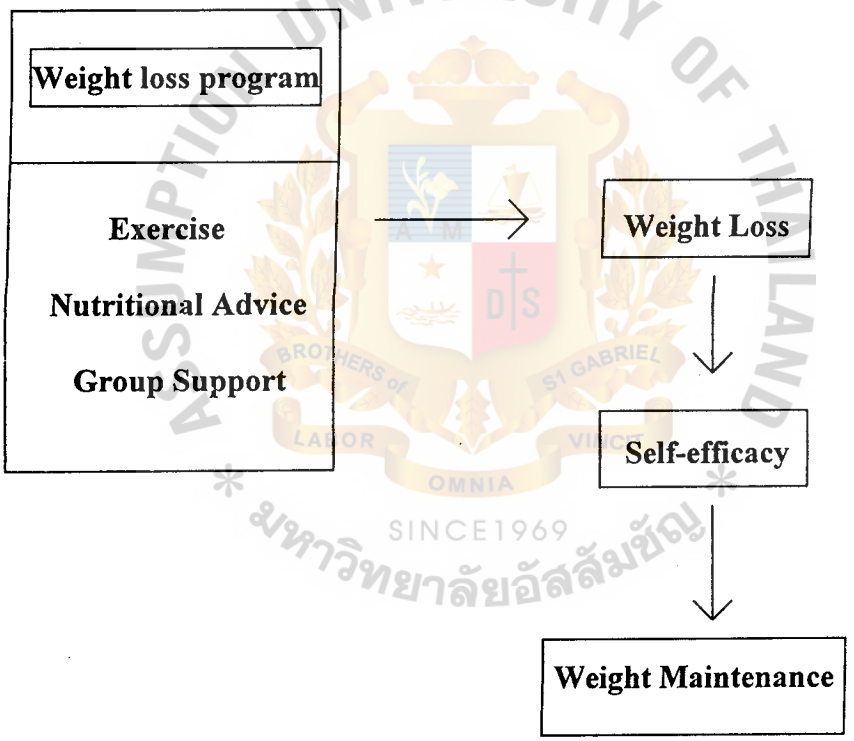
Clark, Abrams, & Niaura, (1991) said that self-efficacy has been positively linked to behavioral change and maintenance of change in many diet and exercise studies. It is believed that self-efficacy can enhance or impede the motivation to act. People who have high self-efficacy will take the action necessary to solve a problem. At the same time, these same people will be more inclined to stay committed until the desired goal is reached.

CONCEPTUAL MODEL

Based on the theoretical background, this led to the following conceptual model for this research study as shown in Figure 1.

Figure 1

Conceptual Model



Relevant Literature

Relevant literature on weight issues will cover diet, exercise, and group support. Also, the relationship between self-efficacy and exercise, and nutrition will be discussed.

Pritchard, Nowson, & Wark (1997) conducted a study on overweight men and randomly assigned them to one of three groups: diet, exercise, or control groups. One group reduced dietary fat but kept their activity unchanged. The second group self-selected aerobic exercise (three times a week) but kept diet unchanged. The control group maintained weight.

Results showed a mean weight loss of 6.4 +/- 3.3 kg. for the dieters, a mean weight loss of 2.6 +/- 3.0 kg. for the exercisers, and the control group maintained their weight. Yet 40% of dieters' weight loss was lean tissue but over 80% of exercisers' weight loss was fat. This meant it was better to lose weight through exercise even though at a slower pace.

Garrow & Summerbell (1995) did a study to determine if physical training conserves fat-free mass in overweight men or women during weight loss. They studied journals published between 1966 and 1993. They found reported results on 226 sedentary men, 233 exercising men, 199 sedentary women, and 258 exercising women. The results showed that men who performed aerobic exercise without dietary restriction were able to lose 3 kg. in 30 weeks when compared to sedentary controls. For women, a weight loss of 1.4 kg. in 12 weeks was obtained. They concluded their study by saying aerobic exercise can cause modest loss in weight without dieting.

Kaxman, et, al (1990) cite a study that showed that 90% of women in a weight program, who lost and maintained at least 20% of their body weight, exercised at least three times a week. Exercise also seemed to help in weight maintenance.

Miller, Koceja, & Hamiliton (1997) studied the therapeutic effectiveness of diet, exercise, and diet plus exercise for weight loss in obesity. They reviewed all research that included humans reported in English and published in scientific journals within the past 25 years. They found that weight loss through diet was 10.7 +/- 0.5 kg., weight loss through exercise was 2.9 +/- 0.4 kg. and weight loss through diet plus exercise was 11.0 +/- 0.6 kg.

At a one year follow up, diet plus exercise showed to be a superior combination for weight loss.

Skender, Goodrick, Del Junco, Reeves, Darnell, Gotto, & Foreyt (1996) conducted a comparison of the effects of three cognitive-behavioral weight control interventions: diet only, exercise only, diet and exercise over a period of two years. A total of 127 men and women at least 14 kg. overweight were studied. Dietary intervention was a low-energy eating plan adjusted to produce 1 kg./per week of weight loss. Exercise included walking and an exercise program for five periods per week. Twelve weekly instructional sessions followed by three biweekly and eight monthly meetings took place.

At the end of one year, the diet group lost 6.8 kg. and the exercise group lost 2.9 kg. However, the group that combined diet and exercise produced 8.9 kg. of weight loss. In the second year, when comparing all three groups, the diet group regained the most weight whereas the exercise group showed better maintenance. A combination of exercise and diet would seem to produce the best overall results.

Wadden and Frey (1997) conducted a study to evaluate long term efficacy of a proprietary weight loss program. Six hundred and twenty-one people who had completed a 26 week weight loss program, which included 12 weeks of treatment by a very low calorie diet, were used.

It was found that a program of lifestyle modification, in combination with brief use of a very low calorie diet, showed successful weight control even several years after treatment. That is, at a three year follow up, 53% of the sample had maintained losses of 5% or more and 35% losses of 10% or more.

Wadden (1993) found that people who were treated under medical supervision using a very low-calorie diet lost approximately 20 kg. in 12 to 16 weeks and maintained ½ to 2/3 of this loss in the following year.

Patients who were treated using a conventional 1200 kcal/d reducing diet, combined with behavior modification, were able to lose approximately 8.5 kg. in 20 weeks. They were able to maintain approximately 2/3 of this loss one year later.

He concluded that people who participated in a formal weight loss maintenance program, exercised regularly, or did both, were likely to show the best long-term results.

Foreyt (1987) cites several studies in his paper that shows exercise plays a significant positive role both in increasing weight loss during treatment and in the maintenance of lost weight. He goes on to say that 85% of men and 78% of women who participated in an obesity treatment program reported that increased exercise was an important factor in their weight maintenance.

Schwarzes and Fuchs, (cited in Conner & Norman 1995), discussed the interplay between self-efficacy, outcome expectancies and risk perceptions. They analyzed 800 citizens of Berlin, Germany. One interesting aspect of their study was, that women who believed they could persist eating healthy foods, consumed less fat and cholesterol and ate more fruits and vegetables than those who did not share this belief. Self-efficacy was the best predictor in the data set for women. They go on to state that theoretical approaches to the adoption and maintenance of health behaviors should

include distinct stages of motivation and volition along with the construct of self-efficacy. Self-efficacy seemed to have turned out to be the most powerful single resource factor.

Schwarzes and Fuchs go on to say that dieting and weight control are health related behaviors. They feel these behaviors can be governed by self-efficacy beliefs. They cite a study (see Chambliss and Murray, 1979) that found overweight individuals were most responsive to behavioral treatment where they had a high sense of efficacy and an internal locus of control. They cite other studies that show self-efficacy operates best in concert with general life style changes, including physical exercise and the provision of social support.

Bartlett (1995) did a study to determine the psychological effects of a regular supervised exercise program in dieting women. Fifty-one overweight women were divided into four groups: diet alone, diet plus aerobic exercise, diet plus resistance exercise, and diet plus combined exercise. The women were studied for 24 weeks. All participants across the four groups lost an average of 19.3$/pm$6.4 kg. Yet one interesting aspect of the study was, that there was an increase in self-esteem and self-efficacy.

Rash (1995) studied whether participation in an exercise program would alter perceived health locus of control and perceived self-efficacy. Her subjects were 65 college students. The components of the exercise program included aerobic exercise, strength training, and flexibility. Each session was composed of one and one -half hours three times a week for 16 weeks.

Results indicated that participation in the exercise program did not alter a subject's perceived self-efficacy though it did have some impact on participant's locus of control.

McAuley (1992) did a four month follow up study, after the completion of an exercise program of previous sedentary middle aged adults. He wanted to examine the role played by physiological behavior and psychological variables in the maintenance of exercise..

His findings showed that self-efficacy predicted exercise behavior over the four month follow up period. He felt the findings supported the reciprocally determining nature of efficacy cognition and mastery behavior. He concluded by stating the study seemed to implicate exercise self-efficacy as a significant cognitive mediator in the maintenance of exercise behavior.

McAuley (1991) set up a program to examine the role self-efficacy cognition plays in adopting and maintaining exercise behaviors of sedentary middle-aged adults. A total of 103 adults participated in the program for a duration of five months, (twenty weeks). Participants did low-impact aerobic exercise three times a week for 15-20 minutes each time. McAuley was looking at specific and general efficacy. He felt specific efficacy would have a direct and indirect effect on exercise frequency. He proposed that general efficacy would have an effect on exercise only during the initial stages (first 12 weeks) of the exercise adoption.

McAuley found that self-efficacy is a significant predictor of frequency in the early stages of exercise participation but later, when exercise becomes more of a habit, efficacy cognition, in terms of barriers to participation, ceased to play such an important role.

Holloway, Beuter, & Duda (1988) talk about a study that was done to investigate the effects of strength training in adolescent girls on general levels of self-efficacy. Subjects who engaged in weight training experienced significant improvements in general levels of self-efficacy.

Walcott-McQuigg (1995) say that self-efficacy has been positively linked to behavioral change and maintenance of change in many diet and exercise studies. It's been found that women with higher levels of diet and exercise efficacy engage in more weight control behavior.

DePue, Clark, Medeiros, & Pera (1995) said social support is an essential component of any successful weight loss program. It was found, in a study to identify facilitators and obstacles to weight loss maintenance, that those individuals who were able to maintain their weight reported engaging in regular aerobic exercise, attending a maintenance support group, and having confidence in their ability. Regainers reported stress and motivation as frequent weight management obstacles. Yet, respondents of the study consistently identified the need for low/no cost ongoing support.

Parham (1993) says that social support has been demonstrated to correlate directly with weight loss maintenance. He goes on to say that the potential value and minimal risk of improving social support justifies continued attention to the part of weight management programs.

D'Eramo-Melkus & Hagan (1991) says behavior therapy and group support appear to be enabling factors that go beyond knowledge to facilitate behavior change and later changes in health related indexes.

Baron-Faust (1997) says social support offers positive effects by helping the individual counter social and psychological pressure to overeat. He suggests bringing people together who are experiencing a similar problem in a controlled setting, will allow them to learn better ways of functioning, at the same time, observe how they interact with each other.

CHAPTER III

THE RESEARCH METHODOLOGY

This chapter describes the materials and methodology used in this research. The Research Design, Research Sample and Procedure, Instrumentation, and method of Data Analysis are discussed.

Research Design

This study is a Quasi-experimental with a pre and post-test design. One non participating control group and one participating experimental group took part in this research. Weight Reduction Program was the independent variable and weight loss was the dependent variable. The pre test/post-test design allowed for the determination of the effect of the program on weight loss.

Research Sample and Procedure

The participants consisted of 60 people between the ages of 14 to 57. The Weight Reduction Program was advertised through the local English language newspaper and through flyers posted in various areas around Bangkok. Prospective participants indicated their interest in participation via telephone or in person. These people were given more detailed information concerning the program.

In response to the advertisement and flyers, a total of 66 individuals showed an interest. The only criteria for inclusion was a time commitment to engage in the program's activities which included eight sessions of exercise, four sessions of nutritional advise, four sessions of group discussions, and , one follow up session five weeks after the end of the program.

Thirty -six participants, who consented to the time commitment, were assigned to the experimental group. Thirty participants, who could not commit themselves to the time required, agreed to partial involvement in the program by filling out questionnaires utilized in the study and weighing in every week for four weeks. In other words, they served as a control group.

Ethical consideration was taken into account with this research project. All participants were informed of their right to withdraw from the program anytime they so desired without any penalty.

Of the thirty-six people who started the program as the experimental group, six dropped out within the first week due to personal reasons. As a result, 30 participants completed the program.

Demographic data of the participants in the experimental and control groups are presented in Tables 1, 2, 3, and 4 respectively.

Table 1

Age Range of the Experimental and Control Groups

	Experimental Group		Control Group	
Age Range	%	n	%	n
14-25	30	9	23.33	7
26-35	23.33	7	33.33	10
36-45	20	6	26.67	8
46-55	26.67	8	16.67	5

Table 1 shows the age range of the experimental and control groups. The majority of participants in the experimental group fell between the age range of 14 to 25 (30%), while the majority of participants in the control group fell between the age range of 26 to 35 (33.33%).

Table 2

Employment Status of the Experimental and Control Groups

	Experimental Group		Control Group	
Employment Status	%	n	%	n
Homemaker	23	7	23	7
Employed	33	10	67	20
Unemployed	17	5	3	1
Volunteer Work	27	8	7	2

Table 2 shows that seven people of the experimental group are homemakers, a total of 23 percent. Ten people are employed, a total of 33 percent. Five people are unemployed, a total of 17 percent. Eight people did volunteer charity work that took them out of the home often enough not to be considered homemakers yet at the same time, they did not receive money for their job. They made up a total of 27 percent. We can also see from Table 2, that the majority of the control group are employed, a total of 67 percent. Seven participants are homemakers and one is unemployed. Two

participants are listed in volunteer work, which means they do full time volunteer charity work without pay.

Table 3

Income Status of the Experimental and Control Groups

	Experimental Group		Control Group	
Income	%	n	%	n
Less than $20,000	50	15	40	12
$20,000 - $24,999	10	3	7	2
$25,000 - $34,999	13.33	4	13	4
$35,000 - $49,999	13.33	4	7	2
$50,000 or more	13.33	4	33	10

Table 3 shows a total of 15 people, 50% of the experimental group, made less than 20,000 U.S. dollars a year. Three, 10% of them, made between 20,000-24,999 U.S. dollars a year. Four of them, 13.33%, made between 25,000 - 34,999 U.S. dollars a year. Four of them, 13.33% made between 35,000-49,999 U.S. dollars a year, and four of them, 13.33% made 50,000 U.S. dollars a year or more. We can also see that the majority of participants of the control group, 40%, made less than 20,000 U.S. dollars a year. The second largest group, 33% falls in the 50,000 U.S. dollars or more bracket. Thirteen percent of the participants fall in the 25,000-34,999 U.S. dollars bracket. Seven percent of the participants make 20,000-24,999 U.S. dollars a year and seven percent made 35,000-49,999 U.S. dollars a year.

Table 4

Nationality of the Experimental and Control Groups

	Experimental Group		Control Group	
Nationality	%	n	%	n
American	47	14	27	8
Thai	20	6	43	13
Mexican	7	2	3.3	1
Burmese	3.3	1	2	7
Filipino	-	-	7	2
Indian	3.3	1	-	-
Japanese	3.3	1	-	-
Canadian	3.3	1	3.3	1
Portuguese	3.3	1	-	-
Venezuelan	3.3	1	-	-
Hungarian	3.3	1	-	-
Singaporean	-	-	3.3	1
African	-	-	3.3	1
British	3.3	1	3.3	1
Total	100	30	100	30

Table 4 shows that 47% of the experimental group is American. The second highest group of participants are Thai, a total of 20%. The third highest group is Mexican, a total of 7%. The eight other nationality groups all share equal numbers, a total of 3.3% each. Table 4 also shows that the majority of the control participants are Thai, a total of 43 percent. The second largest group American with 27 percent. Filipinos were the third largest group. Five nationalities , African, British, Canadian, Mexican, and Singaporean, made up 3.3 percent each and the last group was Burmese with 2 percent.

Program Schedule for the Experimental Group

The experimental group had two sessions a week, two hours each session, every Tuesday and Thursday night, from 6:00 to 8:00 p.m. for four weeks. Details of each week are as follows:

Week I

Session 1

A folder was handed out to each participant. It contained a Demographic Data Form, General Self-efficacy Scale, Self report of Exercise Habits and Nutritional Knowledge, and Week I Food Intake Chart. Participants were asked to fill out the Demographic Data Form, General Self-efficacy Scale, Self report on exercise habits and nutritional knowledge. All of these forms were handed in to the researcher.

During group discussion, Week I Food Intake Chart was explained and participants were asked to record their food consumption during the week. Participants were also invited to share their concerns. Issues arose concerning the lack of ability, on the participants part, to control food intake. The discussion involved sharing some techniques to help participants control their food intake. For example, eat only at a specific place, put utensils down between bites, use small plates, stop

eating when full, leave the table when finished eating, and, do something active after a meal.

Issues also arose concerning body image and the part the media plays in these issues. The researcher shared some statistics on how concerns about body image affects the way people eat and behave. Afterwards, participants weighed in and their weight was recorded by the researcher.

Participants then did 50 minutes of aerobic dance. The session ended.

Session 2

The researcher introduced Dr. Nithat Sirichatiratana, a preventive care specialist, from Bangkok Adventist Hospital and he led a one hour talk on nutrition. Topics discussed were cholesterol intake, calories, importance of fruits and vegetables, Mediterranean diet Vs American diet, the four food groups, fat intake, and many others. Participants were invited to bring up any concerns or questions they had regarding calorie intake. Questions were dealt with systematically.

The participants then did 50 minutes of aerobic dance. The session ended.

Week II

Session 3 :

Participants weighed in and the researcher recorded their weights. Participants requested the exercise be switched to the first hour of the session. This due to the reason that they felt more alert after exercise and also could rest during the discussion time. Thus, participants did 50 minutes of aerobic dance first.

During the next hour of group discussion, Week I Food Intake Charts were looked at and discussed. Participants were invited to bring up any concerns or issues. The main discussion involved issues concerning snacking. Several techniques were shared by the group as a means of helping to control snacking. Examples of these techniques

were: don't snack alone, freeze restricted snack foods, keep healthy snacks handy, try not to snack in the car, stay away from finger foods, and don't associate snacking with relaxation.

Issues also arose concerning the prevalence of obesity. The discussion involved how obesity affects the younger generation. Week II Food Intake Chart was passed out and participants were asked to record their food intake for the week. The session ended.

Session 4

Participants did 50 minutes of aerobic dance. The second hour, Dr. Nithat showed a video on the prevalence of heart disease and its relationship to diet. The floor was then opened for discussion. The session ended.

Week III

Session 5

Participants weighed in and the researcher recorded their weight. They then had 50 minutes of aerobic dance. During the second hour of group discussion, Week II Food Intake Charts, of the participants, were looked at and discussed. Participants were invited to bring up any issues or concerns and these were discussed. Issues arose concerning eating out. Some techniques were shared in the group as a way of helping deal with dining out. Examples of these techniques were: plan ahead what to order, cut back on an earlier meal if a big meal is expected later, avoid high calorie drinks and desserts when eating out, and stay away from 'extras' attached to a meal.

Issues also arose concerning the part emotions play in being overweight such as low self-esteem, anxiety, stress and demotivation. Participants shared their personal experiences. Week III Food Intake Chart was passes around and participants were asked to record their food intake for the week. The session ended.

Session 6

Participants did 50 minutes of aerobic dance. Dr. Nithat then led a one hour discussion on nutritional advice. He talked about stress management and weight maintenance. He discussed different types of relaxation techniques. The floor was opened for discussion. The session ended.

Week IV

Session 7

Participants weighed in and their weights were recorded by the researcher. Participants then did 50 minutes of aerobic dance. The second hour was taken up with group discussion. Week III Food Intake Charts were looked at. Participants were invited to bring up any concerns or issues. Issues arose concerning the lack of low fat and sugar free foods in Thailand thus the participants felt limited in the foods they could eat. Week IV Food Intake Chart was passed around and participants were encouraged to record their food intake for the week. The session ended.

Session 8

Participants did 50 minutes of aerobic dance. Dr. Nithat did a 45 minute wrap up of the nutritional advice given the three previous weeks plus touching on the importance of exercise in relationship to weight maintenance. The floor was opened for discussion. Participants were asked to complete the General Self-efficacy Scale. A data was set for the follow up session five weeks later. The researcher brought the program to a close.

Five Week Later Follow up Session:

Participants in the experimental group met for the first time since the closing of the program. They weighed in, then were asked to fill out a self-report rating on nutritional knowledge and exercise. Discussion centered around what they found hard

about losing and maintaining their weight. The researcher brought the program to a conclusion. Participants were thanked for their participation in the program and encouraged to continue putting into effect their lifestyle patterns.

Program Schedule for the Control Group

At the beginning of the program, participants in the control group were asked to complete individually a Demographic Data Form and a General Self-efficacy Scale. Subjects were asked to record their weight for four consecutive weeks. This data was collected on a weekly basis by the researcher via telephone or in person. At the end of four weeks, another Self-efficacy Scale was distributed to each participant and collected by the researcher.

Instrumentation

The following instruments were utilized.

Demographic Data Form

This form was constructed for the purpose of this research to elicit information regarding participants age, employment status, occupation, income, and nationality. A copy of this form can be found in Appendix A.

The General Self-efficacy Scale

Permission was granted by Ralf Schwarzer, the author, to use the General Self-efficacy Scale in this research study (see Appendix B for the researcher's request and the author's permission). Internal consistencies of the General Self-efficacy Scale reported by several studies yielded between .75 - .90 (Schwarzer et al, 1995).

The General Self-efficacy Scale is composed of 10 items. Participants were asked to rate each item, ranging from (1) not at all true to (4) exactly true. Scores could range from 10 to 40. The higher the score, the higher the general self-efficacy. A copy of this instrument can be found in Appendix C.

Self Report on Exercise Habits and Nutritional Knowledge

This rating was constructed for the purpose of this research to determine the experimental group's exercise habits and nutritional knowledge at the beginning of the program and at the follow up session. See Appendix D.

A Four Week Weight Chart

This chart was developed for the purpose of this study to record weekly weights of the control and experimental groups (see Appendix E).

A Weekly Food Intake Chart

This chart was developed for this program to access weekly food comsumption of the experimental group and to help participants gain a greater awareness of their eating patterns. A copy of this Chart can be found in Appendix F.

Data Analysis

The t test was used to test the hypotheses. Self - Report on Exercise and nutritional knowledge was analyzed by frequency, mean, standard deviation, and percentage.

CHAPTER IV

FINDINGS

This chapter presents the findings of this research study. The findings will be presented respectively of the hypotheses. Additional findings will also be presented.

Hypothesis 1

There is no significant difference in the mean weight of the experimental group after the completion of the program and the beginning of the program.

Results

No significant difference was found between the mean weight of the experimental group, at the completion of the program and at the beginning of the program (see Table 5).

Table 5

Mean Weights of the Experimental Group

Week 1 Weight (lbs)			Week 4 Weight (lbs)		
Range	M	SD	Range	M	SD
86-199	146.1	31.35	89-198	144.3	29.96

n= 30, t = .2336, p>.05

Table 5 shows there was no significant differences between the mean weights of the experimental group at week one and week four.

Hypothesis 2

There is no significant difference in the mean weight of the control group at the conclusion and the start of the program.

Results

It was found that there was no significant difference between the mean weight of the control group at the start of the program and at the conclusion of the program (see Table 6).

Mean Weight of the Control Group

Week 1 Weight (lbs)			Week 4 Weight (lbs)		
Range	M	SD	Range	M	SD
73-200	128.70	25.92	72-201	129.24	26.80

n=30, t=-.079, p>.05

Table 6 shows there was no significant difference found between the mean weight of the control group at week 1 and week 4.

Hypothesis 3

There is no significant difference in the experimental group's mean weight at the completion of the program and five weeks later.

Results

There was no significant difference found between the mean weight, at the completion of the program and the mean weight at the five week follow up, of the experimental group (see Table 7).

Table 7

The Mean Weights of Week Four and the Follow up of the Experimental Group

Week 4 Weight (lbs)			Follow up Weight (lbs)		
Range	M	SD	Range	M	SD
89-198	144.25	29.96	96-199	145	28.92

n = 30, t=.009, p>.05

Table 7 shows there was no significant differences between the mean weights of the experimental group at week 4he experimental group at week 4 and the follow up.

Hypothesis 4

There is no significant difference between the pre and post test Self-efficacy mean scores for the experimental group.

Results

There is no significant difference found between the pre and post test self-efficacy mean scores for the experimental group (see Table 8).

Table 8

Mean Self-efficacy Scores for the Experimental Group

	Pre test			Post test	
Range	M	SD	Range	M	SD
14-40	29.83	6.12	19-40	30.4	5.70

n = 30, t = -.372, p> .05

Table 8 shows there was no significant difference between the pre and post test self-efficacy mean scores for the experimental group.

Hypothesis 5

There is no significant difference between the pre and post test self-efficacy mean scores for the control group.

Results

There is no significant difference found between the pre and post test self-efficacy mean scores of the control group (see Table 9).

Table 9

Mean Self-efficacy Scores of the Control Group

	Pre Test			Post Test	
Range	M	SD	Range	M	SD
21-38	30.63	4.50	23-40	31.13	4.23

n = 30, t = -.444, p>.05

Table 9 shows there was no significant differences between the pre/post test self-efficacy score for the control group.

Hypothesis 6

There is no significant difference in the mean scores on self-efficacy of those who gained weight at the five week follow up, and those who maintained their weight loss.

Results

There was no significant difference found between the mean scores of self-efficacy, of those who gained weight at the five week follow up and those who maintained their weight loss (see Table 10).

Table 10

Mean Self-Efficacy Scores of those who Gained Weight and those who Maintained their Weight Loss

SE of Weight Gained			SE of Weight Lost		
n	M	SD	n	M	SD
4	29.76	6.13	26	31.89	4.46

t = -.93, p> .05

Table 10 shows the mean scores, standard deviation, and t-value of self-efficacy for those who gained weight and those who maintained their weight loss.

Additional Findings

In order to gain more understanding of the program, more detailed information concerning exercise habit and nutritional knowledge of participants, in the experimental group were explored. Table 11 demonstrated participants exercise habits at the start of the program and at the five week follow up. Table 12 and Figure 2 show participant's nutritional knowledge at the start and at the end of the program.

Table 11

Comparison of the Experimental Group's Exercise Habits at the Beginning of the Program and at the Five Week Follow up

Exercise Habit	Beginning		Five Week Follow up	
	%	n	%	n
yes	23	7	60	18
no	77	23	40	12

Table 11 shows that 23 percent, of the experimental group, exercised on a regular basis, before entering this program and that 60% continued to exercise on a regular basis after the program. Seventy-seven percent of the participants did not exercise on a regular basis before entering this program and 40%, even at the five week follow up still didn't exercise on a regular basis.

Table 12

Mean Comparisons of Nutritional Knowledge at the start and at the end of the Program

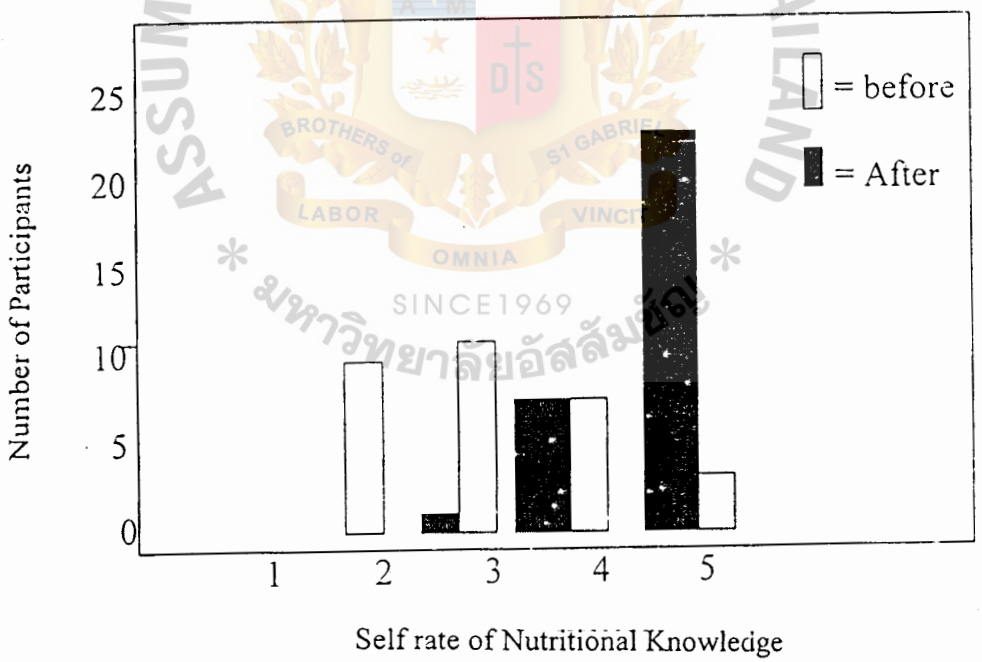
Nutritional Knowledge at the Start			Nutritional Knowledge at the End		
Range	M	SD	Range	M	SD
2-4	3.13	1.08	3-5	4.17	.58

n = 30, t = 7.14, ***p<.001

Table 12 demonstrated the mean comparisons of participant's nutritional knowledge at the start of the program and after the program. The mean score of participant's knowledge at the start of the program was 3.13 and the mean score of participant's knowledge after the program was 4.17. The t value was 7.14. The mean differences was significant at .001.

Figure 2

Comparison of the Experimental Group's Nutritional Knowledge Before and After the Program



Participants rated their knowledge of nutrition as an increase.

CHAPTER V

SUMMARY AND DISCUSSION

This chapter consists of a summary of the research study, a summary of the results, the discussion about the findings and the researcher's recommendations for further research and ways to improve the Weight Reduction Program.

Summary

Purpose

The purpose of this research was to determine whether the set up program that included exercise, nutritional advice, and group support would help participants lose and then maintain their weight loss. At the same time, to assess the effect of weight loss on self-efficacy, and the effect of self-efficacy on weight maintenance.

Research Design

This study was a Quasi- experimental with a pre and post test design.

Sample

There were 60 participants in this study between ages of 14 to 57. Thirty in the control group and thirty in the experimental group.

Procedure

The Weight Reduction Program was advertised through the local English language newspaper and through flyers posted in various areas around Bangkok. A total of 66 individuals, who showed an interest, were divided into two groups. Thirty-six people participated in the experimental group, with 6 dropping out, and 30 people participated in the control group.

Instrumentation

The Demographic Data Form was used to elicit personal information. The General Self-Efficacy Scale made up of 10 items was designed to measure general self-efficacy. A Self-Report on Exercise Habits and Nutritional Knowledge was used at the beginning of the program and at the follow up session. A Four Week Weight Chart was used to record weekly weights and a Weekly Food Intake Chart was used to record weekly food intake.

Data Collection

The General Self-efficacy Scale was distributed to both the control and the experimental groups at the beginning of the program and also at the end. The Self-Report on Exercise Habits and Nutritional Knowledge was distributed to the experimental group at the beginning of the program and also at the five week follow up session. Weight measures were collected on a weekly basis for both the control and experimental groups by the researcher.

Data Analysis

The t-test was used to test the hypotheses. Data collected on Self-Report on Exercise and Nutritional Knowledge were analyzed by the mean, standard deviation, frequency, and percentage.

Hypotheses

1. There is no significant difference in the mean weight of the experimental group after completion of the program and at the beginning of the program.
2. There is no significant difference in the mean weight of the control group at the conclusion of the program and at the start of the program.
3. There is no significant difference in the experimental group's mean weight at the completion of the program and five weeks later.

4. There is no significant difference between the pre and post test self-efficacy mean scores for the experimental group.
5. There is no significant difference between the pre and post test self-efficacy mean scores for the control group.
6. There is no significant difference in the mean scores of self-efficacy of those who gain weight at the five week follow up, and those who maintain their weight loss.

Results of the Study

1. There was no significant difference found between the mean weight of the experimental group at the completion of the program and at the beginning of the program.
2. There was no significant difference found between the mean weight of the control group at the start of the program and at the conclusion of the program.
3. There was no significant difference found between the mean weight at the completion of the program and the mean weight at the five week follow up of the experimental group.
4. There was no significant difference found between the pre and post test self-efficacy mean scores for the experimental group.
5. There was no significant difference found between the pre and post test self-efficacy mean scores for the control group.
6. There was no significant difference found between the mean scores of self-efficacy, of those who gained weight at the five week follow up, and of those who maintained their weight loss.

Discussion

In taking a closer look at the raw data of the experimental group's weight chart of the comparison between Week 1 and Week 4, there were four participants who gained weight. One of the four participant's missed 30% of the entire program, two participants were frequently late and so missed part of the exercise program, which occurred during the first hour, and the fourth participant had relatives visiting which attributed to her weight gain due to dinning out more frequently than normal. When we look at the chart of the comparison between Week 1 and Week 4 of the control group, we can see that 17 participants gained weight which is quite a lot when compared to only four in the experimental group.

With regards to the findings that there was no significant difference in mean weights of the experimental group at week four and the follow up, the weight gained during the follow up, may have been attributed to the short time period of putting into practice the learned lifestyle changes. The program may have been too short.

In light of the findings that there was no significant difference between the mean scores of pre and post self-efficacy for the experimental group and the control group, this would seem to indicate that the program had no effect on change in self-efficacy.

In terms of the mean score of self-efficacy of those who gained weight at the five week follow up and the mean scores of those who maintained their weight loss, the set up program comprised of exercise, nutritional advice, and group support did not have any significant influence on weight loss. There was no significant differences between self-efficacy of those who lost weight and those who gained weight. These research findings are not congruent with previous

research findings done by Clark, Abrams, Niava, Eaton, & Rossi (1991). They found that pre treatment self-efficacy, as measured by a 10-item scale, was significantly related to weight loss. Also, post treatment efficacy was significantly related to maintenance of the lost weight at a six week follow up. This may be due to different sampling as well as the criteria for weight loss and weight maintenance.

Interestingly, in looking at Table 11 on the comparison of exercise habits of the experimental group, before and after the program, 60% of participants continued to exercise. Also, in looking at the self-report on nutritional knowledge of participants, it was found that the average mean score increased significantly in the follow up session. This seems to indicate that the nutritional part of the program was sufficient in bringing greater knowledge and awareness to participants.

In considering the group support part of the program, there were several activities undertaken which included sharing thought and feelings, recording weekly food intake as a means of bringing greater awareness to participant's eating behaviors, and the offering of some techniques as a way of controlling food intake. Group support offered participants a safe place to share their thoughts and feelings with one another. Group support also offered them a chance to learn from each other. The researcher felt this part of the program served its function.

Interesting questions arise as to why the program did not seem to work. Even with gaining nutritional knowledge, it doesn't seem to be enough for participants to put this knowledge into practice fully after the completion of the program. Several factors arose,, as the researcher discovered in the follow up session of the

program, that seems to stand in the way of participants putting into practice their knowledge during the program and after the program.

One such factor is the need for an ongoing support group. It is hard standing alone when it comes to losing and maintaining weight.

Other factors arose when the researcher asked participants in the follow up session what they found hard about losing and maintaining their weight. One of the issues they brought up was the lack of sugar free/fat-free products here in Thailand, such as fat-free snacks and low calorie pre-packaged foods. Some participants found, in their own country, they had more access to such foods. The sugar free foods they were able to find here were rather expensive, so they opted not to buy them and eat regular food.

Another issue that arose was, that having a maid in the house to do all the cooking, it tended to keep them from being more responsible for what was cooked. They found it easier to let the maid choose what she would make.

Another issue that was stated was, due to their jobs or that of their spouse's, they tended to entertain more often which led them to overeat. Also, entertaining took place later in the evenings due to traffic jams.

Another factor brought up was, a lack of sufficient public parks or facilities to walk and exercise in. They felt the health clubs were over priced and too time consuming to go back and forth due to the traffic.

The last issue participants mentioned was that they felt a lack of motivation due to the hot weather in Thailand.

Finally, it is interesting to note that participants pointed to external factors as the reason for their weight problem instead of internal factors. This could be attributed to the level of their self-efficacy.

Conclusion

The set up program for weight reduction introduced in this study did not appear to be sufficient for weight loss and weight maintenance, due to the length of the program, and the lack of diet constraints.

Recommendations

Recommendations for further research and improvement of this research study are as follows:

For Further Research

1. More efforts to assess motivation for significant diet and exercise changes.
2. A more detailed look at stressors, and emotional issues that might prohibit attempts to lose weight.
3. Explore the use of another instrument that might prove more beneficial in measuring self-efficacy and its relationship to weight loss and maintenance.
4. A more detailed exploration of previous attempts to lose weight and how that might influence a participant in a set up program.
5. A more regimented diet could be introduced instead of just nutritional advice.

Improvement of the Program

1. A longer program might prove to be more beneficial. Giving participants a structured setting over a longer time period would enable them to form better habits of exercise and awareness of food intake.
2. Follow up plans should be on a longitudinal scale. This would allow for better evaluation of participant's progress.
3. Group support can be extended by including involvement from participant's family and significant others.

REFERENCES

Abraham, S. & Llewellyn-Jones, D. (1992). Eating disorders: the facts. (3rd ed.) New York: Oxford University Press.

Bandura, A. (1995). Self-efficacy: The exercise of control. New York: Freeman.

Bandura, A. (1982). Self-efficacy mechanism in human agency. American Psychologist, 37, 122-147.

Baron, R.B. (1995). Understanding obesity and weight loss. [on-line]. Available: Obesity and Weight Issues.

Baron-Faust, R. (1997). Mental wellness for women. New York: William Morrow and Company, Inc.

Bartlett, S.J. (1995). The psychological effects of exercise on dieting obese women. [on-line]. Dissertation Abstracts International, p. 2929 Abstract from: Digital Dissertations: ProQuest. Item: 576412.

Brown, J.E.(1995). Nutrition now. Minneapolis: West Publishing Co.

Chambliss, C.A., & Murray, E.J. (1979). Efficacy attribution, locus of control, and weight loss. Cognitive Therapy and Research, 3 , 249-353.

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.

Daily dietary fat and total food-energy intakes: Third National Health and Nutrition Examination Survey, Phase I, 1988-1991. MMWR Morbidity and Mortality Weekly Report. 1994; 43: 116-117, 123-125.

DePue, J.D., Clark, M.M., Ruggiero, L., Medeiros, M.L., & Pera, Jr.(1995) . Maintenance of weight loss: a needs assessment. Obesity Research, 3, 241-8 .

Foreyt, J.P. (1987). Issues in the assessment and treatment of obesity. Journal of Consulting and Clinical Psychology, 55, 677-684.

Garrow, J.S. & Summerbell, C.D (1995). Meta-analysis: effect of exercise, with or without dieting, on the body composition of overweight subjects. European Journal of Clinical Nutrition, 49, 1-10.

Goodstein, L.D. (1994). Self-efficacy. In Encyclopedia of Psychology (vol. 3, pp. 368-369). New York: John Wiley & Sons.

Haslam, D. (1994). Bulimia. Great Britain: Cox & Wyman Ltd.

Holloway, J.D., Beuter, A., & Duda, J.L. (1988). Self-efficacy and training for strength in adolescent girls. Journal of Applied Social Psychology, 18, 699-719.

Johnson, W. & Johnson, P. (1994). Joining Together: Group Theory and Group Skills (5^{th} Ed.) Boston: Allyn and Bacon.

Martin, G., & Pear, J. (1992). Behavior Modification: What it is and How to do it. (4^{th} Ed.) New York: Oxford University Press.

McAuley, E. (1993). Self-efficacy and the maintenance of exercise participation in older adults. Journal of Behavioral Medicine, 16, 103-113.

McAuley, E. (1992). The role of efficacy cognitions in the prediction of exercise behavior in middle-aged adults. Journal of Behavioral Medicine, 15, 65-87.

Miller, W.C., Koceja, D.M.. & Hamilton, E.J. (1997). A meta-analysis of the past 25 years of weight loss research using diet, exercise, or diet plus exercise intervention. International Journal of Obesity Related Metabolism Disorder, 21, 941-947.

Parham, E.S. (1993). Enhancing social support in weight loss management groups. Journal of the American Dietetic Association, 93, 1152-8.

Pope, J. (1995). The Last Five Pounds. New York: Pocket Books.

Powter, S. (1993). Stop the Insanity. Great Britain: Orion.

Pritchard, J.E., Nowson, C.A. & Wark, J.D. (1997). A worksite program for overweight middle-aged men achieves lesser weight loss with exercise than with dietary change. Journal of the American Dietetic Association, 97, 37-42.

Rash, E.M. (1995). Changes in perceived health locus of control and perceived self-efficacy following participation in an exercise program. UMI Dissertation Services: A Bell & Howell Company.

Schwarzer, R. & Fuchs, R. (1995). Self-efficacy and health behaviors. Predicting health behavior: research and practice with social cognition models. [on-line]. Available: Ralf Schwarzer.

Sherer, M., Maddux, J., Mercandante, B., Prentice-Dunn, S., Jacobs, B., & Rogers, R.W. (1982). The Self-efficacy scale: construction and validation. Psychological Reports, 51, 663-671.

Skender, M.L., Goodrick, G.K., Del Junco, D.J., Reeves, R.S., Darnell, L., Gotto,

A.M., & Foreyt, J.P. (1996). Comparison of 2-year weight loss trends in behavioral treatments of obesity: diet, exercise, and combination interventions. Journal of the American Dietetic Association, 4, 342-346.

Troiano, R.P., Kuczmarski, R.J., Johnson, C.L., Flegal, K.M., & Campbell, S.M. (1995). Overweight prevalence and trends for children and adolescents: The national health and nutrition examination surveys, 1963 to 1991. Archives of Pediatric and Adolescent Medicine, 149, 1085-1091.

Wadden, T.A., & Frey, D.L. (1997). A multicenter evaluation of a proprietary weight loss program for the treatment of marked obesity: a five year follow-up. [on-line]. International Journal of Eating Disorders, 22, 203-212. Abstract from PubMed File: UI: 97404966.

Wadden, T.A. (1993). Treatment of obesity by moderate and severe caloric restriction. Results of clinical research trials. [on-line]. Ann Intern Med.

Walcott-McQuigg, J.A. (1995). Stress, women and weight control behavior. Journal of Cultural Behavior, 2, 64-71.

Weight-control Information Network. (1996). Physical Activity and Weight Control. [on-line]. Bethesda, MD 20892-3665.

Woodruff, S.L. & Cashman, J.F. (1993). Task, domain and general efficacy: A reexamination of the self-efficacy scale. Psychological Reports, 72, 423-432.

APPENDIX A: DEMOGRAPHIC DATA FORM

1. Name _____.

2. Nationality _____.

3. Age _____.

4. What is your current employment status?

   (A) Employed ____.
   (B) Homemaker ____.
   (C) Retired ____.
   (D) Unemployed ____.
   (E) Volunteer Work ____.

5. Specify the type of employment or occupation _____.

6. Approximately, what is your combined household income?

   (A) Less than $20,000 ____.
   (B) $20,000 - $24,999 ____.
   (C) $25,000 - $34,999 ____.
   (D) $35,000 - $49,999 ____.
   (E) $50,000 or more ____.

APPENDIX B: Permission for the use of the General Self-efficacy Scale

Re: General Self-efficacy scale

From: Ralf Schwarzer
To: Jate Virankabutra
Cc: Mary Wegner
Subject: Re: General Self-efficacy scale
Date: Monday, August 18, 1997 05:58:37

Dear Ms. Virankabutra,
Thank you for your interest in the scale and our work.
Everything is on the internet, including the 10 items
in 20 languages.
Do you want to translate the English version ?
Then you could be the first author of your language
adaptation
Have a look at the other languages to see how we
do it
You may also send us your normal mailing address to
receive more information
Regards,
Ralf Schwarzer
At 02:45:18 08:97 PDT, you wrote
>
> Aug 18, 1997
>
>Dear Mr. Schwarze
>
> I am doing research at a University here in Thailand. My thesis is on
>The Effects of Behavior
>Weight Reduction on Self-Efficacy. I want to see if my program can
>influence a person's self-
>efficacy. I am trying to find the General Self-Efficacy Scale and wanted to
>know if you could tell
>me where I can order this scale with its manual. I would like to administer
>this test to my participates
>at the beginning and at the end of the program.
> I would greatly appreciate your help. I read many of the articles you
>have on the internet. I
>find the numerous studies into self-efficacy very interesting.
>
>
> Sincerely,
>
>
> Tresa
>
>
>

Prof. Dr. Ralf Schwarzer, Freie Universität Berlin, Psychologie
Habelschwerdter Allee 45, 14195 Berlin, Germany
FAX +49 30 838 5634 E-Mail: fu1270ap@zedat.fu-berlin.de
Homepage http://www.yorku.ca/academics/schwarze/
European Health Psych.: http://ehps.net
International Health Psych.: http://www.wp.com/accent/is.htm

APPENDIX C: GENERAL SELF-EFFICACY SCALE

(1) Not at all
(2) Barely true
(3) Moderately true
(4) Exactly true

1. I can always manage to solve difficult problems if I try hard enough ._____
2. If someone opposes me, I can find means and ways to get what I want. _____
3. It is easy for me to stick to my aims and accomplish my goals. _____
4. I am confident that I could deal efficiently with unexpected events. _____
5. Thanks to my resourcefulness, I know how to handle unforeseen situations. ____
6. I can solve most problems if I invest the necessary effort. _____
7. I can remain calm when facing difficulties because I can rely on my coping abilities. _____
8. When I am confronted with a problem, I can usually find several solutions. _____
9. If I am in trouble, I can usually think of something to do. _____
10. No matter what comes my way, I'm usually able to handle it. _____

APPENDIX D: SELF-REPORT ON EXERCISE HABITS AND NUTRITIONAL KNOWLEGE

1. Name _____.

2. On a scale from 1 to 5, with 1 being the lowest and 5 being the highest, how would you rate your knowledge of nutrition. For example, the effects of certain components of food on your health, which foods provide more energy, what foods constitutes a healthy balanced diet, what foods are higher in fats, etc.

   Please click one of the following 1 _____
   2 _____
   3 _____
   4 _____
   5 _____

2. Do you exercise on a regular basis? Yes _____
   No _____

   If yes, how often do you exercise? _____ times per week.

APPENDIX E: FOUR WEEK WEIGHT CHART

Name	Week 1	Week 2	Week 3	Week 4

APPENDIX F: WEEKLY FOOD INTAKE CHART *

	Breakfast	snack	Lunch	snack	Dinner	snack
Mon						
Tues						
Wed						
Thur						
Fri						
Sat						
Sun						

*actual size/ as shown 2:1