

THE EFFECT OF A WEIGHT-LOSS PROGRAM
ON PARTICIPANTS' SELF-ESTEEM,
NUTRITION KNOWLEDGE, AND
HEALTH BEHAVIORS

By

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CHAPTER I

INTRODUCTION

Attempting to lose weight is a constant source of frustration for many overweight people, and it produces intense feelings of failure for those who do not succeed. The majority of weight loss programs are unsuccessful because most of the weight that is lost tends to be regained after the treatment has ended. Brownell (1986) indicates that a dieter's attitude may be the most important link to long-term maintenance of weight loss. Recently, systematic behavior modification procedures have been developed to help people change their attitudes.

Many people believe that obesity is a psychological problem. Feelings of inadequacy, shame, guilt, helplessness, and inferiority are common among men and women who are overweight. Allon (1979) finds that self-blame, self-punishment, and guilt result from a lack of self-discipline, which contributes to a negative self-image.

Allon (1979) suggests that for weight loss to be achieved, perhaps a person must have somewhat of a positive self-image or high self-esteem. Similarly, it seems feasible that weight loss for an obese person would result in improved self-esteem. It also seems plausible that improved self-esteem

could help an individual lose weight and maintain weight loss. If some level of self-esteem is one of the prerequisites for permanent weight loss, then techniques to improve self-esteem become critical to the success of a weight-loss program.

Purpose of the Study

The purpose of this study was to determine the effect of a weight-loss program on self-esteem of program participants. The level of self-esteem of adults enrolled in a weight-loss program was compared to the self-esteem of persons not enrolled. The researcher also examined the effect of select variables on self-esteem of adults enrolled in a weight-loss program.

Objectives of the Study

1. To analyze repeated measures of self-esteem scores of individuals enrolled in a weight-loss program.
2. To compare initial and final self-esteem scores of individuals enrolled in a weight-loss program who either lost weight or did not lose weight.
3. To compare self-esteem scores of individuals enrolled in a weight-loss program to self-esteem scores of individuals not enrolled in a weight-loss program, who also needed to lose weight.
4. To assess if a relationship exists between body mass index (BMI) and self-esteem of individuals enrolled in a weight-loss program and individuals not enrolled in a

weight-loss program.

5. To determine if a relationship exists between initial self-esteem scores of individuals enrolled in a weight-loss program and select variables such as previous reduction diets, age, height, frame size, beginning weight, and percent weight change.
6. To compare pre and post-test scores for nutrition knowledge and health risk appraisal for participants enrolled in a weight-loss program.
7. To make suggestions and recommendations for health professionals who advise overweight individuals.

Hypotheses of the Study

The following hypotheses were tested for significance in this study.

1. There will be no significant difference in repeated measures of self-esteem scores of individuals enrolled in a weight-loss program.
2. There will be no significant difference in self-esteem scores for those who lost weight versus those who did not lose weight during the program.
3. There will be no significant difference in initial self-esteem scores of individuals enrolled in a weight-loss program and those not enrolled in a weight-loss program.
4. There will be no significant relationship between body mass index (BMI) and self-esteem for individuals enrolled in a weight-loss program and those not enrolled

- in a weight-loss program.
5. There will be no significant relationship between initial self-esteem scores and select variables such as previous reduction diets, age, height, frame size, beginning weight, and percent weight change for those individuals enrolled in a weight-loss program.
 6. There will be no significant difference in pre and post-test scores for nutrition knowledge and health risk appraisal for participants enrolled in a weight-loss program.

Assumptions of the Study

The researcher assumed that participants who were not enrolled in the Shape-Up program reported their heights and weights accurately.

Limitations of the Study

The sample consisted of adult men and women from two counties in Oklahoma who volunteered to participate; thus generalizations will be limited to this group.

Definitions

The following definitions were used in this study:

Adult: any person over the age of 18 years.

Body Mass Index: a ratio of weight-to-height used to classify obesity by degree of overweight. The classification is based on the index W/H^2 , where W is weight in kilograms,

and H is height in meters (Garrow, 1981). Subjects are measured in light clothing, but without shoes.

Normal Weight: a body mass index of 20 to 25 for men, and 19 to 24 for women (Bray, 1980).

Overweight: a body mass index of 25 to 30 for men, and 24 to 30 for women (Bray, 1980).

Obese: a body mass index above 30 for men and women (Bray, 1980).

Shape-Up Program: an adult nutrition education program sponsored by the Oklahoma State University Cooperative Extension Service. The intent of the program is to help men and women learn nutrition information, lose weight through proper diet and exercise, provide group interaction, and possibly improve self-esteem of the participants.

CHAPTER II

REVIEW OF LITERATURE

A panel of experts from the National Institutes of Health recently concluded: "the evidence is now overwhelming that obesity, defined as excessive storage of energy in the form of fat, has adverse effects on health and longevity" ("Health Implications," 1985, p. 151). Numerous health professionals agree that obesity is hazardous to physical health and detrimental to psychological well-being. Obesity is one of the most important medical and public health concerns of our time because of its epidemic proportions. In 1980, the U.S. Public Health Service (USPHS) recognized weight control as a national health priority. USPHS outlined specific objectives for our nation, which included two recommendations concerning obesity: 1) reduce the prevalence of overweight/obesity among U.S. adults by the year 1990, 2) place emphasis on improved awareness of safe and effective means of losing weight ("Report of the Scientific," 1986).

The relationship between obesity and health is well documented but poorly understood. Numerous diseases occur in the obese in excess of the expected rate including hypertension, coronary artery disease, adult-onset diabetes, and some forms of cancer. Despite the medical risks associated with obesity,

health may not be the reason most people want to lose weight. In general, obese individuals are more concerned with the psychological and social effects of their condition rather than the medical aspects. The stigma of obesity creates problems in a variety of life experiences including dating, career advancement, and college admission (Brownell, 1986). Health care professionals must consider the psychosocial issues as well as medical conditions when dealing with patients who are obese.

Definition of Obesity

The terms obese and overweight are often used interchangeably, even though they are different conditions. Obesity is generally defined as a surplus of body fat (Garrow, 1981; Kannel, 1983; Katch & McArdle, 1983; Simic, 1980). Overweight simply refers to body weight in excess of a standard, usually the average weight for a specific height (Katch & McArdle). Consequently, not all persons who are overweight are overfat. Football players may be overweight due to massive muscle and bone structure, but their percentage of body fat may be relatively low. However, the majority of people who are more than 20 percent over an "ideal" weight are usually overfat/obese (Dwyer, Feldman, & Mayer, 1970). Accurate determination of body fat composition, although technologically possible, requires impractical procedures for clinicians and researchers. Therefore, most health professionals rely on height-weight charts or weight-to-height ratios to

quantify obesity. Fortunately, both indexes provide similar estimates (Kannel, 1983).

Metropolitan Life Insurance Company Tables

The 1959 and 1983 Metropolitan Life Insurance Company tables are well-recognized and readily available standards of height and weight associated with the lowest mortality using actuarial data. The 1959 tables give "desirable" weight ranges and are more in line with tables that were used to develop the 1980 Recommended Dietary Allowances (Weigley, 1984). The 1959 tables are also utilized in the U.S. Department of Agriculture Bulletin, Dietary Guidelines for Americans (1985). The 1983 tables reflect an increase in weight for height, and there is some controversy over which tables should be used (Straw, 1986; Weigley, 1984).

For convenience, obesity is often defined as 20 percent or more above ideal body weight, with ideal representing the average weight within the desirable range on the tables (Garrow, 1981). Height and weight tables are limited to the extent that (1) they are formulated on specific populations, and they may not be applicable to those in lower socioeconomic groups; (2) they do not provide information on degree of obesity; (3) frame size is subjectively determined; and (4) age is not taken into account (Huth, 1985).

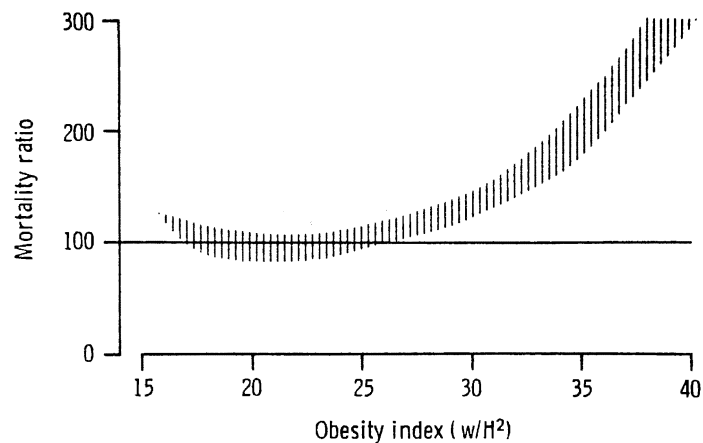
Body Mass Index

The body mass index (BMI) is a popular method for

determining degree of obesity. The index is based on the ratio W/H^2 , where W is weight in kilograms, and H is height in meters. Subjects are measured without shoes and with indoor clothing. Nomograms for determining BMI are also available (Appendix A). The body mass index has been recognized as the favored ratio for identifying the degree of obesity because it correlates best with skinfold measurements (Simopoulos, 1985) and is more specific than "percent overweight" (Huth, 1985). The BMI for men with normal weight is 20 to 25, and for women, 19 to 24. For overweight men, the range is 25 to 30, and for overweight women, 24 to 30. Both obese men and women have a BMI greater than 30 (Bray, 1980).

Garrow (1981) simplified the classification system for obesity by assigning the same boundaries for both sexes. He quantified the severity of obesity by using a grade system: Grade 0, 20-24.9; Grade 1, 25-29.9; Grade 2, 30-40; and Grade 3, over 40. Garrow chose Grade 0 as the zone associated with minimum mortality, and it correlates with the desirable weight range from both height-weight tables. Grade 1 has only a slight increase in mortality, and Garrow suggests that if everyone who entered this grade progressed no further, the clinically significant Grades 2 and 3 problems would never occur. Grade 2 illustrates the transition range from clinically trivial to clinically crippling obesity. Grade 3 obesity is practically incompatible with normal employment and is considered clinically severe (Garrow).

The relationship of obesity index to mortality is represented in Figure 1. Below 20, the mortality ratio tends to increase for reasons which are not fully understood. The 1959 life insurance statistics may have been influenced by mortality from tuberculosis among very thin people, but recent surveys have shown a similar trend which cannot be explained by tuberculosis (Garrow, 1981). It has been postulated that cigarette smoking, which is associated with lower weight and shorter life span, may be a factor in this increase (Weigley, 1984).



Source: Garrow, J. S. (1981). Treat obesity seriously. New York: Churchill Livingstone.

Figure 1. Relation of obesity index to mortality ratio.
Average mortality = 100.

Incidence and Prevalence of Obesity

Current estimates regarding the prevalence of obesity vary, but all reports indicate a high rate of occurrence in the United States. Katch and McArdle (1983) state that 60 to 70 million adults and 10 to 12 million children in the U.S. are overweight. Other researchers suggest that 10 to 50 million people are overweight (Hahn & Betts, 1986). Bray (1983) reports that 24 million Americans are obese, when the standard for obesity is 20 percent above desirable body weight. Statistics regarding obesity vary with the use of different investigative practices, various definitions of obesity, and specific demographic characteristics of the population (Lebow, 1984).

Demographic Characteristics

Data from the 1977-1980 Health and Nutrition Examination Survey (HANES II) show that more women than men in the United States are obese (Grunewald, 1985). Approximately 14 percent of American men and 24 percent of American women aged 18-74 are obese according to Bray (1983). Weight generally increases with age in both sexes until late in life when weight tends to decrease. However, it is not guaranteed that the prevalence of obesity increases throughout life (Kannel, 1983).

The prevalence of obesity in children is an increasing problem. Data from a study of preschool children indicate

that 23.4 percent of the children were overweight and 7.5 percent were obese (Patterson, J. T. Typpo, M. H. Typpo, & Krause, 1986). Data from the National Health and Nutrition Examination Surveys (NHANES I and II) show that over the past 20 years, the prevalence of obesity has increased by 54 percent among 6-11 year old children and by 39 percent among 12-17 year old children. Although childhood obesity does not always lead to adult obesity, there is evidence that it is a significant risk factor (Huth, 1985). The intractability of adult obesity has resulted in an emphasis on the prevention of childhood obesity, rather than treatment in adulthood.

Socioeconomic Influences

Socioeconomic factors are also related to the incidence of obesity (Jordan, 1974; Kannel, 1983; Sonne-Holm & Sorensen, 1986). In a study of preschool children, mothers who attended or received a degree from graduate school had significantly leaner children than mothers with less education (Patterson, J. T. Typpo, M. H. Typpo, & Krause, 1986). Israel, Silverman, and Solotar (1986) studied children who were involved in a weight-loss program and found that children with at least one overweight parent are heavier than children of non-overweight parents. They also discovered that children from lower socioeconomic levels are heavier than children from middle and upper socioeconomic levels.

An examination of HANES I data shows that a greater percentage of women below the poverty level are obese, while

a greater percentage of men above the poverty level are obese. Also, black women are more likely to be obese than white women, but black men and white men are about equally likely to be obese (Fullarton, 1980). These data indicate that as women in particular move up the social ladder, thinness seems to be more highly valued.

In contrast, less affluent societies associate a higher standard of living with a greater prevalence of obesity. Kannel (1983) states

In a society with a surfeit of good food and drink and shrinking opportunities for exercise as an obligatory condition of daily life, obesity would seem inevitable, particularly when dining is viewed as a form of entertainment (p. 6).

Etiology of Obesity

In theory, obesity seems to be a simple problem involving excess energy intake and/or insufficient energy output. However, the more obesity is studied, the more complex it becomes (Van Itallie, 1983). It is almost certain that obesity has multiple causes and that there are different types of obesity (Huth, 1985). A host of different factors influence energy intake and expenditure. To further complicate matters, many researchers suggest that some degree of obesity may be biologically desirable and/or physiologically maintained (Brownell, 1984; Garrow, 1981; Van Itallie, 1983). There are many theories regarding physiological body weight regulation, but the two most common are the fat-cell theory and the set-point theory (Brownell, 1984). Additionally,

demographic and environmental factors have a strong influence on whether or not obesity manifests itself.

Physiological Factors

Fat-Cell Theory. Adipose tissue increases either by an increase in fat cell size or by an increase in fat cell number. Hirsch and Knittle (1970) were the first to suggest that persons with adult-onset obesity have fat cells much larger (hypertrophy) than those of non-obese controls, and that persons who have been obese since childhood have an increased number of fat cells (hyperplasia). They hypothesized that nutritional and genetic factors during infancy and childhood led to a threefold increase in fat cell number during the first 12 months of life, with a gradual increase during childhood and a stabilization during adolescence. Thus, weight fluctuations in adults should occur only by changes in cell size and not in cell number.

Recent research, however, has shown that the body fat acquired during the first 12 months of life is due to an increase in the weight of the fat cells, while the number of fat cells begins to increase after the first year and stabilizes during adolescence (Sjostrom, 1980). Brownell (1984) and Leiter (1986) report that cell number can increase in adults during prolonged periods of positive energy balance, and that cell number may decrease when individuals lose a large amount of weight and maintain the loss for prolonged periods. The fat-cell theory, however, suggests that

individuals with extreme hyperplasia may have difficulty losing weight because of biological pressure to keep the fat cells full (Brownell, 1984).

Set-Point Theory. Supporters of the set-point theory suggest that the body has an internal control mechanism, a set point, located in the hypothalamus, that drives the body to maintain a particular level of body fat (Katch & McArdle, 1983). Brownell (1984, p. 407) describes the set point as an "ideal biological weight for an individual". Physiological and psychological signals may be sent throughout the body to defend a constant body weight. Therefore, when an individual (with a set point above society's norm) attempts to lose weight by dieting, he/she may experience tremendous internal resistance.

Keeseey (1980) reexamined a study during World War II in which individuals were subjected to a semistarvation diet for a 24-week period. Weight loss was rapid at first, but by the end of the study their body weights were stable, indicating that they had reached a state of energy balance. At the beginning of the study, the subjects' food intake was decreased to about half their typical intake at normal weight. By the end of the study, subjects were no longer losing weight; apparently their energy needs had also been cut in half.

Changes in the subjects' basal metabolic rate (BMR) accounted for at least part of this reduction in energy expenditure. The final mean basal metabolic rate for the

subjects was 28.9 percent below the original BMR, which was measured prior to food restriction. After adjustments were made for tissue loss, the metabolic rates were still 16 percent below their initial levels. Therefore, the decrease in BMR was not simply a result of loss of metabolically active tissue, but reflected an actual reduction in the metabolic rate of the remaining tissue.

Keesey (1980) suggests that humans resist being displaced from their set points by reducing their rates of energy expenditure. When body weight decreases below a normal level, there is a corresponding decrease in the rate of energy expenditure. As a result, the number of calories needed for weight maintenance is substantially reduced, and returning to normal levels of daily food intake results in rapid weight gain. Keesey maintains that increases in body weight above typical weight will markedly increase the rate of energy expenditure. Numerous studies on animal set points support human experiments. Thus, it seems that mammals defend their set points (Adolph, 1947; Brooks & Lambert, 1946; Cohn & Joseph, 1962; Coleman, 1981).

The weight of most mature animals remains relatively constant and is defended against a wide variety of environmental circumstances (Stunkard, Stinnett, & Smoller, 1986). When body weight increases, such as before hibernation or migration, the increased weight is precisely regulated to the impending energy requirements, which suggests a type of anticipatory regulation. Similarly, the regulation of weight

of obese animals is just as precise as the regulation of non-obese animals.

The set-point theory is controversial. Garrow (1981) states that long-term body weight regulation in humans is due to a conscious effort, rather than an automatic biological control. To test this theory, Garrow and Stalley (1975) designed a study to experimentally alter the weights of a group of non-obese persons by manipulating their food intake. They observed the recovery phase and kept their subjects ignorant of weight changes. The results show that after an average increase in weight of 13.2 pounds in 60 days, there was no evidence of weight loss during the following 200 days. Garrow and Stalley (1977) also report that when subjects of normal weight are placed on restricted diets and later given access to ad libitum food, they increase their weight beyond the original baseline values, hence ignoring their set points. Garrow (1981) supports the view that an individual's set-point weight is in reality, his/her attitude toward obesity, rather than an internal reference signal determined by hypothalamic centers or hormonal activity.

Environmental Factors

Inactivity. Obesity is the result of an energy imbalance such that energy intake exceeds energy expenditure (Garrow, 1981; Kannel, 1983). According to Mayer (1968), the most common type of obesity in this country is environmental in origin, arising from inactivity rather than from overeating.

Only a small percentage of cases appears to be caused by pre-existing physiologic or psychologic conditions.

The fat content of an individual's body is part of his/her dynamic equilibrium system (Booth, 1980). Eating and exercise behavior contribute to the overall equilibrium state. A great deal of this behavior has been acquired from past experience. Booth maintains that research on the origin and modifiability of human behavior plays an important role in controlling energy intake and output. If human behavior were better understood, counselors could improve their understanding of obesity.

Television. Dietz and Gortmaker (1985) examined longitudinal data from the two HANES surveys in which the same group of children was studied each time. Results of the study show that next to prior obesity, television watching is the strongest predictor of subsequent obesity in children. Dietz and Gortmaker believe that children snack while watching television, and they eat more of the food advertised on television. The message conveyed by television is that anyone can be thin regardless of what they eat, because nearly everyone on the television screen is thin. Furthermore, children who are watching television are inactive. This situation could also apply to adults.

Diet Composition. Van Itallie (1983) states that diet composition (high in fat and sugar; low in starch and fiber) is likely to be a cause of human obesity. He suggests that

strict vegetarians are slender whereas obesity is widespread among omnivorous Americans. Sclafani (1980) reports that high-fat diets stimulate the appetite and increase the efficiency by which dietary fat is converted into body fat. This improved efficiency is attributed to the lower energy cost of converting dietary fat into body fat. Compared to high-fat diets, the obesity-promoting effects of high-sugar diets are moderate (Sclafani). However, rats which are fed high-sucrose diets, store more body fat than rats which are fed high complex-carbohydrate diets.

Health Risks of Obesity

Physiological

Obesity is one of the most common medical disorders in this country. Its importance lies in its association with many diseases that may enhance morbidity and mortality (Bray & Teague, 1980).

Hypertension. There is a strong relationship between overweight and high blood pressure (Kannel, 1983). Intervention trials have shown that weight loss is accompanied by a corresponding reduction in blood pressure. Moreover, a subsequent rise in blood pressure is associated with regained weight, suggesting a causal relationship. Data from the HANES II survey indicate that the prevalence of hypertension is 2.9 times higher for overweight persons than for non-overweight persons (Huth, 1985).

Coronary Artery Disease. The relationship between coronary artery disease and obesity has been studied for many years. Kaplan and Kaplan (1957) state

It is not known whether the excess weight of the obese patient causes overwork of an already compromised atherosclerotic heart, helping to precipitate a coronary occlusion, or whether a high dietary fat content, characteristic of the diet of most obese patients, accelerates the production of atherosclerosis which in turn contributes to coronary heart disease (p. 182).

More recently, the relationship of obesity to the incidence of coronary artery disease has been studied on large population groups. Studies in which obesity is a predictor of coronary artery disease usually find that obesity is not a risk factor independent of the standard risk factors (hypercholesterolemia, hypertension, and cigarette smoking). However, the Framingham Heart Study, important because of its size, general population base, and long follow-up period, shows a direct association between degree of obesity and coronary artery disease, independent of other risk factors (Burton & Foster, 1985). Other recent studies indicate that the location of fat deposits may be a better predictor of coronary artery disease than the degree of obesity (Huth, 1985). Excess abdominal fat is more often related to heart disease than fat deposits in the gluteal or thigh areas.

Adult-Onset Diabetes. Obesity is an important risk factor for glucose intolerance and diabetes (Kannel, 1983). Mortality attributable to diabetes is four times higher among

persons who are overweight than persons who are normal weight (Garrow, 1981). Obesity is one of several factors which determines if an individual will develop high fasting blood glucose, glucose intolerance, glycosuria, and eventually the neuropathy, vascular, and renal changes which are the life-threatening complications of diabetes. It seems that obesity may cause an increased strain on the ability of the pancreas to secrete enough insulin to control glucose metabolism. In general, an obese adult diabetic secretes more insulin than a normal weight person, but less than is required for glucose homeostasis in an obese person. The high incidence of diabetes in elderly obese persons indicates that the insulin-secreting cells of the pancreas finally become exhausted in an effort to meet the high demands of the body.

Cancer. Numerous epidemiological studies link obesity to site-specific malignancies ("Health Implications", 1985). The American Cancer Society study has found that obese men, regardless of smoking habits, have a higher mortality rate from cancer of the colon, rectum, and prostate. Obese women have a higher mortality rate from cancer of the gallbladder, biliary passages, breast (postmenopausal), uterus, and ovaries. Among women with severe obesity, endometrial cancer shows the highest relative risk compared to non-obese women (Burton & Foster, 1985). Teenagers who are obese have a 1.6-fold increase in endometrial carcinoma compared to lean teenagers (Kannel, 1983).

Psychosocial

The National Institutes of Health have declared that "obesity creates an enormous psychological burden...in terms of suffering, this burden may be the greatest adverse effect of obesity" ("Health Implications", 1985, p. 148). Studies have shown that various types of psychosocial disability are more prevalent among obese persons than non-obese persons (Kannel, 1983). Obesity is a social stigma in middle and upper-class societies. As a consequence, it is possible that the obese have lower self-images than persons who are not obese. However, there are few studies which show that obesity actually causes a poor self-image. In contrast, a poor self-image may lead to obesity.

Social Discrimination. Maddox, Back, and Liederman (1968) find that most Americans regard obesity as a socially deviant form of physical disability. Subjects in their study blame the obese for being fat, but feel that persons with other physical handicaps should not be blamed for their conditions. A common complaint among obese persons is that they are socially unsuccessful (Garrow, 1981). Scientifically, this is a difficult situation to investigate. However, psychometric tests of patients before and after massive weight loss produced by intestinal bypass surgery indicate that their psychosocial status improves (Solow, Silberfarb, & Swift, 1974).

Sonne-Holm and Sorensen (1986) conducted a study to

investigate the relationship between obesity and attainment of social class. They studied morbidly obese military draftees in Copenhagen between 1956 and 1977. The obese draftees were compared to randomly selected non-obese young men from the remainder of the population. Both groups were followed for an average of 12.5 years after which time their occupations were obtained. Social class was derived from an occupational ranking system based on prestige, from 0 (unskilled, manual labor) to 7 (for example, judge; professor). Among the obese subjects, only 30 percent attained a position above social class 2, compared to 51 percent in the control group. This difference could not be accounted for by lower parental social class, intelligence test score, or educational level among the obese subjects.

According to Dwyer, Feldman, and Mayer (1970), some people regard obesity as an immoral condition. They apparently base their beliefs on the theory that obesity arises from the sins of gluttony and laziness. Schumaker, Krejci, Small, and Sargent (1985) find that obese subjects are more likely to be lonely than non-obese subjects. Some obese persons perceive themselves as having a socially unacceptable body which may foster feelings of loneliness. Also, non-obese persons may exaggerate the situation by avoiding their obese peers. If this is true, obese individuals would be limited to a smaller and less rewarding social network.

Negative evaluations about obese persons extends to physicians' attitudes as well (Dwyer, Feldman, & Mayer, 1970).

Obese persons are described by their doctors as being more weak-willed, ugly, and awkward than their other patients. Huth (1985, p. 950) states "a long-term strategy to make overeating socially unacceptable may offer the best answer to reducing obesity as a health risk."

A study conducted by Canning and Mayer (1966) concluded that unconscious prejudices held by teachers and college interviewers may decrease the chances for obese persons to be admitted into elite colleges. Results of this study show acceptance rates into high-ranking colleges are lower for obese students, especially girls. A follow-up study indicates that obesity is not correlated with intelligence on the basis of IQ and SAT scores (Canning & Mayer, 1967). Therefore, it appears that teachers' negative attitudes toward obese students do not prevent students from scoring high on academic tests. Prejudices against obese applicants seem to come from direct contact with them.

Society emphasizes thinness, and obesity is perceived as being wrong, abnormal, or unhealthy. Although the conditions associated with obesity can be severe, most people desire to lose weight because they want to look better and conform to society's standard of body size, not because they are concerned about their health (Jordan, 1974). Historically, and even in other countries, obesity is not condemned as much as it is in the United States.

Low Self-Esteem. According to Hudson (1982, p. 4) "self-esteem is the evaluative component of self-concept." Someone

may have an accurate self-concept, but a severe problem with self-esteem. For example, individuals may see themselves as domineering and demanding (self-concept). If they like domineering and demanding people, they probably have a high level of self-esteem. Conversely, if they dislike such people, a low level of self-esteem might exist.

Coopersmith defines self-esteem as

. . . the self-evaluation which the individual makes and customarily maintains with regard to himself; it expresses an attitude of approval or disapproval, and indicates the extent to which the individual believes himself to be capable, significant, successful, and worthy (Goble, 1970, p. 166).

People with low self-esteem lack trust in themselves and are reluctant to express themselves in a group. They listen rather than participate and are self-conscious and pre-occupied. Coopersmith further states that persons with low self-esteem see themselves as helpless and inferior--incapable of improving their situations and lacking resources to tolerate or reduce daily anxiety.

Cohen (1968) views self-esteem as the degree of agreement between an individual's ideal self-concept and his actual self-concept. Body images are fundamental components in the development of self-concept, and they contribute to personality development.

Many researchers have conducted studies that investigate the relationship between obesity and self-esteem. Sallade (1973) finds that obese children have significantly lower self-esteem than their normal-weight peers. Conversely,

results of another study indicate that no differences exist between the self-esteem of obese and normal-weight children (Wadden, Foster, Brownell, & Finley, 1984).

Other scientists have examined the association of obesity to body image. Stunkard and Mendelson (1967) have found that disturbances in body image that occur in some obese individuals could be attributed to several factors including the age of onset of obesity. Body image disturbances occur almost exclusively in those who are obese as children and rarely in those with adult-onset obesity. Stunkard and Mendelson suggest that a kind of circular relationship exists between body image disturbances, which predispose to esteem-lowering experiences, and depressive moods that, in turn, reinforce the disturbed body image.

Body image disturbances persist with little change over time and are rarely reversed. Unfortunately, even weight reduction and weight maintenance have little effect upon body image disturbances. In Allon's (1979) study of overweight children and adolescents, some children refer to themselves as ugly, sexually unattractive, bowls of jelly, tents, sand dunes, hippos, elephants, and tubs. Some children report that they feel like blobs. Others state that they hate to see themselves in swimsuits or without clothes.

Kaplan and Kaplan (1957, p. 196) state that "obesity results in feelings of inferiority, inadequacy and shame." These feelings and the obesity associated with them can be used to support all the failures and the interpersonal

relationships of the obese person. They may be used to avoid any further socialization with people and threatening situations.

Ludeman (1979) and Ramsey (1985) have measured the self-concept of persons involved in weight-loss programs. Both researchers find a significant difference in self-concept due to the severity of the overweight condition. Self-concept decreases as the magnitude of overweight increases. Ludeman finds that overweight and obese individuals have an overall self-concept lower than the normal-weight individuals. Ramsey states that women who are actively seeking to lose weight have slightly higher self-concept scores, even when they weigh slightly more than other homemakers. Another finding in her study is that obese women who fail to lose weight have a lower self-concept than the women who succeed. This finding corresponds with the results of Allon (1979) who reports that females who have trouble losing weight have an intensely negative body image, which may inhibit weight loss. A tentative conclusion from current self-esteem research is that in order to be successful at weight loss, a person must have a positive self-image or a certain level of self-esteem.

Treatment of Obesity

An important first step in the treatment of obesity is recognizing the refractory nature of this disorder (Brownell, 1984). In 1959, Stunkard and McLaren-Hume reported a

treatment success rate of only five percent of obese patients who were followed for three years. Every obese person is not motivated to lose weight; they will not all lose weight once they begin a program; and not all will keep the weight off. If the health care professional is prepared for marginal results at the beginning of the program, then treatment of the obese will be less frustrating.

Stuart's landmark study (1967) regarding obesity treatment through behavior modification techniques shows some promise for improving the success rate and is enthusiastically received by health care professionals. Unfortunately, recent research shows that behavior modification is useful, but enhances the success rate only modestly (Stunkard, 1978). No single form of treatment for weight loss has been proven to be successful. Barnstuble, Klesges, and Terbizan (1986) report that three potentially important predictors of successful weight-loss programs are changes in dietary patterns, exercise patterns, and metabolic rate. Therefore, comprehensive weight-loss programs including nutrition education, behavior modification, increased activity, and psychological support have been developed (Atkinson, Russ, Ciavarella, Owsley, & Bibbs, 1984).

In general, weight loss is achieved more easily than weight maintenance. Brownell (1982) states that if successful treatment is defined as a return to ideal body weight and maintenance of that weight for five years, a person is more likely to recover from cancer than from obesity. Weight

maintenance requires major lifestyle changes involving eating habits, activity levels, and psychological factors. Atkinson, Russ, Ciavarella, Owsley, and Bibbs (1984) report that after a four-year comprehensive weight-loss program, 39 percent of all patients who entered the program were still returning for checkups. This approach may prove to be a viable solution compared to previous treatment success rates.

With few exceptions, obese children and adolescents become obese adults because the cure of obesity is rare once it is well-established. Thus, it seems likely that preventing obesity in children may be the only way to prevent obesity in adults (Dwyer, Feldman, & Mayer, 1970). Fortunately, children are easier to reach than adults because schools have captive audiences. The following suggestions have been made by Dwyer, Feldman, and Mayer, for improving nutrition education in schools:

- a) in-service courses in nutrition for teachers, with special emphasis on weight control;
- b) increased efforts on the part of school health personnel in combatting overweight, including augmenting the staff with a part-time nutrition consultant; and
- c) improvement of physical education programs to include special classes aimed at addressing the handicaps of the obese.

Mellin, Slinkard, and Irwin (1987) have conducted a 15-month study involving overweight adolescents enrolled in

a weight-loss program and overweight subjects who were not enrolled. The program included a variety of cognitive, behavioral, and affective techniques for successful weight loss and management. A major finding of the study is that both groups showed a significant improvement in self-esteem at the 3rd and 15th month. However, the increase was greater for subjects enrolled in the program than for those not enrolled. Age and self-esteem are positively correlated during adolescence, which may account for the increase in self-esteem of the control group (Mellin, Slinkard, & Irwin, 1987). The researchers also speculate that subjects in the control group may have participated in other activities that improved their self-esteem. This study illustrates the difficulty involved in identifying causes of high or low self-esteem. Only the experimental group had significant improvement in relative weight, weight-related behavior, weight management knowledge, and less depression. In a similar comprehensive weight-control program designed for children, researchers found that if children followed the program faithfully, changes toward better nutrition, loss of body fat, and improved self-esteem were made (Robinson, Lankford, & Gorman, 1987).

Some degree of self-esteem may be necessary in order for weight loss to occur (Allon, 1979). Visocan, Dworkin, and Klein (1985) have developed a program that emphasizes: (1) techniques for increasing self-esteem, (2) the importance of setting realistic goals, and (3) the need to identify moods

that lead to overeating. They found that as patients reached their individual goals, their self-esteem increased. In a study that examined the relationship between self-esteem and achievement, Lynch and Clark (1985) found that self-esteem was related in a real and tangible way to scholastic achievement. Their findings have important implications for weight-loss programs; the achievement of weight loss might be improved through improvements in self-esteem.

Summary

Weight control has been recognized by the U.S. Public Health Service as a national health priority. Overweight is indeed a significant problem in our society, and excess body fat (obesity) is associated with many chronic diseases as well as decreased longevity. In addition to the physical complications, there are many undesirable social and psychological consequences associated with obesity. Physiological, psychological, and environmental factors are implicated in the etiology of obesity. There is no single cause of obesity; therefore, treatment of obesity should not be limited to a single approach. Weight-loss programs must be multi-disciplinary and need to include individual counseling, nutrition education, dietary management, physical activity, behavior modification, and techniques for improving self-esteem.

CHAPTER III

PROCEDURES

This chapter discusses the procedures followed to accomplish the objectives that were outlined in Chapter I. Research design, selection of the sample, description of the Shape-Up program, development of the instrument, collection of the data, and analysis of the data will be discussed. A Nutrition Specialist, Oklahoma State University Cooperative Extension Service, developed the Shape-Up program. The Oklahoma State University County Extension Director for Oklahoma County agreed to pilot test the Shape-Up program during the fall of 1986.

Research Design

The researcher used data obtained from a self-selected experimental group and a nonequivalent comparison group for her research design. Subjects in the experimental group paid an enrollment fee to participate in the program.

Population and Sample

The sample for this study consisted of 70 adults living in Oklahoma. The subjects were either enrolled in the Shape-Up program or members of an Oklahoma State University Cooperative

Extension Homemaker Club. Publicity for Shape-Up was generated through local newspapers. All of the subjects agreed to participate in the research study, and then signed informed consent documents at the first class meeting (Appendix B). All experimental subjects ($n = 37$), provided medical approval forms signed by their physicians. An enrollment fee of \$10.00 was charged for the Shape-Up program.

The researcher sought a comparison group to include similar subjects with a weight problem, but not in a weight-reduction program. She contacted the Kay County, Oklahoma State University home economist to see if she had extension homemaker clubs that might be interested in participating in the study as the comparison group. The home economist provided the researcher with a list of homemaker clubs in her county. The researcher then contacted the clubs by telephone and made arrangements to administer the self-esteem instrument at the next meeting for each of the five clubs which agreed to participate in the study. The comparison group consisted of 33 subjects.

Shape-Up Program

Shape-Up is a comprehensive adult nutrition education program that is designed to help adults learn about nutrition, lose weight through proper diet and exercise, provide group interaction, and possibly improve self-esteem. The program is available in select counties to home economists who desire to teach Shape-Up. Lessons provide participants with informa-

tion about the principles of nutrition, how to choose a balanced diet, how to start an exercise program, how to identify fad diets, and learn behavior modification techniques.

Shape-Up is a series of 10 lessons which may be modified to suit the needs of the participants and the instructor. Classes are approximately one hour in length. Evaluative measures are an integral part of the program. Included in these measures are pre and post-tests for nutrition knowledge, health risk behaviors, tests for changes in self-esteem, and weight loss/exercise records.

Instrumentation

Index of Self-Esteem

The Index of Self-Esteem (ISE) was chosen as the instrument for assessing the self-esteem of each subject (Appendix C). Permission to use the ISE was obtained from Walter W. Hudson, author of the instrument. The ISE is a rating scale designed for use in repeated administration to evaluate client response to treatment over time. The instrument is a 25-item summated partition scale wherein each item is scored according to the following five categories: 1 = rarely or none of the time; 2 = a little of the time; 3 = some of the time; 4 = a good part of the time; and 5 = most or all of the time. Some of the items are positively worded statements and others are negatively worded to partially control for response set biases. Positively worded items are reverse scored. All

scores are then summed, and 25 is subtracted from the total to produce a possible range of 0 to 100. A score less than or equal to 30 indicates that self-esteem is not a problem, while a score above 30 indicates the client has a problem with self-esteem.

The Index of Self-Esteem has high face, discriminant, and construct validity (Hudson & Proctor, 1976). In addition, Hudson (1982) provided convincing evidence to support the claim that the ISE rated as a highly reliable measurement device. The ISE was designed to measure the degree and severity of a client's problem with self-esteem. Thus, a high score on the ISE indicated the client had a self-esteem problem, a low sense of self-esteem. According to Hudson (1981), psychological scales must have the following characteristics: brevity, ease in administering, scoring, understanding, and interpreting results. Also, they must not suffer from response decay when used repeatedly. The ISE met all of these psychometric requirements.

Health Risk Appraisal

A checklist was used in this study to identify various individual lifestyle risk factors such as high salt intake, physical inactivity, high fat intake, alcohol consumption, and so forth (Appendix D). Fifteen items were listed, and participants responded by placing a check mark in the blank next to the factors that applied to them. The number of check marks was then totalled to obtain a pre-test score.

The instrument was administered again the final night of the program (post-test score).

Nutrition Knowledge Test

The researcher developed a true-false test to measure nutrition and exercise knowledge (Appendix E). Statements were formulated from subject matter taught in Shape-Up classes. The number of correct responses determined each score. The instrument was pretested for clarity and content validity by 12 senior-level nutrition and health education students who were enrolled in the Community Nutrition course at Oklahoma State University. After taking the test, students were shown the objectives for Shape-Up and asked to decide whether or not the test reflected the objectives. Students then submitted recommendations for revisions. Two test questions were reworded for clarity as suggested by the students.

To establish reliability, the split-half procedure for internal consistency was used. Two groups of people took the test ($n = 28$), and their scores were used to determine item stability. Scores for the odd-numbered items were correlated with scores for the even-numbered items. The coefficient of reliability was 0.74 for half the test. The Spearman-Brown formula was used to estimate the expected coefficient of reliability for the total test. The result was a coefficient of 0.85.

Collection of the Data

The researcher administered the Index of Self-Esteem (ISE) to each of the five homemaker clubs at their December, 1986 meeting. Anonymity was maintained by asking participants not to write their names on the forms. The ISE for the homemaker groups was modified to include a space at the top of the form for height, weight, and age. Each participant recorded her own statistics on the form. The accuracy of self-reported weights has been studied by a number of researchers (Stunkard & Albaum, 1981; Coates, Jeffery, & Wing, 1978). It was found that individuals reported their weight with surprising accuracy, even if they were unaware that they would be weighed shortly after they self-reported.

Data were collected from Shape-Up participants at each of the eight weekly classes. At the first meeting, subjects completed a registration form that included demographic information (Appendix F).

A clinical scale was used at the beginning of each class meeting to determine heights and weights with indoor clothing and without shoes. The wrist was measured with a tape measure where it bends on the right arm. The following formula was used to determine frame size (Whitney, Hamilton, & Boyle, 1984):

$$\text{ratio} = \frac{\text{height (cm)}}{\text{wrist circumference (cm)}}$$

The corresponding ratio was then compared to standard ratio values to determine whether subjects had a small, medium, or

large frame.

The Self-Esteem Index was administered at the first, second, fourth, sixth, and eighth class. According to Hudson (1982) valid results have been obtained by administering the scale once a week or once every other week. The health risk appraisal inventory and the nutrition knowledge test were administered at the first and final class.

Analysis of the Data

Research personnel scored, coded, and verified all data. The self-esteem scores were calculated and double-checked for accuracy. An IBM-PC in the Home Economics computer laboratory at Oklahoma State University was used to transfer the data to a computer disk.

An analysis of variance procedure with repeated measures on one factor was used to determine if a significant difference existed among self-esteem scores for the duration of the Shape-Up program. A t -test was used to determine if a significant difference existed in mean self-esteem scores of individuals enrolled in the weight-loss program who either lost weight or failed to lose weight. A t -test was also used to identify the significant difference between initial self-esteem scores of individuals enrolled and those not enrolled in the weight-loss program. A simple linear regression model with an indicator variable was used to determine if a significant relationship existed between body mass index and self-esteem scores of Shape-Up participants and the comparison

group. A multiple regression analysis was used to study the relationships between self-esteem scores of Shape-Up participants and select variables such as previous reducing diets, age, height, frame size, beginning weight, and percent weight change. A paired t-test was used to determine if a significant difference existed between pre and post-test scores of nutrition knowledge and pre and post health risk appraisals for Shape-Up participants.

CHAPTER IV

RESULTS AND DISCUSSION

The purpose of this study was to determine the effect of a weight-loss program on self-esteem of program participants. The author compared the beginning and ending scores of self-esteem for individuals enrolled in a weight-loss program to the self-esteem of a non-equivalent comparison group. The effects of other variables such as body mass index, previous reducing diets, age, height, frame size, beginning weight, and percent weight change were studied to determine their influence on self-esteem. To determine the effect of a weight-loss program on nutrition knowledge and health behaviors of participants, the researcher compared pre and post-test nutrition knowledge scores and health risk appraisals.

Description of the Sample

Seventy subjects participated in this study including 37 participants in the Shape-Up program (experimental group), and 33 members of Extension Homemaker clubs (comparison group). The sample population included 65 women and 5 men. Participants ranged in age from 27 to 96 years, including 28 subjects under the age of 50, and 41 subjects aged 50 or

over. One subject refused to report her age.

All subjects were categorized by weight according to the body mass index (BMI). Two participants were underweight, 23 were normal weight, 27 were overweight, and 16 were obese. Two subjects in the experimental group refused to be weighed. Thus, when data analyses involved body mass index, only 68 of the 70 subjects were included. The data showed that the two groups were very similar according to the number of subjects in each weight category (Table I).

TABLE I
DESCRIPTION OF EXPERIMENTAL AND COMPARISON
GROUPS ACCORDING TO WEIGHT AS
MEASURED BY BODY MASS INDEX

Experimental			Comparison		
Category	Number of Subjects	%	Category	Number of Subjects	%
Underweight	0	00.0	Underweight	2	2.9
Normal	14	20.6	Normal	9	13.2
Overweight	13	19.1	Overweight	14	20.6
Obese	<u>8</u>	<u>11.8</u>	Obese	<u>8</u>	<u>11.8</u>
Total	35	51.5	Total	33	48.5

Repeated Measures of Self-Esteem

The Self-Esteem Index was administered to weight-loss program participants at the first, second, fourth, sixth, and

eighth class. An analysis of variance procedure was used to determine if a significant difference in self-esteem mean scores occurred from the beginning to the end of the program. As data in Table II show, scores obtained from repeated measures of the self-esteem index were not statistically significant ($p = 0.115$). Therefore, the researcher failed to reject hypothesis one.

TABLE II
RESULTS FROM ANALYSIS OF VARIANCE PROCEDURE
FOR REPEATED SELF-ESTEEM SCORES
IN EXPERIMENTAL GROUP

Source	df	SS	MS	F-Value	P-Value
Repeated Scores	4	343.12	85.78	1.93	0.115
Subjects	33	20158.98	610.88		
Error	68	3018.99	44.40		
Total	105	23521.09			

Although the results were not statistically significant, data in Table III show that as the weight-loss program progressed, self-esteem mean scores gradually decreased (improved). At the beginning of the program, the self-esteem mean score

was 32.81, and the final self-esteem mean score was 23.80. A score below 30 indicates no evidence of a self-esteem problem.

TABLE III
MEAN SELF-ESTEEM SCORES OF EXPERIMENTAL
SUBJECTS WITH REPEATED MEASUREMENTS

Week	Measurement	Number of Subjects	Mean Score
1	1	27	32.81
2	2	20	27.90
4	3	22	24.50
6	4	17	25.71
8	5	20	23.80

Self-Esteem and Weight Loss

The t -test was used to determine whether a significant difference existed in self-esteem scores of Shape-Up program participants who either lost weight or did not lose weight during the program. As data in Table IV show, self-esteem mean scores at the beginning as well as at the end of the program were not significantly different for subjects who

either lost weight or did not lose weight ($p = 0.112$, $p = 0.620$). Therefore, the researcher failed to reject hypothesis two.

TABLE IV

RESULTS OF t -TEST FOR INITIAL AND FINAL SELF-ESTEEM SCORES FOR EXPERIMENTAL SUBJECTS WHO EITHER LOST WEIGHT OR DID NOT LOSE WEIGHT

	Initial		Final	
	Mean	S.D.	Mean	S.D.
Lost Weight	30.28	16.53	23.83	15.53
Did Not Lose Weight	38.00	7.35	27.83	16.40
t-Value	-1.649		-0.506	
p-Value	0.112		0.620	

Self-esteem scores were not significantly different between the losers and non-losers. However, data in Table IV show that the subjects who lost weight during the program began the program with a higher level of self-esteem (30.28), than those who failed to lose weight (38.00); the lower the score, the higher the self-esteem. Data in Table IV also show that the participants who lost weight, as well as the participants who did not lose weight, had an increase in

self-esteem.

Self-Esteem Scores for Experimental
Group versus Comparison Group

A t-test was used to determine whether a significant difference existed in the level of self-esteem of weight-loss program participants and the comparison group. As data in Table V show, initial self-esteem mean scores were not significantly different between the two groups ($p = 0.190$). Thus, the researcher failed to reject hypothesis three. Even though the two groups were not significantly different according to level of self-esteem, the experimental group had an observed higher score, thus indicating a lower self-esteem.

TABLE V
t-TEST RESULTS OF INITIAL SELF-ESTEEM
SCORES FOR EXPERIMENTAL
AND COMPARISON GROUPS

	Mean	S.D.
Experimental	32.81	14.37
Comparison	27.55	15.79
t-Value		1.34
p-Value		0.19

Self-Esteem and Category of Weight

Hypothesis four stated that there would be no significant relationship between body mass index (BMI) and self-esteem scores of individuals enrolled in a weight-loss program and those not enrolled. A simple linear regression model was used to test this hypothesis (Table VI). There was no significant correlation between BMI and self-esteem in either group ($p = 0.519$). Therefore, statistical analysis of the data failed to reject hypothesis four. Because it was not significant, no further testing was done.

TABLE VI

PRELIMINARY ANALYSIS TO DETERMINE EXISTENCE OF
LINEAR RELATIONSHIP BETWEEN INITIAL SELF-
ESTEEM SCORES AND INITIAL BODY MASS
INDEX FOR EXPERIMENTAL AND
COMPARISON GROUPS

Source	df	SS	MS	F-Value	P-Value
Model	3	540.54	180.18	0.76	0.519
Error	56	13216.04	236.00		
Total	59	13756.58			

Even though the relationship between the BMI and initial

self-esteem scores was not statistically significant, data in Table VII show that in both the experimental and comparison groups, overweight subjects had the highest score (lowest level of self esteem). An interesting finding was that obese subjects in both groups had the highest level of self-esteem.

TABLE VII
MEAN SELF-ESTEEM SCORES OF NORMAL WEIGHT, OVERWEIGHT,
AND OBESE SUBJECTS IN EXPERIMENTAL
AND COMPARISON GROUPS

Category of Weight	Body Mass Index	Self-Esteem Scores
<u>Underweight</u>		
Comparison Group, n = 2	16.50	24.50
Experimental Group, n = 0	-	-
<u>Normal Weight</u>		
Comparison Group, n = 9	22.22	25.56
Experimental Group, n = 14	22.86	31.36
<u>Overweight</u>		
Comparison Group, n = 14	27.07	31.71
Experimental Group, n = 13	26.46	37.09
<u>Obese</u>		
Comparison Group, n = 8	34.50	22.88
Experimental Group, n = 8	32.13	26.60

Note: Two subjects in the experimental group refused to be weighed.

Self-Esteem and Select Variables

A stepwise multiple regression procedure was used to determine if a relationship existed between self-esteem and select variables in the experimental group. Data in Table VIII show that no significant relationship was found ($p > 0.05$). Therefore, the researcher failed to reject hypothesis five.

TABLE VIII
MULTIPLE REGRESSION PROCEDURE FOR THE
DEPENDENT VARIABLE, SELF-ESTEEM,
FOR EXPERIMENTAL SUBJECTS

Independent Variable	n=35	R ^{2a}	p-Value ^b
Step 1 Beginning Weight		0.07	0.20
Step 2 Percent Weight Change		0.12	0.28
Step 3 Frame Size		0.13	0.55
Step 4 Reducing Diet		0.14	0.68
Step 5 Age		0.15	0.71
Step 6 Height		0.15	0.88

a-R² (accumulated values)
b-p-Value (point-of-entry)

Nutrition Knowledge and Health

Risk Appraisals

Hypothesis six stated that there would be no significant

difference in pre and post nutrition knowledge tests and health risk appraisal for the experimental group. As data in Table IX indicate, no significant difference existed for the experimental group on the pre-test and post-test scores ($p > 0.05$). Although the difference in mean health risk appraisal scores was not significant at the 0.05 level, it approached significance. This suggested that as the weight-loss program progressed, participants began to eliminate certain lifestyle risk factors that could adversely affect their health.

TABLE IX
 PAIRED t -TEST FOR PRE AND POST NUTRITION
 KNOWLEDGE AND HEALTH RISK SCORES
 FOR EXPERIMENTAL GROUP

	Mean	S.D.	t -Value	p-Value
Nutrition Knowledge (n = 10)	-0.10	2.42	-0.13	0.90
Health Risk Appraisals (n = 14)	-1.00	1.80	-2.08	0.06

Discussion

This study investigated the influence of a weight-loss

program on self-esteem. The researcher also examined the relationship between self-esteem and select variables (weight loss/no weight loss, body mass index, previous reducing diets, age, height, frame size, beginning weight, and percent weight change). The effect of a weight-loss program on nutrition knowledge and health risk factors was also examined.

Self-esteem is a multi-faceted, complex human characteristic. According to Anderson (1981, p. 11), "people may have different degrees of self-esteem in different situations or when they assume different roles." Furthermore, self-esteem is affected by many variables.

This study examined the relationship between self-esteem and weight-loss program participants. The researcher did not find a significant difference ($p > 0.05$) among repeated measures of self-esteem scores for participants of a weight-loss program. However, an examination of the data showed that mean self-esteem scores decreased (improved) throughout the eight-week program. A mean score of 32.8 was observed from the first meeting. A score above 30 indicates a problem with self-esteem. Scores gradually decreased over the weeks, until a final mean score of 23.80 was obtained at the last meeting. This score indicated that there was not a self-esteem problem.

Shape-Up is a weight-loss program which includes nutrition/exercise education, behavior modification, and weight management techniques. Therefore, it is possible that the increase in self-esteem was a result of knowledge

acquired from Shape-Up. Another possibility for the increase in self-esteem is that people who enroll in a weight-loss program may feel that they are doing something positive to improve their health and appearance.

Allon (1979) states that perhaps people need to have a positive self-image or some degree of self-esteem in order to be successful at losing weight. Similarly, Lynch and Clark (1985) report that individuals with low self-esteem tend to underestimate their ability to perform tasks. Their study shows that self-esteem is positively related to achievement, and that achievement of goals might be improved through changes in self-esteem.

The results of this study failed to show a significant difference ($p > 0.05$) in self-esteem between Shape-Up participants who lost weight and those who did not lose weight during the program. However, as suggested by other researchers, subjects who lost weight in this study started the program with an observed level of self-esteem which was higher than those who failed to lose weight.

Ramsey (1985) compared self-esteem scores of weight-loss program participants and homemakers who were not trying to lose weight. Likewise, self-esteem scores of Shape-Up participants were compared to self-esteem scores of homemakers who were not seeking to lose weight. Results of the two studies were similar; study data identified no significant difference ($p > 0.05$). However, in Ramsey's study, self-esteem scores of weight-loss program participants were slightly

higher than self-esteem scores of homemakers. In contrast, this study showed that observed self-esteem scores of the comparison group were slightly higher than that of the Shape-Up participants.

A literature search revealed a paucity of research regarding self-esteem and weight status in adults. Two researchers, Ramsey (1985) and Ludeman (1979), found a significant inverse relationship between the self-concept of women and their weight. Both studies indicated that as the degree of overweight increased, self-concept decreased. In addition, both researchers found that self-esteem decreased as degree of overweight increased, although differences were not statistically significant.

Several studies correlating self-esteem and weight have been conducted with children. Results were contradictory, but one study examined children in grades 3 through 8 (Wadden, Foster, Brownell, & Finley, 1984), and the researchers found no significant difference in the self-esteem of obese and normal weight children. This researcher found similar results among adults. There was no significant difference ($p > 0.05$) in the self-esteem mean scores of either the experimental or the comparison group with regard to category of weight. This researcher used body mass index (BMI) to categorize subjects according to weight.

Findings in this study conflict with the studies of Ramsey (1985) and Ludeman (1979), regarding the self-esteem of obese subjects. The results in this study indicate that

obese subjects in both the experimental and comparison groups had the highest level of self-esteem of any weight category (underweight, normal weight, and overweight). Self-esteem of the overweight subjects in both the experimental and comparison groups was the poorest. It appears that the obese individuals were not unhappy about their weight to the extent that it adversely affected their self-esteem. The self-esteem they have acquired in other areas of their lives may have compensated for their obesity.

The contradictory results of these studies emphasize the fact that self-esteem is affected by numerous variables. Thus it is difficult to blame low self-esteem on a single aspect of life, such as being overweight.

In this study, certain variables were examined concerning whether or not they had an effect on self-esteem. The variables were: beginning weight, percent weight change, frame size, previous reducing diets, age, and height. There was no significant relationship between self-esteem and any of the variables. These results illustrate the complexity of psychological evaluation and the difficulty in identifying the cause of low self-esteem.

Knowledge in health and nutrition does not necessarily guarantee good nutrition practices. Information is often disregarded, modified, and used to justify current behavior rather than to stimulate change. One of Shape-Up's major goals was to provide participants with the necessary information to enable them to make sound decisions about health.

This study compared pre and post-test nutrition knowledge scores of Shape-Up participants to determine if improvement occurred. The difference was not statistically significant ($p > 0.05$). The nutrition knowledge test was developed according to course content and Shape-Up objectives (Appendix E). Participants scored high on the pre-test, which was given at the first meeting. Eighty percent of the participants achieved a score higher than 84 percent. On the post-test, 81 percent achieved a score higher than 84 percent. One possible reason for the high scores on both tests was that people concerned about weight control already knew a great deal about nutrition, exercise, and weight-loss techniques.

Four of the most frequently missed questions on the true/false nutrition knowledge test were:

- T It is okay to have a glass of wine with dinner if you are trying to lose weight.
- T A broiled, lean, 3-oz. steak has less calories than a piece of fried fish.
- F Eating a meal from the salad bar is always a better choice (calorie-wise), than ordering a hamburger.
- F Candy, cookies, and chips are forbidden foods for people who are trying to lose weight.

Eighty-nine percent of the Shape-Up participants had been on at least one previous reducing diet. Again, being informed does not mean that people will make wise choices concerning their health.

Pre and post-test scores for health risk appraisal were also compared to determine if a significant difference existed. No significant difference existed between the scores, but observed scores showed an improvement. This "appraisal" was in the form of a checklist inventory which identified individual lifestyle risk factors affecting health, such as alcohol use, physical inactivity, neglected sleep habits, tobacco use, and so forth (Appendix D). The results suggested that exposure to a weight-loss program, which emphasized health, nutrition, and exercise might have motivated people to make positive changes in their health behaviors.

Most people value health so it is assumed that they will adopt a lifestyle conducive to assuring lasting health ("Nutrition Education's" 1985). Whether they do, however, depends on internal factors (nutrition knowledge, personality traits, anxiety, etc.) and external factors (cultural expectations, peer influences, cost of food, advertising appeals, etc.).

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Obesity is predominately a physiological disorder that has a poor treatment success rate (Atkinson, Russ, Ciavarella, Owsley, & Bibbs, 1984). Successful weight loss and maintenance requires major changes in lifestyle. Eating habits, physical activity, and psychological factors must be gradually changed. Allon (1979) reports that a negative body image may act as a deterrent in the weight-loss process. She suggests that individuals need a certain level of self-esteem in order for weight loss to occur.

This study investigated the differences in repeated measures of self-esteem on participants for the duration of a weight-loss program. Additionally, differences in self-esteem between subjects who either lost weight or did not lose weight were examined. The researcher also sought to determine if a significant difference existed between individuals who were enrolled in a weight-loss program and those who were not enrolled. The relationship of self-esteem to body mass index was investigated for both the experimental and comparison groups. Furthermore, the researcher examined the relationship between self-esteem and selected variables such as previous reducing diets, age, height, frame size,

beginning weight, and percent weight change. Finally, differences in pre and post-test nutrition knowledge and health risk appraisals were examined.

Characteristics of the Sample

A total of 70 men and women from two urban Oklahoma counties agreed to participate in this study. Thirty-seven were enrolled in the Shape-Up program and 33 were members of Oklahoma State University Cooperative Extension Homemaker clubs. Shape-Up participants were measured for height, weight, and frame size at each meeting. The Index of Self-Esteem was administered at the first, second, fourth, sixth, and eighth class. Participants completed registration cards which included demographic information. Members of homemaker clubs reported their own heights, weights, and ages and completed one Index of Self-Esteem at a monthly meeting.

All subjects were categorized as normal weight, overweight, or obese, based on their heights and weights. The total sample used for data analysis consisted of 37 Shape-Up participants (5 men and 32 women), and 33 members of homemaker clubs (all women).

Conclusions

The purpose of this study was to determine if participation in a comprehensive weight-loss program had an effect on the participants' self-esteem. An analysis of variance procedure showed that no significant difference existed in

the self-esteem mean scores obtained at five of the eight Shape-Up sessions ($p > 0.05$). However, observed self-esteem mean scores did improve from beginning to end of the program. Positive changes in self-esteem appeared to be the result of simply volunteering to participate in a nutrition study.

Self-esteem scores were also analyzed with a t-test procedure to determine if differences existed between participants who lost weight or did not lose weight. Differences were not significant ($p > 0.05$), but those subjects who lost weight during the program had a higher level of self-esteem at the beginning of the program than those subjects who failed to lose weight.

The difference in self-esteem mean scores of Shape-Up participants versus members of homemaker clubs was also analyzed with a t-test. Data analysis revealed that the two groups did not have significantly different levels of self-esteem ($p > 0.05$).

A simple linear regression model was used to determine if a relationship existed between mean self-esteem scores and body mass index (BMI) for Shape-Up participants and homemakers. Results of the analysis showed that no significant relationship existed ($p > 0.05$). However, examination of the data revealed that the obese subjects in both groups had the highest level of self-esteem (lowest scores) of any group. Overweight subjects had the lowest level of self-esteem (highest scores).

A stepwise multiple regression procedure was used to

determine if a significant relationship existed between self-esteem scores and select variables such as: previous reducing diets, age, height, frame size, beginning weight, and percent weight change. Analysis of the data showed no significant relationship between self-esteem and any of the select variables ($p > 0.05$).

One of the objectives of this study was to compare pre and post-test nutrition knowledge and health risk appraisal scores for participants of a weight-loss program. A paired t-test was used to analyze the difference in means of the scores. Results showed that pre and post-test nutrition knowledge scores were not significantly different ($p > 0.05$). Analysis of health risk appraisals also showed no significant difference at the 0.05 level of significance.

The sample utilized in this study was of adults in Oklahoma who participate in informal education programs. Self-esteem scores did improve from beginning to end of the weight-loss program which suggests that people begin to feel better about themselves when they are actively seeking to improve their health. It appears that a motivated group will make changes in health habits. Furthermore, the suggestion by Allon (1979) that self-esteem is needed before weight loss can occur is supported by the findings in this study.

The fact that pre and post-test nutrition knowledge scores were initially high, and did not change significantly, suggests that people who are trying to lose weight or improve their health habits already have nutrition knowledge, know

which foods are high in calories, and are knowledgeable about the benefits of exercise. Thus, other barriers prevent them from losing weight.

In contrast, differences in pre and post scores for health risk appraisals approached significance ($p = 0.06$). This finding suggests that exposure to a program based on health and fitness and identification of poor health habits motivates people to make positive changes in their health behaviors.

Recommendations for Future Research

The following recommendations are based on the findings of this study.

1. This study should be replicated with a larger sample of adults.
2. Compare repeated self-esteem scores of Shape-Up participants from two or more counties.
3. Study self-esteem scores of a large sample of obese subjects to determine whether findings from this study would be consistent with other studies.
4. Measure body mass index and self-esteem each month for six months following the Shape-Up program.
5. Develop a nutrition knowledge test that would include the cognitive, affective, and psychomotor domains of learning.
6. Conduct separate family Shape-Up programs for men, women, and children, and compare self-esteem scores.

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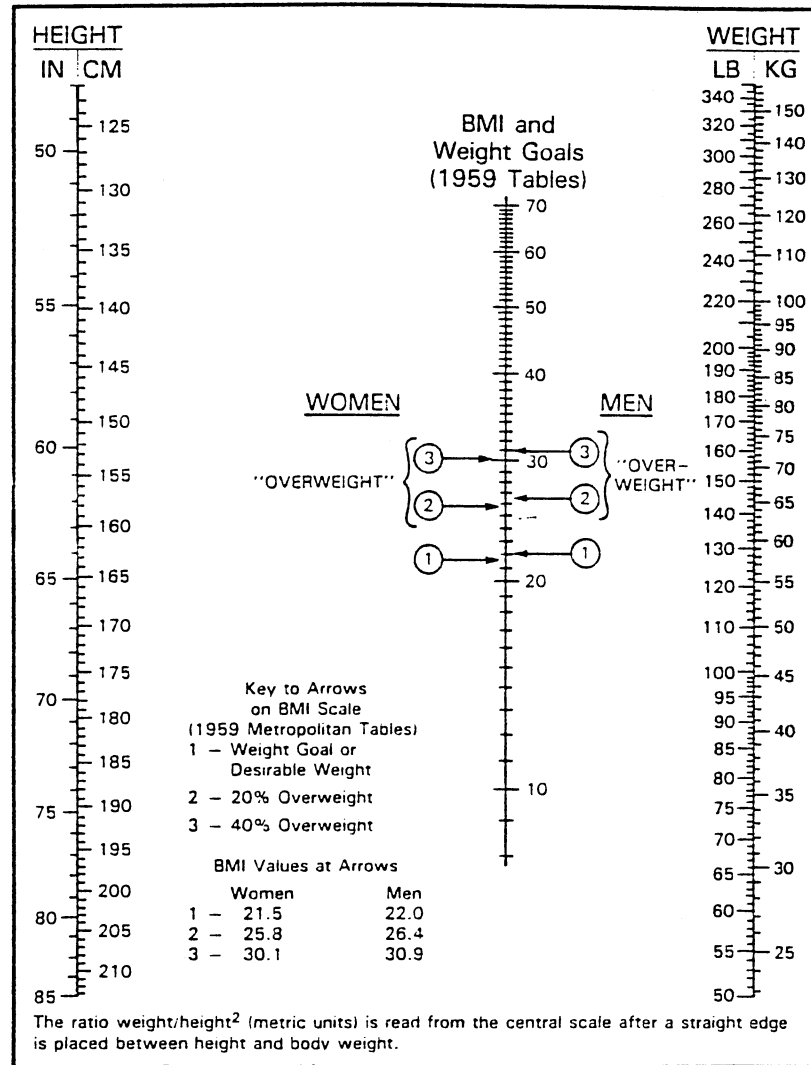
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APPENDIXES

APPENDIX A

AN EXAMPLE OF A NOMOGRAM FOR DETERMINING
BODY MASS INDEX



Source: Garrow, J. S. (1981). Treat obesity seriously. New York: Churchill Livingstone.

Figure 2. Nomogram for Determining Body Mass Index

APPENDIX B

INFORMED CONSENT FORM

INFORMED CONSENT

I volunteer to participate in a study of lifestyle patterns related to health and fitness of Oklahoma men and women. I realize that I will be asked to complete a Health Risk Appraisal Checklist and a Self-Esteem questionnaire. The instructors have my permission to record height and weight measurements. All information will be kept confidential.

Signature

Date

Address:

Telephone:

APPENDIX C

INDEX OF SELF-ESTEEM FORM

SAMPLE

Index Of Self-Esteem (ISE)

Today's Date _____

NAME _____

This questionnaire is designed to measure how you see yourself. It is not a test, so there are no right or wrong answers. Please answer each item as carefully and accurately as you can by placing a number by each one as follows:

- 1 = Rarely or none of the time
- 2 = A little of the time
- 3 = Some of the time
- 4 = A good part of the time
- 5 = Most or all of the time

Please begin.

1. I feel that people would not like me if they really knew me well. _____
2. I feel that others get along much better than I do. _____
3. I feel that I am a beautiful person. _____
4. When I am with other people I feel they are glad I am with them. _____
5. I feel that people really like to talk with me. _____
6. I feel that I am a very competent person. _____
7. I think I make a good impression on others. _____
8. I feel that I need more self-confidence. _____
9. When I am with strangers I am very nervous. _____
10. I think that I am a dull person. _____
11. I feel ugly. _____
12. I feel that others have more fun than I do. _____
13. I feel that I bore people. _____
14. I think my friends find me interesting. _____
15. I think I have a good sense of humor. _____
16. I feel very self-conscious when I am with strangers. _____
17. I feel that if I could be more like other people I would have it made. _____
18. I feel that people have a good time when they are with me. _____
19. I feel like a wallflower when I go out. _____
20. I feel I get pushed around more than others. _____
21. I think I am a rather nice person. _____
22. I feel that people really like me very much. _____
23. I feel that I am a likeable person. _____
24. I am afraid I will appear foolish to others. _____
25. My friends think very highly of me. _____

APPENDIX D

HEALTH RISK APPRAISAL FORM

Lesson 1: Health Risk Appraisal

Directions:

The following form is a checklist for various factors that have been identified as individual lifestyle risk factors affecting health. Place a check mark if these factors affect you.

- _____ Tobacco use (cigarettes, cigars, or smokeless tobacco)
- _____ Alcohol use (regular drinking)
non-drinker = less than one drink/week or no drinking
- _____ Neglected seat belt use
- _____ Body weight (10 pounds or more overweight)
- _____ Drugs (mood medication, relaxation medicine)
- _____ Physical inactivity (little or no physical activity/only occasional exercise)
- _____ Diabetes (type I or type II)
- _____ Neglected sleep habits
- _____ Stressful life (job loss, divorce, jail term, separation, disability, etc.)
- _____ High salt intake (frequent use of salt and salty foods)
- _____ High fat intake (frequent use of cream, whole milk, etc.)
- _____ High kcalorie level (excessive kcal level, greater than 2500 kcal/day for women or greater than 3500 kcal/day for men)
- _____ Family history (did either parent die of a heart attack before age 60?)
- _____ Diagnosed high blood pressure
- _____ Diagnosed high fasting lipid levels

Simplified Self-Scoring Instructions:

1. Count the number of check marks.
2. Record in the blank provided.

Post Test Score: _____

References:

1. Farquhar, J.W.; The American Way of Life Need Not be Hazardous to your Health, W.W. Norton Company, New York, NY, 1978.
2. Fitness 7 Program, Alabama Cooperative Extension Service, 1981.

APPENDIX E

NUTRITION KNOWLEDGE TEST

NUTRITION and EXERCISE

True or False

-
- 1. The most effective diet is one in which food intake is restricted to 800 calories per day.
 - 2. It is okay to have a glass of wine with dinner if you are trying to lose weight.
 - 3. A broiled, lean, 3-oz. steak has less calories than a piece of fried fish.
 - 4. Eating a meal from the salad bar is always a better choice (calorie-wise), than ordering a hamburger.
 - 5. Butter has more calories per tablespoon than margarine.
 - 6. Aerobic exercise can reduce blood pressure in some people.
 - 7. Skim milk has less calcium per cup than whole milk.
 - 8. Aerobic exercise speeds up your metabolism.
 - 9. To eat less, take small bites and chew thoroughly.
 - 10. Candy, cookies, and chips are forbidden foods for people who are trying to lose weight.
 - 11. Aerobic exercise can decrease cholesterol levels in the blood.
 - 12. Bread should be omitted from a weight-loss plan.
 - 13. Using smaller plates and glasses may influence one to eat less.
 - 14. It takes approximately 20 minutes for your brain to receive the signal that you are full.
 - 15. A health-food store is a good place to buy groceries if you are health conscious.
 - 16. People feel hungry right after they exercise.
 - 17. Many high-protein foods also contain fat.
 - 18. When trying to lose weight, you should limit water intake to two glasses per day.
 - 19. After an eating binge, you should not eat anything the next day.
 - 20. One disadvantage of aerobic exercise is that it puts a strain on a healthy heart.

APPENDIX F

DEMOGRAPHIC INFORMATION FORM

VITA ²

Cynthia Brasher Bailey

Candidate for the Degree of

Master of Science

Thesis: THE EFFECT OF A WEIGHT-LOSS PROGRAM ON PARTICIPANTS'
SELF-ESTEEM, NUTRITION KNOWLEDGE, AND HEALTH
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