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Reducing vulnerability for bulimia among college-aged women: Implementation of an educational model for prevention.

Jan Elliott Evans

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REDUCING VULNERABILITY FOR
BULIMIA AMONG COLLEGE-AGED WOMEN:
IMPLEMENTATION OF AN
EDUCATIONAL MODEL FOR PREVENTION

A Dissertation
Presented to
The Faculty of the School of Education
The College of William and Mary in Virginia

In Partial Fulfillment
Of the Requirements for the Degree
Doctor of Education

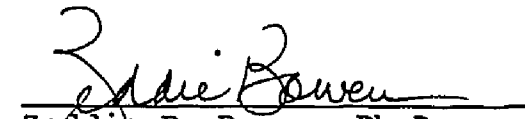
by
Jan Elliott Evans
April 1989

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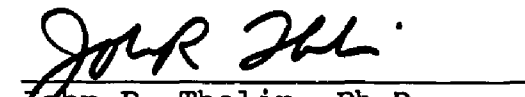
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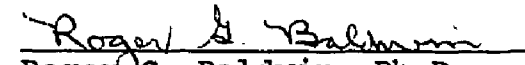
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This research project is dedicated
to my husband, who provided endless love and support
during these last five years of study,
to my mother, who is brilliant, multi-talented, and beautiful,
and who has been a shining example for me to emulate
during my life,
and to my father, who has always told me that there was
nothing in this world that I could not do.

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Chapter 1: Background of the Problem

Introduction

Prior to the twentieth century, adiposity (excess fat tissue on the body) was valued as a mark of affluence, beauty, and health. Today, obesity is no longer regarded with benevolence. Overeating and consequent overweight is now often regarded as a behavioral maladjustment. Societal emphasis upon physical appearance has placed overweight individuals at a great disadvantage in terms of attaining both their personal and professional goals. Certain health problems are associated with an excess accumulation of adipose tissue on the body, but certainly the problems suffered by the obese in today's society exceed those concerned with physiological health.

Obviously, the optimal weight and percentage of fat for an individual is that which is most conducive to health. What is unfortunate is that many young people assume that all fat is bad and are constantly seeking ways to eliminate fat from their bodies. This obsession with losing weight and maintaining minimal fat levels in the body has produced an epidemic of disordered eating; this is most apparent in teenagers and young adults. Perhaps what is happening is that an interest in fitness and overall health and well-being has been taken to an extreme.

This current interest in fitness and health has been accompanied by an equally enthusiastic interest in the science of nutrition. Education about nutrition and eating behavior is increasing in colleges and universities, but because of the high incidence of eating disorders observed on college campuses, it is sadly apparent that what is being offered is insufficient. Incorrect information about nutrition is also abundant and is contributing to the myriad of problems concerning nutrition and weight control that are observed.

And there is no longer any doubt: the incidence of eating disorders is rapidly increasing in the United States. The incidence of bulimia, an eating disorder commonly seen in college women, is believed to have reached epidemic proportions. It has been estimated that one third of the female college population is involved with bulimic behaviors (Adler, 1982). Ninety-five percent of young people affected by bulimia and other related eating disorders are women (Striegel-Moore, Silberstein, and Rodin, 1985).

Bulimia literally means "ox hunger" or "huge hunger" and involves severe dysfunction of eating behavior. Bulimic individuals will typically ingest enormous amounts of food and then try to control any perceived weight gain through selected evacuation techniques such as starvation dieting, laxative, diuretic or exercise abuse, and

vomiting. This cycle can occur up to twenty-five times per day in severe cases (Cauwels, 1983; Mitchell and Pile, 1981). The chaotic eating patterns have very little to do with food; in reality bulimic behavior is a symptom of a variety of other serious psychological disorders.

Research on bulimia has been directed toward identifying the multitude of factors involved in the development of the disorder as well as those involved in the dynamic disorder itself. While recent measures for treatment have allowed for objective assessment of symptoms, most are best-suited for inpatient administration, or tend toward identifying symptoms and behavior of the related disorder anorexia nervosa. They do not appear to be directed to the dimensions of diagnosis and treatment which have been hypothesized to be more fundamentally related to bulimia. In addition, bulimia has only recently been viewed as a distinct diagnostic entity (American Psychiatric Association, 1986). Research regarding it as an eating disorder in and of itself is therefore rare. Also, little research has been done concerning education's impact upon disordered eating.

Statement of the Problem and Purpose of the Study

The purpose of this study was to assess the effectiveness of an educational intervention program about the selected subjects of basic nutrition, body

composition, and management of eating and exercise behaviors on reducing attitudes associated with bulimia in women. Data on the occurrence of bulimia conclude that there is a marked preponderance of the eating disorder on college campuses (Boskind-White and White, 1983). Teachers and psychological services personnel are quite often the initial contacts for victims in the college setting. Information about healthful eating and exercise behaviors needs to be made available to vulnerable individuals before these behaviors become out of control. The institutional setting can be an ideal place for the dissemination of such information. Intervention and prevention strategies can be incorporated into the college curriculum through health education programs (Willard, Anding, and Winstead, 1983). An important issue with regard to institutional involvement is the role of the health educator in the administration of a prevention model for bulimia.

Related issues include the types of instructional methods or models that would be helpful (e.g. values clarification, contracting to practice new eating behaviors, and behavior modification). How bulimia is related to issues of self-esteem is also important. It seems logical to take advantage of the expertise of educators as a starting point for the creation of an

instructional and informational model for prevention of bulimia.

Importance of Study

The incidence of eating disorders of all types has increased explosively in the last decade. Bulimia among college-aged women appears to be occurring at a rate of epidemic proportion. Because of the variety of methods of treatment and also because of the lack of success of one treatment method over all others, individuals and organizations campus-wide need to become involved in the prevention of bulimia and related eating disorders. There are key individuals who are in a position to contribute to a possible solution. Most important on the college campus is the role of the classroom teacher, in particular the health educator, in the prevention of bulimia. One reason for this is that these professionals are in a position where exposure to the students can occur on a daily basis. A teacher can observe changes in a student's physical appearance or demeanor and perhaps intervene before the problem becomes serious enough to require medical and psychiatric intervention. Quite often a student will approach a teacher initially, especially if a teacher shows concern both in and out of the classroom. Also, if a teacher exhibits an understanding of the problem, and many health educators do, this may satisfy a student's need for education about bulimia before eating behavior

gets out of control. This understanding appears to be a critical factor in reducing the numbers affected by this life-threatening disorder. A teacher who is sensitive to the student and who exhibits an understanding of the problem can be extremely helpful. Without interaction at the student-teacher level, and without appropriate and thorough education, the problems associated with bulimia cannot begin to be addressed at other levels within the institution (Neuman and Halvorson, 1983). The department of health sciences or health and physical education department can offer courses or programs designed to provide information about problems concerning eating behavior. Research in the area of treatment for bulimia and other eating disorders with nutrition education is limited, but shows great promise at this time (Conner, Johnson, and Stuckey, 1984). The apparent explanation for this is that many young people do not know how to eat properly; either they have never learned, or their eating behavior has become so chaotic that they cannot break out of the vicious cycle. Educational information that includes what happens to the body as a result of the binge-purge behavior and about methods for correcting the problem from a nutritional standpoint needs to be provided (Long and Cordle, 1982). This approach may help individuals deal more realistically and effectively with erratic eating behavior.

Chapter 2: Review of Literature

Definition of the Syndrome

In 1982, Newsweek referred to 1981 as "the year of the binge-purge syndrome." This realization reflected the public's increasing awareness of a significant sociocultural phenomenon: the apparent sudden and dramatic increase of bulimia, an ill-fated response to society's emphasis upon physical appearance. Bulimic behavior is characterized by recurrent episodes of binge eating behavior, followed by overwhelming feelings of guilt and some type of evacuation technique such as vomiting or abuse of laxatives, cathartics, and diuretics (Cauwels, 1983). The stuff-purge practice is not a twentieth century phenomenon; the Roman Empire had vomitoriums so that citizens could eat enormous amounts of food, purge their bodies of this food, and return to the feast to continue the celebration. The sociocultural, psychological, and emotional ramifications of bulimia are new, however, and are of special concern to those in the education and health-related fields.

In 1980, bulimia became recognized as a psychiatric disorder in its own right (DSM III, 1980). As a result, there has been a proliferation of literature about bulimia as researchers attempt to describe the disorder, to identify factors associated with it, and to suggest

treatment approaches (Striegel-Moore, Silberstein, and Rodin, 1986). Many new developments concerning the disorder appear in the current literature, suggesting that progress is being made toward understanding pathogenesis, diagnosis, and treatment. It seems useful to draw together the current and sometimes disparate literature to form a working understanding of the problem.

The condition known as bulimia represents a change in the pattern of eating disorders. Symptoms that formerly were associated with anorexia nervosa (intentional self-starvation) and obesity are now commonly reported by individuals of normal body weight (Edelman, 1981). Many bulimics maintain a normal weight for the duration of the disorder, and this normal-weight eating disorder has an epidemic prevalence among young women. Bulimia frequently occurs in anorexia nervosa and obesity and less often in major affective disorders (depression, for example) (Lacey, 1984). Additionally, the eating disorder itself defies logic because the victim often maintains normal weight while ingesting enormous amounts of food. Victims engage in various evacuation techniques to dispose of the excess caloric intake. According to the literature, about 80 percent of victims resort to psychogenic (self-induced) vomiting (Lucas, 1982). Other methods include intermittent starvation, abuse of appetite suppressants or use of substances that promote intestinal motility, or

excessive exercise (Beaumont, 1982). Quite often, a combination of these techniques is employed to prevent or inhibit absorption of calories by the digestive system.

Although vomiting is the method of choice for evacuation by most bulimics, the absence of this symptom does not alter the diagnosis (Lacey, 1982). In other words, the victim does not have to use vomiting as an evacuation technique in order to be diagnosed as bulimic. The binge-eating pattern is the critical focal point of the disorder and should continue to be through prevention, intervention, and treatment.

Sociocultural Factors

Bulimia is primarily a woman's problem; ninety percent of those affected are women (Fairburn, 1980; Herzog, 1982). One key risk factor for developing bulimia is being female. A major question, then, is why women? Central to this analysis are the sociocultural factors that place women at greater risk for developing bulimia. Twentieth century society values attractiveness, and thinness in particular, therefore making obesity a highly stigmatized condition (Boskind-White and White, 1983). Studies suggest that these social norms affect women more strongly than men (Bruch, 1983; Garner and Garfinkel, 1980). Certain women in particular are compelled more significantly than others to be thin. At a very basic level, those women at greatest risk appear to be those who

have accepted and internalized most deeply our sociocultural mores about thinness and attractiveness. The more a woman believes that fat is bad and that thin is good, the more she will be distressed about overweight. In studies of attitudes about the relationship between attractiveness and success, bulimic women expressed greater acceptance of this relationship than non-bulimic women (Neuman and Halvorson, 1983). Bulimic women also seem to aspire to thinner ideal body size than do normal women (Andersen, 1981).

A source of influence with regard to how women internalize these attitudes differently is the subculture in which they live. Attitudes concerning body image, ideal weight, and obesity are intensified within certain strata. Women of higher socioeconomic status are more likely to be affected by trends of beauty and fashion (Baker, 1984). They therefore often exhibit greater preoccupation with weight. Obesity has traditionally been least punished and of greatest prevalence among lower socioeconomic groups. There does appear to be a relationship between social class and bulimia, but studies about this subject have only recently become available in the literature.

Certain environments also apparently increase risk. Boarding schools and college campuses have been thought to "breed" eating disorders such as bulimia (Halmi and Falk,

1981). Several factors may be involved here. Colleges campuses quite often represent those socioeconomic classes at greatest risk. Also, as stressful, self-contained environments, campuses may exacerbate the sociocultural pressures to be thin. The competitive environment found at this level of education may not only include competition for grades, but may also include competition regarding the attainment of a beautiful (thin?) body. Women's appearance is of greater importance than men's during the college years (Striegel-Moore, Silberstein, and Rodin, 1986).

Other subcultures may also amplify the sociocultural pressures to be thin, and as a result place their members at greater risk for bulimia. Important examples would be subcultures in which optimal weight is specified, explicitly or implicitly, for the performance of one's vocation. Dancers, models, athletes, and actors show a significantly greater incidence of bulimia and related eating pathology than individuals whose job descriptions and performances are unrelated to appearance (Garfinkel and Garner, 1981; Garfinkel and Garner, 1980; Pope and Hudson, 1986). The eating pathology seems not as related to the stressful nature of these vocations as it is to the emphasis upon weight and appearance. The emphasis upon maintaining an optimal weight in certain athletic endeavors such as wrestling may soon result in an increase

in the incidence of bulimic behavior among males (Pope and Hudson, 1986). Certain athletic activities may be associated with a degree of dissatisfaction with body weight and body image and, as a result, repeated attempts at dieting.

Beauty ideals in Western culture have varied to a considerable degree over the centuries, and women have been willing to alter their physiques to conform to these ideals. It has been proposed that being concerned with one's appearance and making efforts to enhance and preserve one's beauty are central features of the female sex-role stereotype (Chernin, 1981). Physically attractive women are perceived as more feminine and unattractive women as more masculine (Beaumont, 1981). Interestingly, there also appears to be a relationship between certain types of eating behavior and femininity. In one study, women who ate smaller meals were described as being significantly more feminine than women who ate large meals, whereas the descriptions of meal size had no effect when rating men (Lucas, 1982). So then: can dieting behaviors and the pursuit of thinness be equated with the pursuit of femininity? For women who endorse the traditional sex role stereotype, being attractive and thin would be important because these attributes figure significantly into the values associated with being female. What is also important, though, is that women who

have abandoned many of the traditional female roles and have achieved occupational success also obsess about their weight. One possible explanation is that a svelte physique is the antithesis of the womanly shape that is associated with the maternal role. Also, women's orientation to success may be another possible explanation. In setting high standards, thinness may represent success in terms of personal accomplishment. It may be difficult for women to totally abandon femininity, so that looking feminine while being successful in their chosen occupation may be important to the "sense of self" (Garner and Garfinkel, 1978).

Given the central role of physical attractiveness in the Western world today and the association of thinness with femininity, it might be expected that those women who endorse the female sex role most strongly would be at greatest risk for developing bulimia. Clinical records of bulimic patients do tend to suggest that these women show typically "feminine" characteristics (being dependent, unassertive, eager to please, concerned with social approval) (Cooper and Fairburn, 1984). Perhaps bulimia is, in some cases then, the result of a struggle to attain some feminine ideal. One problem with this approach in the research, however, is the fact that the terms "masculine" and "feminine" have very different societal connotations than they did as recently as ten years ago.

As a result, these terms will have to be defined very carefully when used in current research about eating disorders.

Body Image and Self-Esteem

One characteristic that recurs consistently with pathological eating behavior is the victim's incorrect and exaggerated report of body size and body image (Garner, 1981). Most victims exhibit a distorted body image in that they tend to overestimate their body size, both of the figure as a whole and of specific body parts. Typically, the fat-bearing areas such as the waist, hips, and thighs are exaggerated. Also important is that while the victim can correctly judge others' appearances, they often grossly exaggerate the size and imperfections of their own bodies. In studies comparing estimation of body size by men and women, men were significantly more accurate than women in estimates of their own physiques (Garner, 1981; Pearlson, Flournoy, Simonson, and Slavney, 1981).

A related issue that has thus far been implicit is the association between body image and self-esteem. Self-concept theories have suggested that dissatisfaction with one's physical self will result in lowered self-esteem (Secord and Jourard, 1953). Relatively few studies have looked at the relationship between body image and self-esteem, but with such societal emphasis on attractiveness

in women, it would be expected that a woman's physical appearance would generally have more influence upon self-esteem than would a man's. The relationship between body weight as a component of body-image and self-esteem deserves further investigation in light of the extensive range of pathological eating behaviors found in society today.

Biological Factors

Biologically, women's bodies contain a higher percentage of adipose tissue than men's. Puberty, pregnancy, and menopause are three times in a woman's life when adipose tissue may increase by a significant amount. Women have a lower resting metabolic rate than men, and as a result require fewer calories for the physiological functions that sustain life. The difference is due in part to the size differences between men and women, but it is mainly due to the lower ratio of lean to fat tissue in women. Lean tissue (muscle) is more metabolically active than is adipose tissue and thus contributes to men's higher resting metabolic rate. With aging, sex differences with regard to metabolic rate may actually increase. So does the amount of adipose tissue, with an accompanying decrease in lean tissue. These differences are generally more pronounced in women than they are in men. Two observations are important here. First, when women are constantly trying to eliminate fat from their

bodies through some kind of pathological eating or exercise behavior, they are fighting nature, or biology. It is normal for women to have adipose tissue on their bodies. Therefore, along with the denial of biology through the struggle to lose fat comes a life-long compromise of overall physiological health and well-being. Second, it appears that women's battle with weight, both physiologically and psychologically, lasts a lifetime. The difference in adiposity between the sexes increases dramatically across the lifespan.

Specific differences in weight are also genetically determined. One method by which heredity may influence weight is that it determines the rate and ways in which food is metabolized (Boakes, Popplewell, and Burton, 1987). Individual differences in metabolism and caloric assimilation are often quite dramatic, even in subjects matched for age, sex, weight, and activity level (Hsu, 1986). Women who are genetically programmed to be heavier than the ideal may be at greater risk for developing bulimia than those women who are naturally thin. In addition, a genetic predisposition for an eating disorder may be transmitted (Yager, 1982). A significant number of women must deal with a frustrating paradox: a societal ideal of slimness and their own genetic predisposition toward a higher body weight.

Many women will resort to dieting to lose the unwanted pounds. Experts now believe that dieting is not only an ineffective method for attaining long term weight loss, but that it may in fact contribute to subsequent binge eating and weight gain (Wardle, 1980). A substantial decrease in caloric intake will result in a decreased metabolic rate and this will impede weight loss. Furthermore, upon resuming normal calorie intake, metabolic rate may remain decreased for some time, causing a weight gain that would not have occurred prior to the attempted caloric restriction. This phenomenon occurs along with some other metabolic and physiological changes when food intake is restricted. The end result is that dieting may produce effects that are quite the opposite of those intended. It seems entirely possible, then, that a prolonged history of dieting may constitute yet another risk factor for bulimia (Striegel-Moore, Silberstein, and Rodin, 1986). Women who have experienced repeated, unsuccessful attempts at weight loss may be most vulnerable to attempts at other weight loss strategies, including purging. It can be concluded that food restriction may be a critical precedent to the binge-eating behavior associated with bulimia. In support of this statement, the clinical literature suggests that in a great many cases, bulimia was preceded by a period or

periods of restrictive dieting (Johnson and Larson, 1982; Mitchell and Pile, 1981; Wooley and Wooley, 1982).

Family Characteristics

With some limited exception, the literature on bulimia has not reported on the role of certain family characteristics that might be predisposatory. Some hypotheses are presented in the limited materials that are available. One is that a daughter's risk for bulimia is relatively increased if the family heavily emphasizes thinness and physical appearance (Yager, 1982). Also important is the perpetuation of the myth that body weight is under volitional control and that the daughter is solely responsible for regulating her weight. If family members, particularly females, model weight preoccupation and dieting, and if these family members compete with regard to the achievement of the ideal physique, then the daughter is probably at greater risk. Another risk factor may derive from the way in which the family operates. Families with a bulimic member may share similarities with Minuchin's "psychosomatic families" (Minuchin, Rosman, and Baker, 1978). These similarities include enmeshment (emotional over-involvement), rigidity, over-protectiveness, and lack of conflict resolution (Minuchin, Rosman, and Baker, 1978). Bulimic families are also reported to exhibit heightened consciousness of appearance (Yager, 1982).

Ideals for Fitness and Beauty

It is essential to determine why bulimia is occurring with an epidemic frequency at this particular time in history. One reason is that the beauty ideal for women has shifted toward an increasingly thin standard. Current sociocultural influences tell women not only what the ideal physique should be, but how to attain it. This includes subliminal information concerning use of disregulated (chaotic) eating behavior as well as information on diet, exercise, and the like. The massive weight control industry almost prescribes these pathological rituals. An important example is the Beverly Hills Diet, created by Judy Mazel (1981) where binges are compensated for by eating foods that cause diarrhea and diuresis. In addition, females literally teach each other how to diet and purge. Thus, the more women there are with disordered eating, the more likely there are to be even more women who develop pathological eating behaviors (Boskind-White and White, 1985).

Bulimia in Men

Although significantly fewer men than women currently display bulimic symptoms and behavior, bulimic men do exist. Unfortunately, the numbers appear to be increasing. Surely our society's fitness consciousness applies as much to men as it does to women. Light beer, diet soft drinks, and other diet products are already

being marketed to appeal to men. As men become more conscious of weight and appearance, it can be expected that they will diet more and may succumb to the repeated effects of gaining and losing weight that make some people vulnerable to the development of eating disorders. Beyond the general pressure to be conscious of appearance, certain groups emphasize weight standards and as a result may place men at greater risk. Initial research does show that athletes such as wrestlers and jockeys exhibit a higher incidence of bulimia than male athletes in sports without weight restrictions (Striegel-Moore, Silberstein, and Rodin, 1986). Homosexual men, whose subculture promotes heightened attentiveness to physical appearance and a thin ideal, may also be at risk (Herzog, 1984).

Summary

Bulimia and psychogenic vomiting are symptoms of deep emotional and psychological dysfunction (Andersen, 1981; Lucas, 1982). As a result, prevention must not only deal with the physical consequences of bulimia but also with the underlying predisposatory emotional factors. Perhaps what is most important is that the heterogeneity of the disorder argues against unidimensional modes of prevention and treatment. It is not enough to be attentive to the pathological eating behavior while the underlying emotional turmoil remains unacknowledged. Nor is it sufficient only to provide insight-oriented therapy while

the victim remains symptomatic; severe bulimic behavior can be life-threatening. As the eating disorder begins to be controlled through behavior therapy and nutrition education, masked symptoms such as low self-esteem, depression, and anger begin to surface and must be acknowledged so that the pathological eating and evacuation behaviors are not resumed (Connors, Johnson, and Stuckey, 1984).

The effects of nutrition education, both as a preventive measure and as part of a treatment model, invite further study. Apparently, knowledge of the deleterious effects of bulimic behavior on health can be of significant value during treatment (Willard, Anding, and Winstead, 1983). This type of intervention can also facilitate a change in eating patterns, thereby enabling the individual to control abnormal eating behavior. In some cases, individuals have never learned to eat normally and must be provided with alternatives to the "all or none" approach to eating behavior. Standardizing eating patterns (e.g. time, place,) may be important; re-socializing mealtime is also significant since most binge eating is done in solitude. Guidelines for meal management and healthful dietary measures should be part of an active approach to providing education about eating behavior. Hopefully, as strategies for change in these

areas are developed, the prevalence of the eating disorder known as bulimia will decrease.

Chapter 3: Methodology

Sample

The sample for this study included one hundred fifty residential, first year women at The University of Richmond in Virginia. With permission, a listing of all first year women was obtained from the University Registrar. Two hundred seventy-seven women were randomly selected, contacted by telephone, and invited to be subjects in the study. One hundred sixty-four agreed to participate. One hundred fifty subjects attended the first session and the total number in attendance at the final session was one hundred twenty-nine.

Data Collection Procedures

All subjects were asked to sign a consent form (Appendix A,B) and then completed the Body Cathexis Scale as a pre-test. On the basis of the results from the pre-test, a group of subjects was identified as being at risk for bulimia and was then divided into two subgroups. Those subjects who were identified as "normal" by their scores on the Body Cathexis Scale were also divided into two subgroups. All subgroups were divided randomly into subgroups according to the computerized randomization schedule listed as Appendix D,E. One at risk group and one "normal" group was exposed to the educational intervention program (Appendix F) which consisted of four one-hour

sessions administered over a period of four weeks. The intervention took place in a typical classroom setting and consisted of a traditional educational experience. The cognitive material that was covered included information about basic nutrition and body composition, and instructions for appropriate eating and exercise behaviors. Each session lasted approximately one hour, with the first forty-five minutes specifically dedicated to the dissemination of information and the remaining time allotted for questions by the subjects about the information presented. The material was delivered in lecture fashion to the subjects in a large classroom on the campus at the University of Richmond. The Body Cathexis Scale was re-administered as a post-test to all subjects upon completion of the intervention program.

Interviews were conducted during the final session following completion of the post-test with randomly selected students who had participated in the intervention program. The purpose of the interviews was to enrich the information gained from the use of the Body Cathexis Scale, and to focus upon the impact of the contents of the intervention program. Interview questions are presented as Appendix G.

Instrumentation

The instrument that was used is the Body Cathexis Scale, presented as Appendix C. This instrument was

designed to measure attitude toward one's body. The term cathexis means "the degree of satisfaction or dissatisfaction with the various parts or processes of the body" (Secord and Jourard, 1953). The scale also measures general self-cathexis or self-esteem. It may be helpful in determining level of satisfaction with one's body, discovering the extent to which the level of self-esteem is associated with the level of satisfaction with one's body. P.F. Secord and S.M. Jourard designed the Body Cathexis Scale in 1953. Further testing of this instrument has shown reliability to be at .92 and validity to be at .66 in studies using females exclusively. The interview questions were designed for this particular study and were based upon the Body Cathexis Scale and the information provided in the intervention. These questions were pilot tested in September of 1988 on the campus of the University of Richmond with fourteen female members of the senior class.

Research Questions and Statistical Hypotheses

The questions that were investigated by this study are:

- 1) Can education play a role in enhancing positive feelings about the physical self among college women?
- 2) What are the distinctive attributes of an educational approach that alters attitudes and behaviors associated with bulimia?

Subsidiary questions that were considered are:

- 1) What are the contents of the educational intervention; what information is shared?
- 2) What is the nature of the student-teacher relationship in this particular educational intervention?

The research hypotheses that were investigated are:

- 1) Education about proper nutrition, body composition, and eating and exercise behaviors can alter attitudes associated with the eating disorder known as bulimia.
- 2) Positive changes in self-esteem, as measured by the Body Cathexis Scale, occur following exposure to an educational intervention program containing information about proper nutrition, body composition, and management of eating and exercise behaviors.

Experimental Design

Primary null hypothesis: The population mean improvement on the Body Cathexis Scale for the invention group is equal to the population mean improvement for the no intervention group.

Primary alternate hypothesis: The population mean improvement on the Body Cathexis Scale for the intervention group is not equal to the population mean improvement for the no intervention group.

Null hypotheses: The at risk population mean improvement on the Body Cathexis Scale for the

intervention group is equal to the at risk population mean improvement for the no intervention group.

The normal population mean improvement on the Body Cathexis Scale for the intervention group is equal to the normal population mean improvement for the no intervention group.

Alternate Hypotheses: The at risk population mean improvement on the Body Cathexis Scale for the intervention group is not equal to the at risk population mean improvement for the no intervention group.

The normal population mean improvement on the Body Cathexis Scale for the intervention group is not equal to the normal population mean improvement for the no intervention group.

Analysis

Body Cathexis Scale scores for all subgroups were analyzed using a two-way analysis of variance (type of subject: normal vs. at risk, and type of treatment: treated vs. non-treated). Supplementary analyses included t-tests on change scores for each type of subject separately with no adjustment for the pre-test, and a one-way analysis of variance with adjustment for pre-test scores. Treatment and non-treatment group means after adjusting for the differences in pre-test scores were also presented. Responses obtained from the interviews with

randomly chosen subjects were used to elaborate upon the findings of the quantitative data analysis.

Summary

One hundred-fifty first year women at The University of Richmond were invited to participate in a four week educational intervention program designed to enhance self-esteem and foster positive feelings about the physical self. The nutritional program presented was directed toward education to prevent chaotic eating and exercise behaviors among young women. Quantitative and qualitative data were collected in order to determine the effects of a program of this type on statistically "normal" women, and women found to be at risk for developing the eating disorder bulimia. A two-way analysis of variance and a compilation of answers to selected interview questions were used to analyze responses.

Chapter 4:

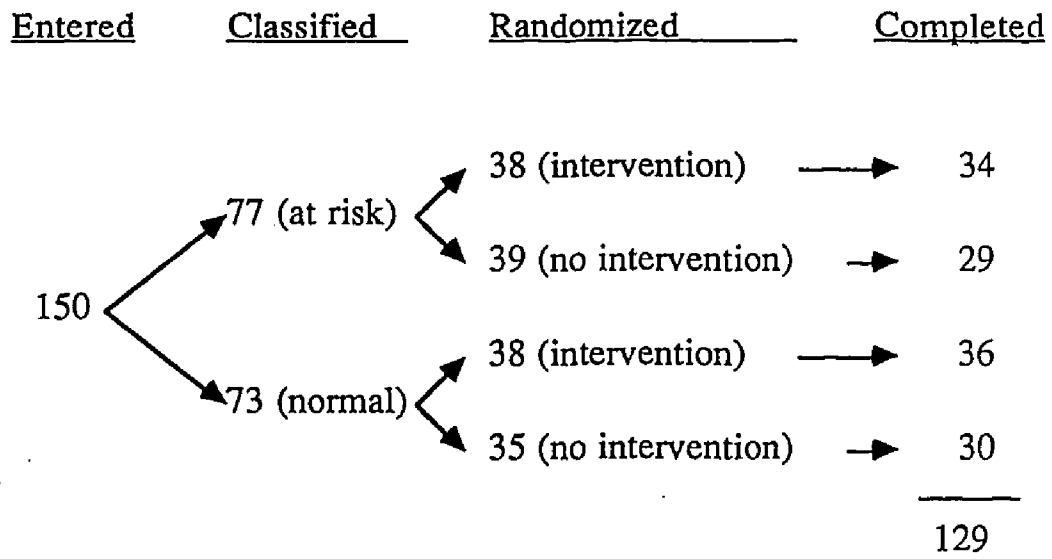
Findings and Discussion: Body Cathexis Scale and Interview Data

Once again, the main purpose of this study was to assess the effectiveness of an educational intervention program upon the attitudes associated with bulimia in college-aged women. In particular, the research considered the effects of education about the selected subjects of basic nutrition, body composition, and management of eating and exercise behaviors upon these attitudes.

Description of the Sample

All of the 129 students who participated in the study were females and were in their first year of study at the University of Richmond in Virginia. These students represented a random sampling of the first year class at the institution and therefore represented a wide variety of interests and majors while having the similarities that are associated with matriculating at the University of Richmond (race, religious affiliation, and socioeconomic status, for example). Table IV.1 displays the total sample according to their classification (normal or at risk) and whether or not they were exposed to the educational intervention.

Table IV.1
Description of the Sample



Hypotheses

Primary null hypothesis: The population mean improvement on the Body Cathexis Scale for the intervention group is equal to the population mean improvement for the no intervention group.

Primary alternate hypothesis: The population mean improvement on the Body Cathexis Scale for the intervention group is not equal to the population mean improvement for the no intervention group.

Subsidiary Hypothesis: The population mean improvement on the Body Cathexis Scale for both the normal and at risk intervention subgroups is not equal to the population mean improvement for both the normal and at risk no intervention subgroups.

Summary of Subject Participation in the Study

Data on the number of subjects who completed the study are displayed in Graph IV.1. the number of subjects who dropped out before the completion of the study are summarized in Table IV.2 and Graph IV.2 for each type of intervention group within both subject strata (at risk and normal). For both at risk and normal subjects, a larger number of subjects randomized to the no intervention groups dropped out. For the at risk population, there were 4 dropouts (10.5 percent) from the intervention group and 10 dropouts (25.6 percent) from the no intervention group.

GRAPH IV.1
PERCENT OF SUBJECTS WHO COMPLETED THE STUDY

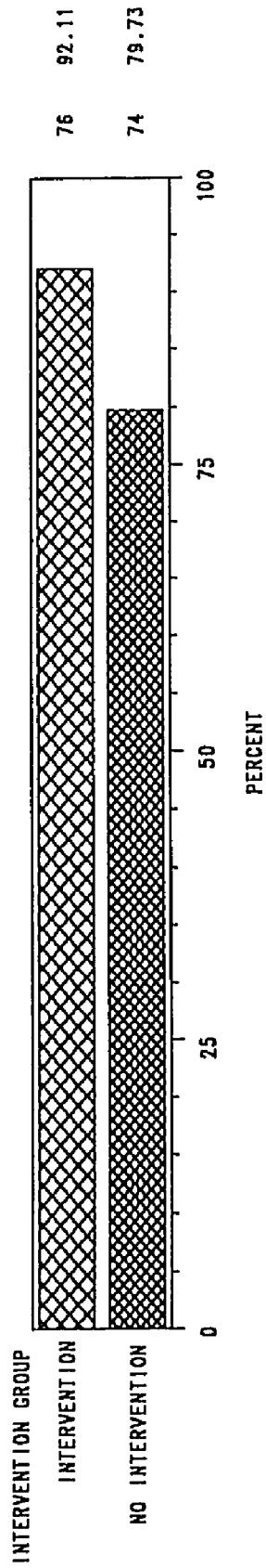
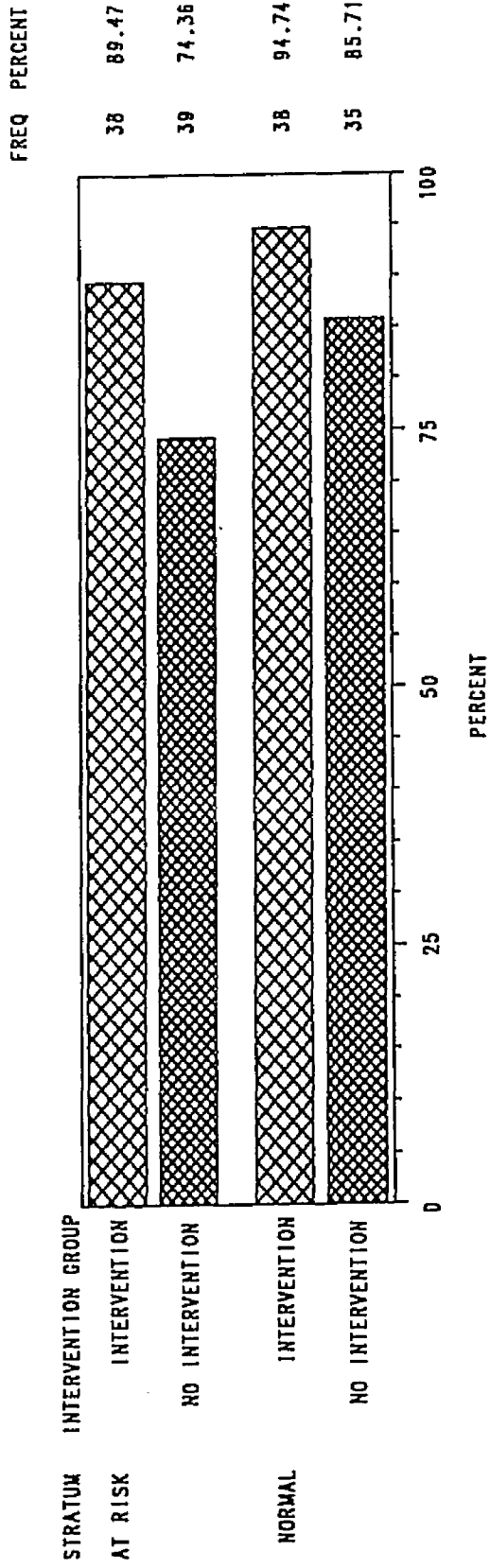


Table IV.2
 Summary of Cochran-Mantel-Haenszel Chi-Square Analysis:
 Subjects Who Did Not Complete the Study

<u>Analysis Group</u>	<u>Subject Stratum</u>	<u>Intervention Group</u>	<u>N</u>	<u>Dropouts</u>		<u>P-value</u>
				<u>Number</u>	<u>Percent</u>	
All Subjects	At Risk	Intervention	38	4	10.5	0.088
		No Intervention	39	10	25.6	
	Normal	Intervention	38	2	5.3	0.194
		No Intervention	35	5	14.3	

GRAPH IV.2
 PERCENT OF SUBJECTS WHO COMPLETED THE STUDY SUMMARIZED BY STRATUM



For the normal population, there were 2 dropouts (5.3 percent) from the intervention group and 5 dropouts (14.3 percent) from the no intervention group.

System For Analysis

All data analyses were done on the Statistical Analysis System (SAS), software package version 5.18. The package was provided by SAS Institute, Incorporated, and operated by Dr. Charles W. Kish, Jr.

Primary Analysis

The primary analysis consisted of a two-factor analysis of variance. The interaction on change in Body Cathexis score between subgroups was insignificant. This means that the difference between the intervention and no intervention subgroups within the at risk strata is basically the same as the difference between the intervention and no intervention subgroups within the normal strata. The response variable was change in cathexis scale scores as the score after intervention minus the score before intervention. The independent variables were subject stratum (so named because of the stratified randomization schedules used to group subjects) and intervention group. The levels of subject stratum were at risk and normal. The levels of intervention groups were intervention and no intervention. Differences between the intervention groups were calculated for each

Table IV.3
Summary of Two-Factor Analysis of Variance with Interaction on
Change in Body Cathexis Score

<u>Analysis Group</u>	<u>Subject Stratum</u>	<u>Intervention Group</u>	<u>N</u>	<u>Baseline Mean</u>	<u>Change (after-baseline) Mean</u>	<u>P-value</u>
Completers (a)	At Risk	Intervention	34	2.89	0.22	0.0001
		No Intervention	29	3.20	0.04	
	Normal	Intervention	36	3.96	0.13	0.0029
		No Intervention	30	3.85	0.00	
All Subjects (b) (no change)	At Risk	Intervention	38	2.94	0.20	0.0001
		No Intervention	39	3.15	0.03	
	Normal	Intervention	38	3.95	0.12	0.0018
		No Intervention	35	3.83	0.00	
All Subjects (c) (worst case)	At Risk	Intervention	38	2.94	0.20	0.0001
		No Intervention	39	3.15	0.04	
	Normal	Intervention	38	3.95	0.12	0.0028
		No Intervention	35	3.83	0.00	

(a) Primary analysis was performed on completers.

(b) Intent-to-treat analysis was performed on all subjects to assess impact of dropouts on the primary analysis: all dropouts were assigned a change score of 0.

(c) Intent-to-treat analysis was performed on all subjects to assess impact of dropouts on the primary analysis: dropouts in the Intervention groups were assigned a change score of 0; dropouts in the No Intervention groups were assigned a change score of 0.04.

stratum. A summary of the results of the analysis is presented in Table IV.3, part a. For both strata, the intervention group exhibited a statistically significant greater increase in cathexis scale scores compared with the no intervention group. For the at risk stratum, the mean change for the intervention group was 0.22 compared with a mean change of 0.04 for the no intervention group. The probability of obtaining a difference of this size by chance was estimated to be 0.0001. For the normal stratum, the mean change for the intervention group was 0.13 compared with a mean change of 0.00 for the no intervention group. The probability of obtaining a difference of this size by chance was estimated to be 0.0029.

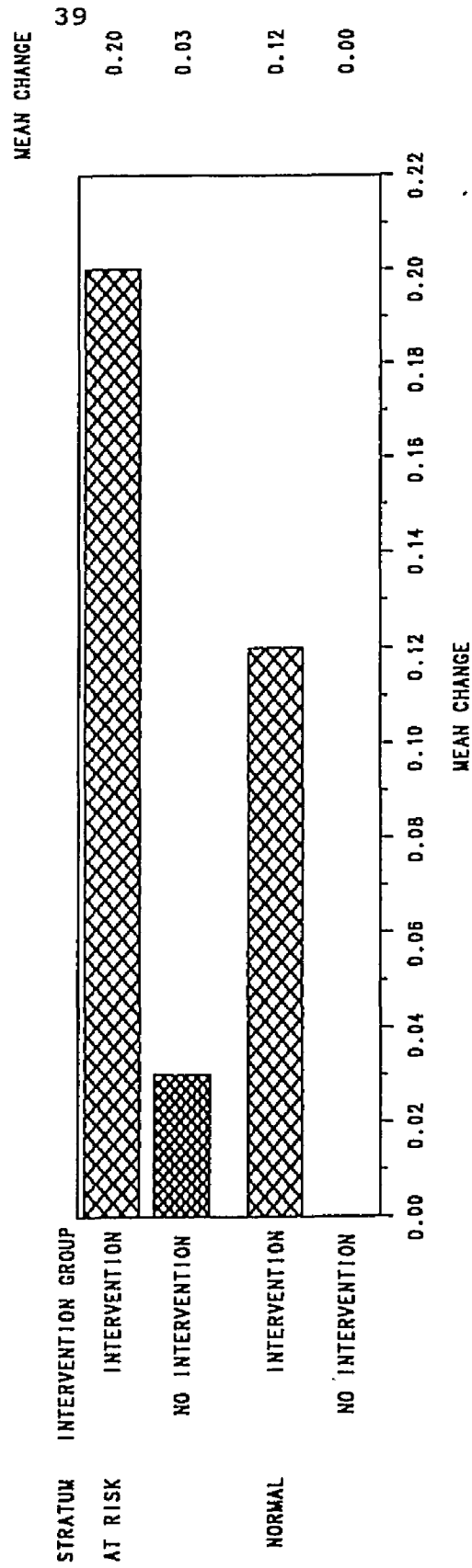
The findings of the primary analysis are quite dramatic and invite further inquiry. It is apparent from the analysis that those who participated in the intervention had more of a tendency to remain in the program for the duration of the study than did those in the no intervention subgroups. Also, those who participated in the intervention had significantly greater improvements in Body Cathexis Scale scores than those subjects in the no intervention subgroups.

Supplemental Analyses

Two separate supplemental intent-to-treat analyses were performed to assess the impact of dropouts on the

primary findings. The first analysis assigned a change score of 0 (no change) to each dropout. The second supplemental analysis assigned a score of 0 (no change) to each dropout in an intervention group and a score of 0.04 to each dropout in a no intervention group. This may be considered a "worst case" situation for the intervention group. The value of 0.04 for the assigned change to no intervention subjects was chosen because it is the value of the largest mean improvement for either no intervention group. Results from both intent-to-treat analyses, presented as Table IV.3, parts b and c, and in Graphs IV.3 and IV.4 were in agreement with the primary analyses. The first analysis (Table IV. 3, part b and Graph IV.3) showed that had an hypothetical score of no improvement been assigned to the dropouts, the effects upon the comparisons would have been insignificant with regard to the results from the primary analysis. The second analysis (Table IV.3, part c and Graph IV.4) created a worst possible case for the investigation in that a score of no improvement was assigned to each dropout in the intervention subgroups and each dropout in the no intervention subgroups was assigned an improvement score that was the average of the most improvement found in the study. The results from this intent-to-treat analysis were also insignificant with regard to the findings of the primary analysis. In other words, if all

GRAPH IV.3
 MEAN CHANGE IN BODY CATHEXIS SCORE
 SUBJECT GROUP: ALL SUBJECTS
 SCORING FOR DROPOUTS: NO IMPROVEMENT, CHANGE=0



STRATUM INTERVENTION GROUP
 AT RISK INTERVENTION
 NO INTERVENTION
 NORMAL INTERVENTION
 NO INTERVENTION

0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 0.18 0.20 0.22
 MEAN CHANGE

MEAN CHANGE

39

0.20
0.03
0.12
0.00

GRAPH IV.4
MEAN CHANGE IN BODY CATHESIS SCORE
SUBJECT GROUP: ALL SUBJECTS
SCORING FOR DROPOUTS: INTERVENTION GROUP - NO IMPROVEMENT, CHANGE=0
NO INTERVENTION GROUP - IMPROVEMENT, CHANGE=0.04
(WORST CASE SITUATION)

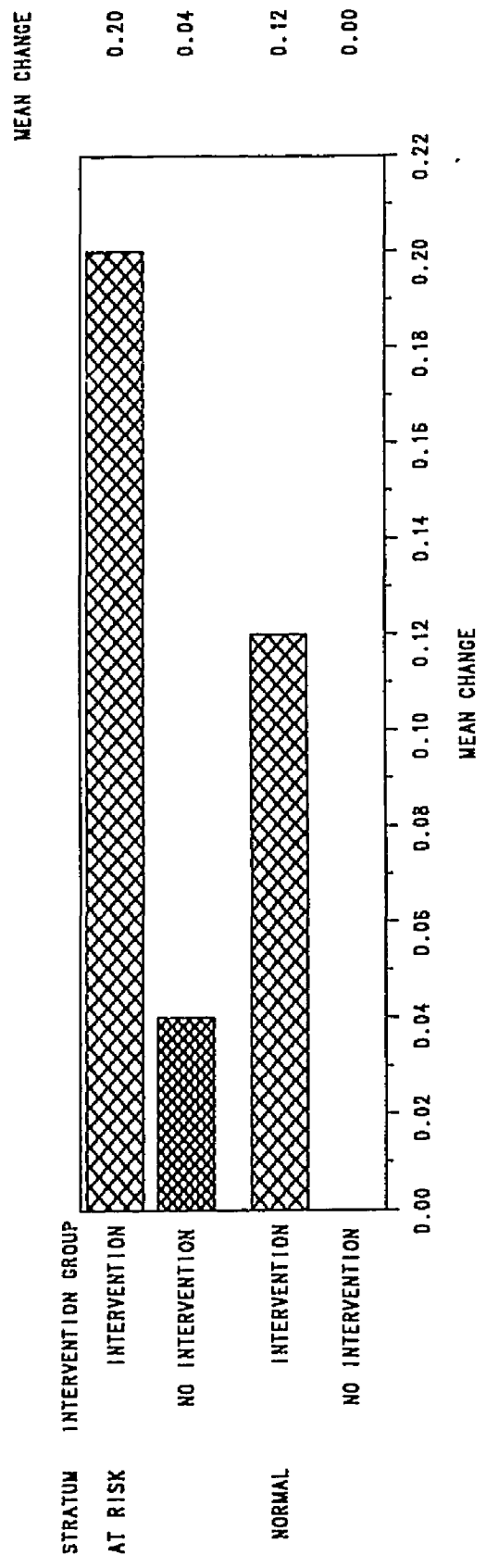


Table IV.4

Summary of Analysis of Covariance of Change in Body Cathexis Score (a)

<u>Analysis Group</u>	<u>Subject Stratum</u>	<u>Intervention Group</u>	<u>N</u>	<u>Baseline Mean</u>	<u>Adjusted Change (after-baseline) Mean</u>	<u>P-value</u>	
Completers (b)	At Risk	Intervention	34	2.89	0.21	0.0003	
		No Intervention	29	3.20	0.02		
	Normal	Intervention	36	3.96	0.14		0.0019
		No Intervention	30	3.85	0.00		
Completers (c)	At Risk	Intervention	34	2.89	0.21	0.0008	
		No Intervention	29	3.20	0.05		
	Normal	Intervention	36	3.96	0.14		0.0016
		No Intervention	30	3.85	-0.01		

(a) One-way analysis of covariance was performed to assess impact of baseline scores on the primary analysis. The mean change for each intervention group is adjusted for the difference in mean baseline scores.

(b) Within each stratum, separate slopes were estimated for the intervention groups.

(c) Within each stratum, a single slope was estimated for both intervention groups.

of the dropouts had scored according to the intent to treat analysis in the actual study, the findings would have been unaffected from a statistical standpoint. Therefore, a statistically significant difference between the intervention and no intervention groups would still result.

Analysis to Account for Baseline Score Differences

The subjects were given a pre-test and divided into subgroups according to their scores on this pre-test. Those subjects with a lower score (below 3.0) on the Body Cathexis Scale were labeled as at risk subjects and those with a higher score were labeled as normal. Consequently, those subjects deemed to be at risk began the study with a lower score and as a result had more room to improve. Because of this factor, an additional analysis was performed to assess the impact of similar baseline scores on the results. A one-way analysis of co-variance was performed on the change scores for each stratum, separately. The covariate was the baseline score, and the independent variable was the intervention group. The comparison of intervention groups in this analysis has a different interpretation compared with that of the previous analyses. The estimated difference between the intervention groups is obtained assuming the intervention groups had the same average baseline score. The results from these separate analyses are presented in Table IV.4,

and are also in agreement with the results from the primary analyses. Once again, the primary analyses indicated that those subjects exposed to the educational intervention program had significantly greater improvements in Body Cathexis Scale scores than those subjects who were not exposed to the intervention.

Discrete Response Variable: Improvement Scores Based on the Body Cathexis Scale

Cochran-Mantel-Haenszel Chi-square analysis was carried out on Body Cathexis Scale Scores categorized as improvement or no improvement. A score of improvement was assigned to any subject with an increase in Body Cathexis Scale score from before intervention to after intervention. For each stratum, the intervention groups were compared with respect to the percent of subjects with improvement in the Body Cathexis Scale. The results from the analysis of percent of subjects with improvement based on those subjects who completed the study are summarized in Table IV.5, part a. Graph IV.5 presents the percent of subjects in the at risk stratum whose scores improved following the educational intervention (82.4 percent, 28 of 34 subjects). The changes in this group's scores were statistically significantly greater than the percent of subjects in the at risk stratum in the no intervention group (41.4 percent, 12 of 39 subjects). A similar result

Table IV.5
Summary of Cochran-Mantel-Haenszel Chi-Square Analysis of the Number of Subjects
With Improvement in Body Cathexis Score

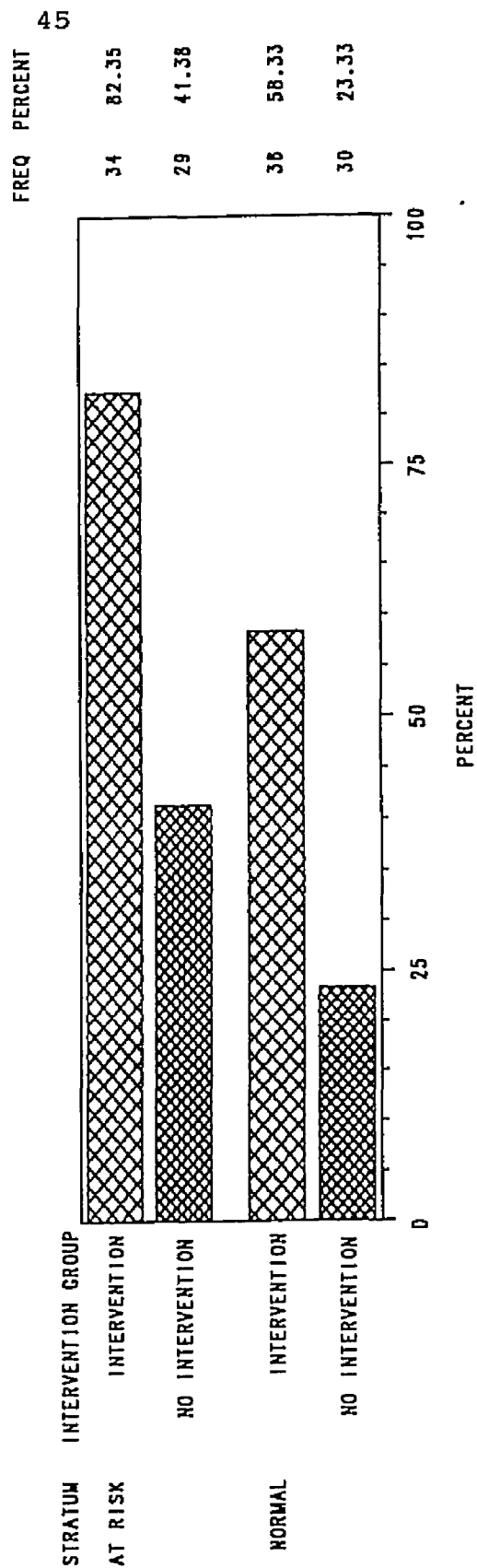
<u>Analysis Group</u>	<u>Subject Stratum</u>	<u>Intervention Group</u>	<u>N</u>	<u>Subjects with Improvement</u>		<u>P-value</u>	
				<u>Number</u>	<u>Percent</u>		
Completers (a)	At Risk	Intervention	34	28	82.4	0.001	
		No Intervention	29	12	41.4		
	Normal	Intervention	36	21	58.3		0.004
		No Intervention	30	7	23.3		
All Subjects (b)	At Risk	Intervention	38	28	73.7	< 0.0005	
		No Intervention	39	12	30.8		
	Normal	Intervention	38	21	55.3		0.002
		No Intervention	35	7	20.0		
All Subjects (c)	At Risk	Intervention	38	28	73.7	0.115	
		No Intervention	39	22	56.4		
	Normal	Intervention	38	21	55.3		0.074
		No Intervention	35	12	34.3		

(a) Primary categorical analysis was performed on completers.

(b) Intent-to-treat analysis was performed on all subjects to assess impact of dropouts on the primary analysis: all dropouts were assigned a change score of 0.

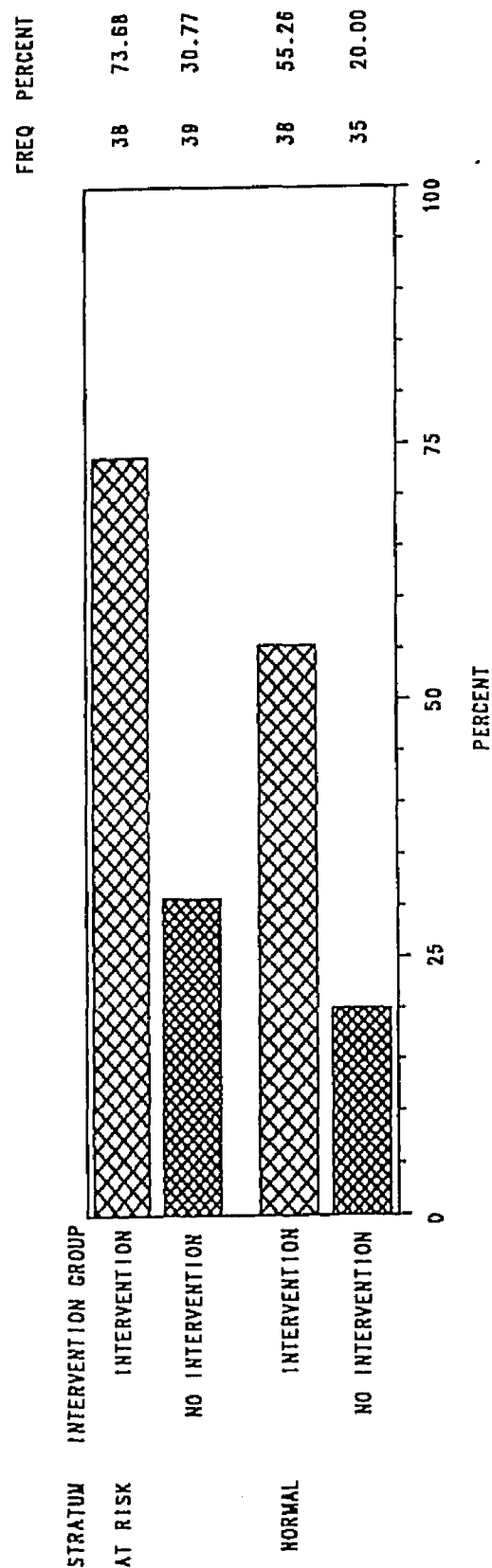
(c) Intent-to-treat analysis was performed on all subjects to assess impact of dropouts on the primary analysis: dropouts in the Intervention groups were assigned a change score of 0; dropouts in the No Intervention groups were assigned a change score of 0.04.

GRAPH IV.5
 PERCENT OF SUBJECTS WITH IMPROVEMENT IN BODY CATHEXIS SCORE
 SUBJECT GROUP: SUBJECTS WHO COMPLETED THE STUDY



GRAPH IV.6
 INTENT TO TREAT ANALYSIS OF PERCENT OF SUBJECTS WITH AN IMPROVEMENT IN BODY CATHESIS SCORE
 SUBJECT GROUP: ALL SUBJECTS

SCORING FOR DROPOUTS: NO IMPROVEMENT

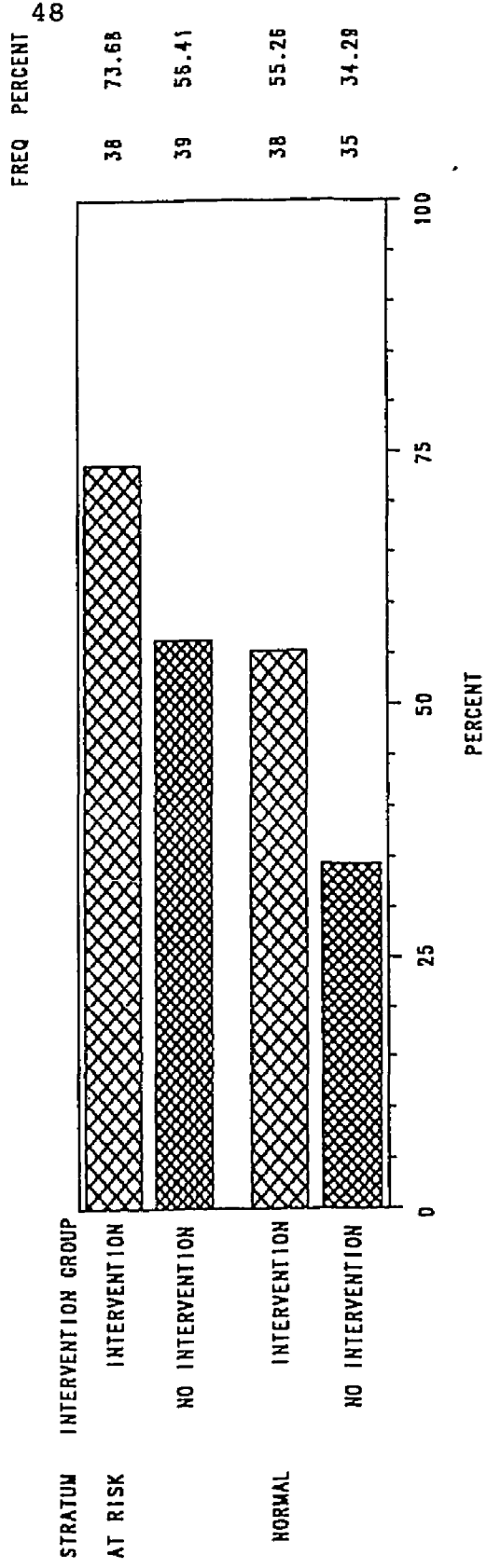


was found for the normal stratum. The percent of subjects with improvement in the intervention was 58.3 percent (21 of 36 subjects) compared with 23.3 percent (7 of 30 subjects) in the no intervention group. The probability of obtaining a difference of this size by chance was estimated to be 0.004. In a similar manner as described for the analysis of change scores, intent-to-treat (treatment for dropouts) analyses were also performed for the improvement scores. The first analysis, Table IV.5, part b, and Graph IV.6 assigned a score of "no improvement" to each dropout. The second analysis, Table IV.5, part c, and Graph IV.7 assigned a score of "no improvement" to each dropout in the intervention groups and a score of "improvement" to each dropout in the no intervention groups. In both intent-to-treat analyses for dropouts, the percent of subjects with improvement was greater for the intervention group compared with the percent in the no intervention group.

Based upon these analyses, it can be concluded that the educational intervention program had a significant positive effect upon the score on the Body Cathexis Scale for those subjects exposed to the program. Even if those subjects who had dropped out of the study had remained and had received the scores reported for the worst case situation, the subjects who participated in the intervention would have scored significantly higher on the

GRAPH IV.7
 INTENT TO TREAT ANALYSIS OF PERCENT OF SUBJECTS WITH AN IMPROVEMENT IN BDDY CATHEXIS SCORE
 SUBJECT GROUP: ALL SUBJECTS

SCORING FOR DROPOUTS: INTERVENTION - NO IMPROVEMENT NO INTERVENTION - IMPROVEMENT
 (WORST CASE SITUATION)



Body Cathexis Scale than those who had not participated in the intervention. These analyses present an extremely potent case for the educational intervention in terms of its positive impact upon the attitudes of the women to whom it was presented.

Analysis of Qualitative Data

Fifteen randomly chosen subjects were asked to answer some questions in a one-on-one interview with the investigator following the completion of the post-test. Briefly, the purposes of the interviews were to gather information to support the quantitative data and to elicit feedback about the contents of the intervention program itself. Thirteen agreed to participate. The interview questions, presented as Appendix G, were asked of randomly chosen subjects who had participated in the intervention. The subject numbers were selected in a randomization process prior to the final meeting of the subjects.

The answers to the interview questions appear to support the quantitative data in that there is intense preoccupation with weight and physical appearance among the women who were interviewed. For example, eleven of thirteen subjects stated that they were trying to lose weight, and nine of thirteen said that they wanted any weight loss that they experienced to be located in the hips, thighs and abdominal region. The majority of subjects reported strong feelings about their bodies, half

were generally positive and half were generally negative. Almost all of the women reported a desire to alter their physical appearance and more than half of those interviewed expressed a desire to tone and firm the lower halves of their bodies (hips, thighs, and abdominal areas).

Three-quarters of the women interviewed said that the information provided in the intervention made them feel better about themselves. This can be attributed to the fact that many were unaware that most of their beliefs were generally correct and, as a result, the information provided had the effect of reassuring them and reinforcing these beliefs. Almost all said that the information provided would be helpful to them with regard to their dieting, eating, and exercise behaviors. One young woman told the investigator, "It's quite a relief to know that I don't have to starve myself anymore."

When asked if some other type of information might have been helpful, the two that answered yes requested very specific guidelines with regard to what they should be eating. They wanted explicit diets that would tell them exactly what and when to eat. One subject stated that, "It would be so much easier if someone would just tell me what to eat and when to eat it. It would be one less thing I would have to worry about." This type of request re-emphasizes the intense preoccupation with food

and eating and lack of self-control over eating behaviors observed in young women. The aspects of the program that the women found to be most helpful were the information about the hidden fat content of most foods and the concept of body fat versus body weight. Also, how the body metabolizes different types of calories was of particular interest, as was the information about the importance of the most beneficial types and quantities of physical activity.

Overall, the general response regarding the intervention during the interviews was positive. The intervention program encouraged the participants to seek further information and education about appropriate eating and exercise behaviors. In doing this, they may be able to avoid some of the problematic responses to incorrect information that can lead to disordered eating.

Conclusions and Discussion

In analyzing the results from the primary and supplemental analyses, it is clear that the educational intervention program that was presented to the subgroups had a dramatic effect upon the exposed subjects' scores on the Body Cathexis Scale. For the at risk stratum, slightly less than half as many subjects improved on the Scale in the no intervention group (41.38 percent) than in the intervention group (82.35 percent). For the normal stratum, the rate of improvement in the intervention group

(58.33 percent) was more than twice that of the unexposed group (23.33 percent). As a result, the primary alternate hypothesis comparing the total number of intervention and no intervention subjects and the subsidiary hypotheses describing the normal and at risk subgroups have been accepted and the null hypotheses have been rejected. It can be concluded, then, that the educational intervention program presented in this study had a pronounced effect upon the attitudes associated with bulimia in those women exposed to the program.

In addressing the general research questions found in chapter three, education has apparently influenced the findings of this investigation by enhancing positive feelings about the physical self as demonstrated by the results of the Body Cathexis Scale analysis and by the responses to the interview questions. Both types of data indicate that positive feelings about the physical self were enhanced as subjects realized that the information they received would assist them in solving the dilemmas they face with regard to their eating and exercise habits and weight control.

One study cannot conclusively identify all of the distinctive attributes of an educational approach that can alter attitudes associated with bulimia. But certainly those presented in the intervention program for this study can be a starting point for identifying the contents of an

educational approach that would be effective in bringing about a resolution to the problem of disordered eating.

During this investigation, it was observed that the attrition rate among those subjects who participated in the intervention was much lower than the rate for those who did not participate. Perhaps the weekly interaction between subject and investigator and the relationships that developed were factors in producing this lower attrition rate.

According to the statistical analyses, education can be a factor in reducing attitudes associated with bulimic behavior in college-aged women. Also, positive changes in self-esteem and feelings about the physical self can occur following exposure to an educational program about basic nutrition, body composition, and management of eating and exercise behaviors.

Summary

A two-factor analysis of variance was performed on the Body Cathexis Scale scores. The factors compared were type of subject (normal, at risk) and type of treatment (intervention, non-intervention). For both analyses, the intervention group exhibited a significantly greater increase in cathexis scale scores compared with the no intervention groups, which can be assumed to be a positive result.

Two supplemental analyses were performed; the purpose was to assess the impact of the subjects who dropped out of the study. One analysis assigned a change score of 0 (no change) to all dropouts and the other assigned a score of 0 (no change) to each dropout in an intervention group and a score of 0.04 to each dropout in a non-intervention group. The purpose of this format was to create a "worst case" scenario. Results from these intent-to-treat analyses were in agreement with the primary analysis.

An additional one-way analysis of variance was performed to assess the impact of baseline scores on the results. The co-variate was the baseline score and the independent variable was the intervention group. Although the interpretation here is different because of the assumption that the intervention groups had the same baseline score, the results were also in agreement with the primary analysis.

Analysis of two-by-two tables was carried out with respect to the percent of subjects with improvement on the Body Cathexis Scale. This analysis and an intent-to-treat analysis were both supportive of the primary analysis. An overview of all analyses for both completers and all subjects with P-values is presented in Table IV.6 and Graphs IV.8, IV.9, and IV.10 at the end of this chapter.

Thirteen subjects from the intervention group were randomly selected and asked to answer a series of

Table IV.6
Summary of Cochran-Mantel-Haenszel Chi-Square Analysis of the Number of Subjects
With Improvement in Body Cathexis Score

Results Summarized By Stratum and Across Strata

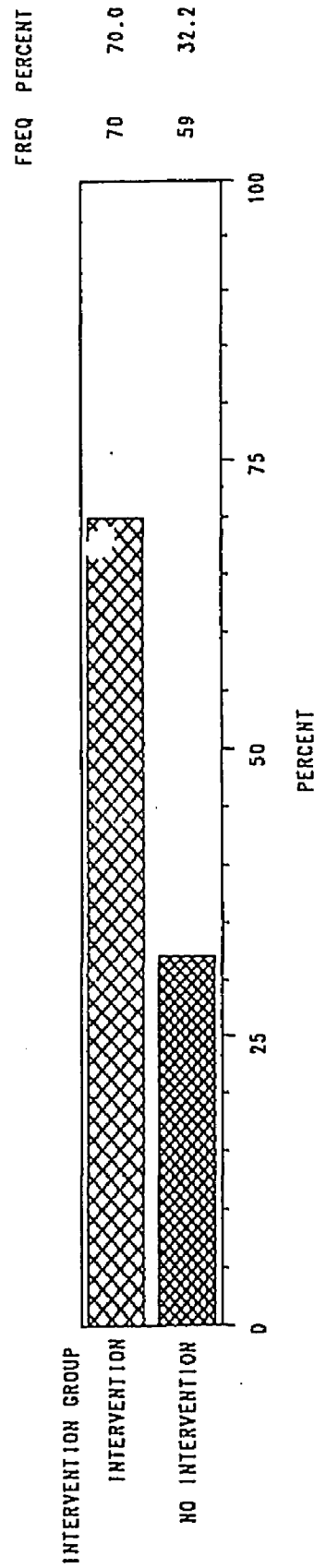
Analysis Group	Subject Stratum	Intervention Group	N	Subjects with Improvement		P-value	
				Number	Percent		
Completers (a)	At Risk	Intervention	34	28	82.4	0.001	
		No Intervention	29	12	41.4		
	Normal	Intervention	36	21	58.3		0.004
		No Intervention	30	7	23.3		
	Combined	Intervention	70	49	70.0		< 0.0005
		No Intervention	59	19	32.2		
All Subjects (b)	At Risk	Intervention	38	28	73.7	< 0.0005	
		No Intervention	39	12	30.8		
	Normal	Intervention	38	21	55.3		0.002
		No Intervention	35	7	20.0		
	Combined	Intervention	76	49	64.5		< 0.0005
		No Intervention	74	19	25.7		
All Subjects (c)	At Risk	Intervention	38	28	73.7	0.115	
		No Intervention	39	22	56.4		
	Normal	Intervention	38	21	55.3		0.074
		No Intervention	35	12	34.3		
	Combined	Intervention	76	49	64.5		0.017
		No Intervention	74	34	45.9		

(a) Primary categorical analysis was performed on completers.

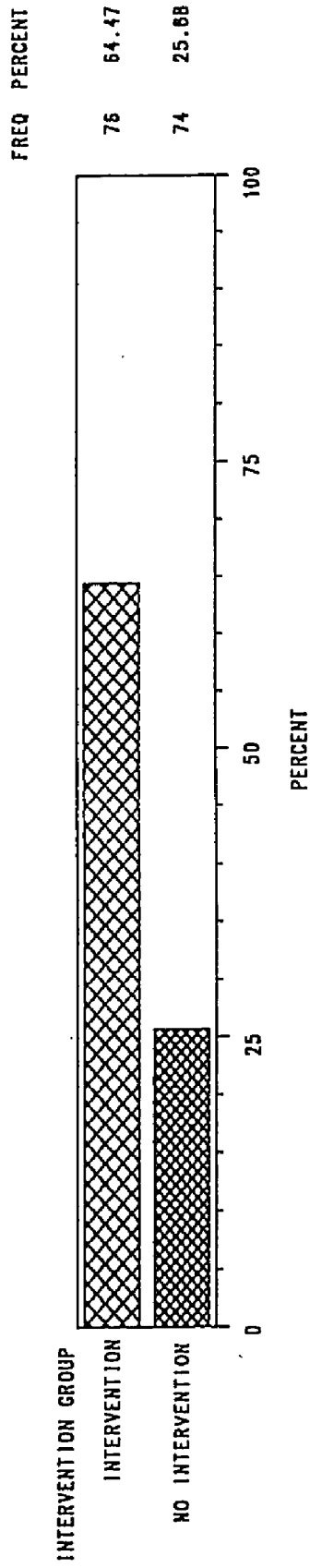
(b) Intent-to-treat analysis was performed on all subjects to assess impact of dropouts on the primary analysis: all dropouts were assigned a score of no improvement.

(c) Intent-to-treat analysis was performed on all subjects to assess impact of dropouts on the primary analysis: dropouts in the Intervention groups were assigned a score of no improvement; dropouts in the No Intervention groups were assigned a score of improvement.

GRAPH IV.8
PERCENT OF SUBJECTS WITH IMPROVEMENT IN BODY CATHESIS SCORE
SUBJECT GROUP: SUBJECTS WHO COMPLETED THE STUDY

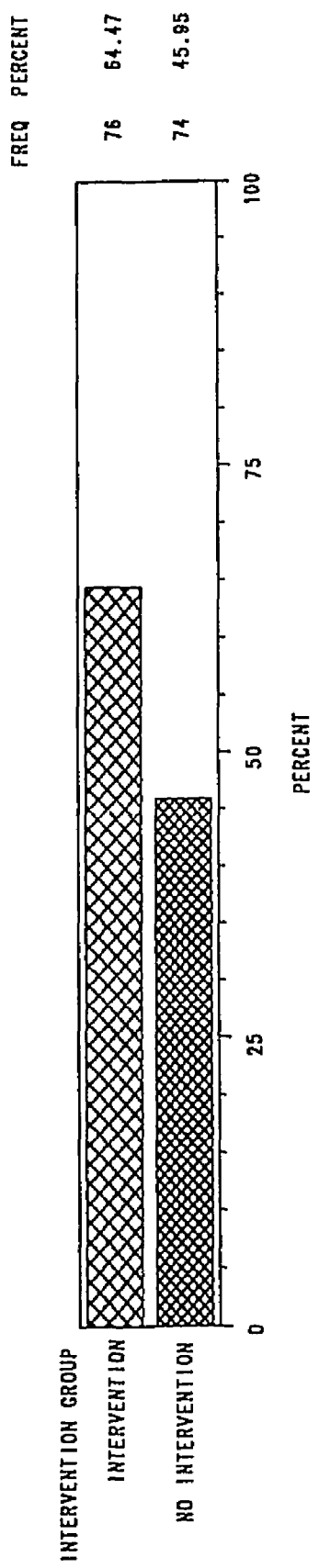


GRAPH IV.9
INTENT TO TREAT ANALYSIS OF PERCENT OF SUBJECTS WITH AN IMPROVEMENT IN BODY CATHESIS SCORE
SUBJECT GROUP: ALL SUBJECTS
SCORING FOR DROPOUTS: NO IMPROVEMENT



GRAPH IV.10
 INTENT TO TREAT ANALYSIS OF PERCENT OF SUBJECTS WITH AN IMPROVEMENT IN BODY CATHESIS SCORE
 SUBJECT GROUP: ALL SUBJECTS

SCORING FOR DROPOUTS: INTERVENTION - NO IMPROVEMENT NO INTERVENTION - IMPROVEMENT
 (WORST CASE SITUATION)



interview questions. The responses obtained appear to support the quantitative data in that there is intense preoccupation with body weight and physical appearance among the women interviewed. The responses also indicated that the intervention was of significant value in helping the subjects to become educated about appropriate eating and exercise behaviors.

Chapter 5: Summary and Conclusions

Summary

Bulimia is a serious, life-threatening eating disorder that is occurring with epidemic proportion among college-aged women (Boskind-White and White, 1983). Apparently its prevalence is also increasing among men and within other age groups. Given the relatively recent attention to bulimia and other eating disorders, many areas of uncertainty still exist regarding etiology, development of the pathological behaviors, and treatment. One basic principle seems to be apparent: victims may vary widely in selected psychological and physiological parameters and may respond to different methods of prevention or treatment for disordered eating.

Certainly education must be included in the comprehensive treatment of eating disorders. In particular, education about appropriate eating and exercise behaviors needs to be included in a society where physical appearance has become too important. The effects of nutrition education, as well as education about the devastating effects of bulimic behavior upon health may be important factors in reducing the incidence of the disorder.

First year women at the University of Richmond were invited to participate in a brief yet comprehensive

instructional program. This program was designed to provide education about eating and exercise behaviors and to enhance self-esteem and foster positive feelings about the physical self. The Body Cathexis Scale, an instrument designed to measure feelings about the physical self and how these feelings relate to self-esteem was used to measure the effectiveness of this program. Responses from individual interviews were also used to study effectiveness from a qualitative standpoint. Subjects were tested and randomly divided into two groups: normal and at risk for developing disordered eating based upon their scores on the Body Cathexis Scale. These groups were divided into four sub-groups (two normal and two at risk) using a computerized randomization schedule. One normal group and one at risk group were exposed to the intervention program.

Conclusions

A two-factor analysis of variance (type of subject: at risk and normal, and type of treatment: intervention and no intervention) was used to analyze the results of the study. For both analyses, the intervention groups exhibited a significantly greater increase in cathexis scale scores than the no intervention groups.

The results from the primary analysis indicated that those subjects who had participated in the educational intervention program not only had significantly greater

improvements in cathexis scale scores, but tended to remain in the program for the duration in greater numbers than those who were not exposed to the program. These two findings help to support the conclusions that the educational intervention program was significant in reducing the attitudes associated with bulimic behavior and in keeping the subjects involved in a program where the purpose was the dissemination of information about healthful eating and exercise behaviors.

Several additional quantitative analyses were performed on the data collected. These included an intent to treat analysis and an assessment of the impact of baseline scores on the results. The purpose of the first supplemental analysis was to assess the effects, if any, of the subjects who had dropped out of the study upon the final statistical comparisons. It was determined that the subjects who dropped out had no significant effects upon the results of this investigation. Also, since the subgroups were formulated based upon the scores from the Body Cathexis Scale, the at risk groups began the study with lower scores and, as a result, with more room to improve. The second supporting analysis compared the subgroups with hypothetically identical baseline scores. Once again, the findings were insignificant. Therefore, these supplemental analyses were in agreement with the primary analysis.

Personal interviews were conducted following completion of the post-test. Information obtained from these interviews conducted with randomly chosen intervention subjects appeared to support the quantitative data. The responses revealed intense preoccupation with appearance and body weight and a strong desire to alter physical appearance in some way related to weight and body size. The answers to the questions also indicated the belief by the subjects who were interviewed that the intervention program was helpful and would be a good starting point for positive health behavior change.

Discussion

Because of the explosive occurrence of eating disorders in the last decade, research regarding aspects of the dynamics of preventive theory and techniques is rare, if it is available at all. A great deal of effort has been expended in an attempt to treat the problems that have arisen as a result of such an overwhelming emphasis upon physical appearance and of such a great deal of misinformation about dieting and weight control.

It is likely that the professionals who have had to work with individuals suffering from these problems have had to spend so much time treating the existing cases that there has been little investigation into the role that education can play in the prevention of disordered eating. Because of the large numbers of college-aged women

reported to be suffering from bulimia, it is apparent that this particular group can be considered to be at high risk given their age, sex, and stage of development. Certainly much of the societal pressure to conform to a thin ideal has been internalized by this time in a person's life, but symptoms of the full-blown disorder known as bulimia appear to surface most often when the individual is in an environment conducive to practicing these behaviors, like a college dormitory.

Education about healthful eating and exercise habits and how to take care of the body needs to be made available to these young people so that when choices are made, they will be armed with the correct information as well as with whatever is passed around among their peers. Information about what happens to the body as a result of binge-purge behavior needs to be made available. Also, education about the long term difficulties of maintaining normal body composition following months or even years of starvation dieting and of depriving the body of necessary nourishment must be provided. Without this basic information, many young people will not be able to make the correct choices and practice the behaviors that will help them avoid the addictive trap that bulimic behavior can set.

Implications for Policy, Practice, and Future Research

Bulimia can be life-threatening; indeed, death rates from the behaviors associated with the disorder have been estimated to be as high as twelve to fifteen percent of those who succumb to the disorder. (Boskind-White and White, 1983). Certainly any methods that may be able to assist in prevention of these destructive behaviors invite further study. Education can open new doors; it can certainly offer alternatives to behavior that is anything but positive and corrective of a real or perceived problem with the physical self.

The results of this particular study were dramatic and call for further inquiry into the hypothesis that education can be a factor in altering attitudes about the physical self and can therefore be helpful in efforts to prevent some of the behaviors associated with bulimia. Institutions of higher education can introduce materials similar to those presented in the intervention program early in the college experience to help educate individuals about appropriate and healthful behaviors. It is important to recognize that the myriad of misinformation available about nutrition and weight control coupled with the intense preoccupation with physical appearance and external approval can lead to pathological eating and exercise behaviors geared toward altering the physique and how one may be perceived by

others. Education to provide correct information about health-related issues and to assist individuals in developing strong, positive self-concepts can be included in freshman seminars and health principles courses offered early in the collegiate experience. Based upon the findings of this investigation, education of this type, appropriately timed and placed into the collegiate curriculum, can be of great significance in helping to prevent some of these types of problems facing young people today.

Topics for future study might include the use of the intervention program presented in comparison to an educational program unrelated to health issues and practices to help determine the significance of the actual contents of the study. Employing the intervention program presented in comparison to another health-related program to try to pinpoint the exact nature of the most effective contents might be an appropriate avenue for further study. In other words, comparing the impact of the intervention program presented to the impact of an alternative health-related program to compare results may help to determine the effectiveness of the topics particular to this study. A similar study using young men might be useful, as would a study using both men and women within the same sub-groups. Studies with women from different age groups would be interesting and useful as

well since eating disorders appear to be increasing among women of all ages and among men.

Ideally, a longitudinal study involving the women who participated in this investigation might be quite useful in determining the effects of an intervention program strategically placed during the first year of school. Locating these women at the completion of the four year academic program and analyzing their attitudes and behaviors concerning eating and exercise both quantitatively and qualitatively during college may be quite valuable in determining the effectiveness of an intervention program of this type. In any event, it is time to move forward toward the creation of a prevention model that can help to arrest this devastating disorder that has affected the lives of so many.

Epilogue

In conclusion, it is clear that addressing the problem of bulimia from a preventive standpoint seems to have been quite productive. The use of education about eating and exercise behaviors has proved to be dramatically effective in altering some of the attitudes associated with the development of the eating disorder bulimia. If investigations of this type become commonplace in the literature, they should become valuable tools in the prevention efforts of institutions of higher

learning. In identifying the components of an effective educational program, colleges and universities can become better able to prevent the behaviors and attitudes that so handicap the young people who are affected. Ideally, education can become an integral part of an overall effort that moves toward a timely end to this dilemma.

APPENDICES

APPENDIX A

SUBJECT CONSENT FORM: INTERVENTION SUBJECTS

APPENDIX A

SUBJECT CONSENT FORM

INTERVENTION SUBJECTS

Jan Elliott Evans
10225 Glendye Road
Richmond, VA 23235
804-323-1087

Sponsoring Faculty Member: Professor Roger G. Baldwin, School of Education, College of William and Mary, Williamsburg, VA 23185

You are being asked to complete two short questionnaires that measure feelings about your body and its functions. You will be asked to complete one questionnaire today and one approximately five weeks from today.

You are also being asked to attend four sixty minute sessions and where information about nutrition, body composition, and eating and exercise behaviors will be presented. You may be asked to answer some questions in a brief interview about the information following the sessions. Further participatory activities or other type of involvement will not be required. All responses on the questionnaires will be maintained in the strictest confidence and all data will be group analyzed so no individual responses will be identifiable. You have the right to refuse to be interviewed.

I agree to participate in the research project that is described herein. I understand that all written responses will be obtained anonymously. I also understand that I may refuse to respond to particular questions and that I may terminate participation at any time without prejudice to me.
I am eighteen years of age or older.

(signed)

(date)

local address and phone no.

APPENDIX B

SUBJECT CONSENT FORM: NO INTERVENTION SUBJECTS

APPENDIX B

SUBJECT CONSENT FORM

NO INTERVENTION SUBJECTS

Jan Elliott Evans
10225 Glendye Road
Richmond, VA 23235
804-323-1087

Sponsoring Faculty Member: Professor Roger G. Baldwin,
School of Education, College of William and Mary,
Williamsburg, VA 23185

You are being asked to complete two short questionnaires that measure feelings about your body and its functions. You will be asked to complete one questionnaire today and one approximately five weeks from today. Further participatory activities or other type of involvement will not be required. All responses on the questionnaires will be maintained in the strictest confidence and all data will be group analyzed so no individual responses will be identifiable. You have the right to refuse to be interviewed.

I agree to participate in the research project that is described herein. I understand that all written responses will be obtained anonymously. I also understand that I may refuse to respond to particular questions and that I may terminate participation at any time without prejudice to me.

I am eighteen years of age or older.

(signed)

(date)

local address and phone no.

APPENDIX C
BODY CATHEXIS SCALE

APPENDIX C

BODY CATHEXIS SCALE

Instructions and Items

On the following pages are listed a number of things characteristic of yourself or related to you. You are asked to indicate which things you are satisfied with exactly as they are, which things you worry about and would like to change if it were possible, and which things you have no feeling about one way or the other.

Consider each item listed below and place the number which best represents your feelings next to the corresponding item according to the following scale.

1. Have strong feelings and wish change could somehow be made
2. Don't like, but can put up with
3. Have no particular feelings one way or the other
4. Am satisfied
5. Consider myself fortunate

hair	width of shoulders
facial complexion	arms
appetite	chest
hands	eyes
distribution of hair over body	digestion
nose	hips
fingers	skin texture
elimination	lips
wrists	legs
waist	teeth
energy level	forehead
back	feet
ears	sleep
chin	voice
exercise	health
ankles	sex activities
neck	knees
shape of head	posture
body build	face
profile	weight
height	sex (male or female)
age	back view of head
	trunk

first name
others morals
ability to express self
taste in clothes
sense of duty
sophistication
self-understanding
life-goals
artistic talents
tolerance
moods
general knowledge
popularity
imagination
self-confidence

sensitivity to opinions of
ability to lead
last name
impulses
manners
handwriting
intelligence level
athletic skills
happiness
creativity
love life
strength of conviction
conscience
skill with hands

APPENDIX D

RANDOMIZATION SCHEDULE: NORMAL SUBJECTS

RANDOMIZATION SCHEDULE
 INVESTIGATOR: JAN EVANS
 RANDOMIZATION BLOCKED IN GROUPS OF 10
 SEED = 88921
 PREPARED BY C W KISH ON 09/20/88

----- TYPE OF SUBJECT=NORMAL -----

TEST NUMBER	SUBJECT	RANDOMLY ASSIGNED TREATMENT GROUP
_____	1151	INTERVENTION
_____	1152	NO INTERVENTION
_____	1153	INTERVENTION
_____	1154	NO INTERVENTION
_____	1155	INTERVENTION
_____	1156	INTERVENTION
_____	1157	NO INTERVENTION
_____	1158	NO INTERVENTION
_____	1159	INTERVENTION
_____	1160	NO INTERVENTION
_____	1161	NO INTERVENTION
_____	1162	NO INTERVENTION
_____	1163	NO INTERVENTION
_____	1164	INTERVENTION
_____	1165	NO INTERVENTION
_____	1166	NO INTERVENTION
_____	1167	INTERVENTION
_____	1168	INTERVENTION
_____	1169	INTERVENTION
_____	1170	INTERVENTION
_____	1171	NO INTERVENTION
_____	1172	NO INTERVENTION
_____	1173	INTERVENTION
_____	1174	INTERVENTION
_____	1175	INTERVENTION
_____	1176	INTERVENTION
_____	1177	NO INTERVENTION
_____	1178	NO INTERVENTION
_____	1179	INTERVENTION
_____	1180	NO INTERVENTION
_____	1181	NO INTERVENTION
_____	1182	INTERVENTION
_____	1183	NO INTERVENTION
_____	1184	INTERVENTION
_____	1185	NO INTERVENTION
_____	1186	NO INTERVENTION
_____	1187	INTERVENTION
_____	1188	INTERVENTION
_____	1189	NO INTERVENTION
_____	1190	INTERVENTION
_____	1191	NO INTERVENTION
_____	1192	INTERVENTION
_____	1193	NO INTERVENTION
_____	1194	INTERVENTION
_____	1195	NO INTERVENTION
_____	1196	NO INTERVENTION
_____	1197	INTERVENTION
_____	1198	INTERVENTION
_____	1199	NO INTERVENTION

RANDOMIZATION SCHEDULE
 INVESTIGATOR: JAN EVANS
 RANDOMIZATION BLOCKED IN GROUPS OF 10
 SEED = 88921
 PREPARED BY C W KISH CN 09/20/88

----- TYPE OF SUBJECT=NORMAL -----

TEST NUMBER	SUBJECT	RANDOMLY ASSIGNED TREATMENT GROUP
_____	1200	INTERVENTION
_____	1201	INTERVENTION
_____	1202	NO INTERVENTION
_____	1203	INTERVENTION
_____	1204	NO INTERVENTION
_____	1205	INTERVENTION
_____	1206	INTERVENTION
_____	1207	INTERVENTION
_____	1208	NO INTERVENTION
_____	1209	NO INTERVENTION
_____	1210	NO INTERVENTION
_____	1211	INTERVENTION
_____	1212	NO INTERVENTION
_____	1213	INTERVENTION
_____	1214	INTERVENTION
_____	1215	NO INTERVENTION
_____	1216	NO INTERVENTION
_____	1217	NO INTERVENTION
_____	1218	INTERVENTION
_____	1219	INTERVENTION
_____	1220	NO INTERVENTION
_____	1221	NO INTERVENTION
_____	1222	INTERVENTION
_____	1223	INTERVENTION
_____	1224	NO INTERVENTION
_____	1225	INTERVENTION
_____	1226	INTERVENTION
_____	1227	NO INTERVENTION
_____	1228	NO INTERVENTION
_____	1229	NO INTERVENTION
_____	1230	INTERVENTION
_____	1231	INTERVENTION
_____	1232	NO INTERVENTION
_____	1233	INTERVENTION
_____	1234	NO INTERVENTION
_____	1235	INTERVENTION
_____	1236	INTERVENTION
_____	1237	NO INTERVENTION
_____	1238	NO INTERVENTION
_____	1239	NO INTERVENTION
_____	1240	INTERVENTION
_____	1241	NO INTERVENTION
_____	1242	INTERVENTION
_____	1243	NO INTERVENTION
_____	1244	INTERVENTION
_____	1245	NO INTERVENTION
_____	1246	NO INTERVENTION
_____	1247	INTERVENTION
_____	1248	INTERVENTION

RANDOMIZATION SCHEDULE
 INVESTIGATOR: JAN EVANS
 RANDOMIZATION BLOCKED IN GROUPS OF 10
 SEED = 88921
 PREPARED BY C W KISH ON 09/20/88

----- TYPE OF SUBJECT=NORMAL -----

TEST NUMBER	SUBJECT	RANDOMLY ASSIGNED TREATMENT GROUP
_____	1249	INTERVENTION
_____	1250	NO INTERVENTION
_____	1251	INTERVENTION
_____	1252	INTERVENTION
_____	1253	NO INTERVENTION
_____	1254	NO INTERVENTION
_____	1255	NO INTERVENTION
_____	1256	INTERVENTION
_____	1257	NO INTERVENTION
_____	1258	INTERVENTION
_____	1259	INTERVENTION
_____	1260	NO INTERVENTION
_____	1261	NO INTERVENTION
_____	1262	INTERVENTION
_____	1263	NO INTERVENTION
_____	1264	INTERVENTION
_____	1265	INTERVENTION
_____	1266	NO INTERVENTION
_____	1267	INTERVENTION
_____	1268	NO INTERVENTION
_____	1269	INTERVENTION
_____	1270	NO INTERVENTION
_____	1271	INTERVENTION
_____	1272	NO INTERVENTION
_____	1273	NO INTERVENTION
_____	1274	INTERVENTION
_____	1275	INTERVENTION
_____	1276	NO INTERVENTION
_____	1277	INTERVENTION
_____	1278	NO INTERVENTION
_____	1279	NO INTERVENTION
_____	1280	INTERVENTION
_____	1281	INTERVENTION
_____	1282	NO INTERVENTION
_____	1283	NO INTERVENTION
_____	1284	INTERVENTION
_____	1285	NO INTERVENTION
_____	1286	INTERVENTION
_____	1287	INTERVENTION
_____	1288	NO INTERVENTION
_____	1289	INTERVENTION
_____	1290	NO INTERVENTION
_____	1291	NO INTERVENTION
_____	1292	NO INTERVENTION
_____	1293	INTERVENTION
_____	1294	INTERVENTION
_____	1295	INTERVENTION
_____	1296	NO INTERVENTION
_____	1297	INTERVENTION

RANDOMIZATION SCHEDULE
INVESTIGATOR: JAN EVANS
RANDOMIZATION BLOCKED IN GROUPS OF 10
SEED = 88921
PREPARED BY C W KISH ON 09/20/88

----- TYPE OF SUBJECT=NORMAL -----

TEST NUMBER	SUBJECT	RANDOMLY ASSIGNED TREATMENT GROUP
_____	1298	INTERVENTION
_____	1299	NO INTERVENTION
_____	1300	NO INTERVENTION

APPENDIX E
RANDOMIZATION SCHEDULE: AT RISK SUBJECTS

RANDOMIZATION SCHEDULE
 INVESTIGATOR: JAN EVANS
 RANDOMIZATION BLOCKED IN GROUPS OF 10
 SEED = 88921
 PREPARED BY C W KISH ON 09/20/88

----- TYPE OF SUBJECT=AT RISK -----

TEST NUMBER	SUBJECT	RANDOMLY ASSIGNED TREATMENT GROUP
_____	1001	NO INTERVENTION
_____	1002	NO INTERVENTION
_____	1003	NO INTERVENTION
_____	1004	NO INTERVENTION
_____	1005	INTERVENTION
_____	1006	INTERVENTION
_____	1007	INTERVENTION
_____	1008	INTERVENTION
_____	1009	INTERVENTION
_____	1010	NO INTERVENTION
_____	1011	INTERVENTION
_____	1012	INTERVENTION
_____	1013	INTERVENTION
_____	1014	NO INTERVENTION
_____	1015	INTERVENTION
_____	1016	NO INTERVENTION
_____	1017	NO INTERVENTION
_____	1018	INTERVENTION
_____	1019	NO INTERVENTION
_____	1020	NO INTERVENTION
_____	1021	INTERVENTION
_____	1022	NO INTERVENTION
_____	1023	INTERVENTION
_____	1024	INTERVENTION
_____	1025	NO INTERVENTION
_____	1026	INTERVENTION
_____	1027	INTERVENTION
_____	1028	NO INTERVENTION
_____	1029	NO INTERVENTION
_____	1030	NO INTERVENTION
_____	1031	NO INTERVENTION
_____	1032	NO INTERVENTION
_____	1033	INTERVENTION
_____	1034	INTERVENTION
_____	1035	NO INTERVENTION
_____	1036	INTERVENTION
_____	1037	NO INTERVENTION
_____	1038	INTERVENTION
_____	1039	INTERVENTION
_____	1040	NO INTERVENTION
_____	1041	INTERVENTION
_____	1042	NO INTERVENTION
_____	1043	INTERVENTION
_____	1044	INTERVENTION
_____	1045	INTERVENTION
_____	1046	NO INTERVENTION
_____	1047	NO INTERVENTION
_____	1048	INTERVENTION
_____	1049	NO INTERVENTION

RANDOMIZATION SCHEDULE
 INVESTIGATOR: JAN EVANS
 RANDOMIZATION BLOCKED IN GROUPS OF 10
 SEED = 88921
 PREPARED BY C W KISH ON 09/20/88

----- TYPE OF SUBJECT=AT RISK -----

TEST NUMBER	SUBJECT	RANDOMLY ASSIGNED TREATMENT GROUP
_____	1050	NO INTERVENTION
_____	1051	NO INTERVENTION
_____	1052	INTERVENTION
_____	1053	INTERVENTION
_____	1054	INTERVENTION
_____	1055	NO INTERVENTION
_____	1056	NO INTERVENTION
_____	1057	INTERVENTION
_____	1058	INTERVENTION
_____	1059	NO INTERVENTION
_____	1060	NO INTERVENTION
_____	1061	NO INTERVENTION
_____	1062	INTERVENTION
_____	1063	INTERVENTION
_____	1064	INTERVENTION
_____	1065	INTERVENTION
_____	1066	NO INTERVENTION
_____	1067	NO INTERVENTION
_____	1068	NO INTERVENTION
_____	1069	NO INTERVENTION
_____	1070	INTERVENTION
_____	1071	INTERVENTION
_____	1072	NO INTERVENTION
_____	1073	NO INTERVENTION
_____	1074	NO INTERVENTION
_____	1075	NO INTERVENTION
_____	1076	INTERVENTION
_____	1077	INTERVENTION
_____	1078	INTERVENTION
_____	1079	INTERVENTION
_____	1080	NO INTERVENTION
_____	1081	INTERVENTION
_____	1082	NO INTERVENTION
_____	1083	INTERVENTION
_____	1084	NO INTERVENTION
_____	1085	INTERVENTION
_____	1086	NO INTERVENTION
_____	1087	INTERVENTION
_____	1088	INTERVENTION
_____	1089	NO INTERVENTION
_____	1090	NO INTERVENTION
_____	1091	NO INTERVENTION
_____	1092	INTERVENTION
_____	1093	INTERVENTION
_____	1094	INTERVENTION
_____	1095	NO INTERVENTION
_____	1096	NO INTERVENTION
_____	1097	NO INTERVENTION
_____	1098	NO INTERVENTION

RANDOMIZATION SCHEDULE
 INVESTIGATOR: JAN EVANS
 RANDOMIZATION BLOCKED IN GROUPS OF 10
 SEED = 88921
 PREPARED BY C W KISH ON 09/20/88

----- TYPE OF SUBJECT=AT RISK -----

TEST NUMBER	SUBJECT	RANDOMLY ASSIGNED TREATMENT GROUP
_____	1099	INTERVENTION
_____	1100	INTERVENTION
_____	1101	NO INTERVENTION
_____	1102	INTERVENTION
_____	1103	INTERVENTION
_____	1104	NO INTERVENTION
_____	1105	INTERVENTION
_____	1106	INTERVENTION
_____	1107	NO INTERVENTION
_____	1108	INTERVENTION
_____	1109	NO INTERVENTION
_____	1110	NO INTERVENTION
_____	1111	INTERVENTION
_____	1112	INTERVENTION
_____	1113	INTERVENTION
_____	1114	NO INTERVENTION
_____	1115	NO INTERVENTION
_____	1116	NO INTERVENTION
_____	1117	NO INTERVENTION
_____	1118	INTERVENTION
_____	1119	NO INTERVENTION
_____	1120	INTERVENTION
_____	1121	NO INTERVENTION
_____	1122	INTERVENTION
_____	1123	NO INTERVENTION
_____	1124	NO INTERVENTION
_____	1125	INTERVENTION
_____	1126	INTERVENTION
_____	1127	INTERVENTION
_____	1128	NO INTERVENTION
_____	1129	INTERVENTION
_____	1130	NO INTERVENTION
_____	1131	NO INTERVENTION
_____	1132	INTERVENTION
_____	1133	NO INTERVENTION
_____	1134	NO INTERVENTION
_____	1135	NO INTERVENTION
_____	1136	INTERVENTION
_____	1137	INTERVENTION
_____	1138	INTERVENTION
_____	1139	INTERVENTION
_____	1140	NO INTERVENTION
_____	1141	INTERVENTION
_____	1142	INTERVENTION
_____	1143	INTERVENTION
_____	1144	INTERVENTION
_____	1145	NO INTERVENTION
_____	1146	NO INTERVENTION
_____	1147	NO INTERVENTION

RANDOMIZATION SCHEDULE
INVESTIGATOR: JAN EVANS
RANDOMIZATION BLOCKED IN GROUPS OF 10
SEED = 88921
PREPARED BY C W KISH ON 09/20/88

----- TYPE OF SUBJECT=AT RISK -----

TEST NUMBER	SUBJECT	RANDOMLY ASSIGNED TREATMENT GROUP
_____	1148	NO INTERVENTION
_____	1149	NO INTERVENTION
_____	1150	INTERVENTION

APPENDIX F
EDUCATIONAL INTERVENTION PROGRAM

APPENDIX F

EDUCATIONAL INTERVENTION PROGRAM

There are seven nutrients essential to life and health. Three are energy nutrients; they provide calories, and four are also essential but do not provide calories. The three that provide calories are carbohydrates, fats, and proteins. Sixty percent of the daily caloric intake should be from the carbohydrate group, the most efficient energy source and the cornerstone for weight management. Twenty-five percent of the daily intake should come from the fat group. Americans get about 45% of their calories from fat. A high fat diet is the cause of many of the nutrition-related problems, such as obesity and heart disease. And cholesterol is just one type of fat; it is important to watch the intake of all types of fats. Consumption of protein foods should consist of about 12-15% of the total daily intake. The body does not store protein in amino acid form, rather, it is broken down and used as energy or stored as fat. The biggest mistake that is made in the selection of food is that many of the foods that have long been thought to be high in protein are actually high in fat.

Of all of the nutrients, water is the most important. It makes use of all other nutrients possible. Daily intake of this non-energy nutrient should be 6-10 glasses, in addition to any other fluids that are consumed. In

addition to facilitating use of the other nutrients, water enhances thermoregulation and digestion, to name but two bodily functions to which it is directly related.

Vitamins are classified as either water-soluble or fat-soluble. The water-soluble vitamins are B-Complex and C. These are dissolved, absorbed, and utilized in the presence of water. Any excess is usually lost in the urine, so they must be replaced in the daily diet. The fat-soluble vitamins are A, D, E, and K. The human liver and fat cells are capable of storing enormous amounts of these vitamins, making daily replacement and supplementation unnecessary. Minerals are also essential non-energy nutrients. Foods rich in minerals such as calcium, iron, potassium, and magnesium should be consumed daily. Dietary fiber, also a non-energy nutrient, has been shown to be necessary for optimal intestinal health. Fiber, or cellulose, is that part of carbohydrate foods that cannot be broken down by the human digestive tract. Foods vary in the amount and type of fiber that they contain. Generally speaking, four servings of grain products and four servings of fruits and vegetables daily will yield sufficient amounts of the various types. The most important factor here is to avoid dependence upon one particular food or fiber supplement for adequate amounts of this important nutrient.

Weight loss programs have been with us for years, yet even those designed by the best trained professionals are

failures. The problem is that emphasis has always been upon weight loss and not fat loss. This difference may not appear to be significant, but in fact it is crucial to successful reducing programs. Fat is lost from the body almost exclusively by being burned in muscle. This explains the distressingly high failure of many of the programs that are currently available. An increase in fat tissue in the body is more related to a lack of physical activity than to age or to what is eaten.

The relationship between muscle mass and obesity has long been misunderstood. The amount and size of muscle tissue decreases simply because of a lack of activity. As muscle mass decreases, the body uses less energy and a greater percentage of the total body weight becomes fat. In other words, people become fatter as a result of a loss of muscle mass caused by inactivity. The body continues to use more calories if muscle mass is maintained. The muscle mass in a healthy person accounts for about ninety-eight percent of the fat metabolism. The fault in most weight loss schemes is that some of the rapidly lost weight is muscle, rendering the body increasingly unable to burn fat. The points to be remembered, then, are that the focus is upon fat loss and that muscle loss is to be avoided because it results in decreased ability to burn fat. Rapid weight loss, vomiting, laxative and diuretic abuse, and excessive exercise all compromise muscle tissue and can impair the body's ability to burn fat.

There are certain biological factors that are involved in the management of body fat. Women's bodies contain a higher percentage of adipose tissue than men's. In general, women have a lower resting metabolic rate than men's and as a result require fewer calories to sustain life. This difference is due, in part, to the size differences between the sexes, but it is mainly due to the lower ratio of lean to fat tissue in women. Lean tissue is more metabolically active than fat tissue and contributes in this way to men's higher resting metabolic rate. Specific differences in weight are also genetically determined. Heredity may influence the way in which food is metabolized and may also affect responses to restricted or uninhibited eating behavior.

Dieting is not only an ineffective method for attaining long term weight loss, it may in fact contribute to subsequent binge eating and weight gain because significant caloric restriction in and of itself contributes to increased adiposity. A substantial decrease in caloric intake will result in a decreased metabolic rate, and this will impede weight loss over an extended period of time. Upon resumption of normal caloric intake, metabolic rate may remain decreased for some time, causing a weight gain that would not have occurred prior to the attempted caloric restriction. It can take years for the metabolic rate to readjust, depending upon the number and severity of restrictive

episodes. As a result, each subsequent attempt at weight loss will be more frustrating because it will become increasingly difficult to lose the same amount of weight as the body fights any reduction in caloric intake and defends the level of adiposity that has been attained.

Basal metabolic rate rises considerably in response to eating and exercise. In combination, these two factors can bring about a significant increase in the basal metabolic rate. The body defends its set point of body fat rather well. The only known factor that will lower set point is exercise; dieting and a sedentary lifestyle will raise it.

In setting goals for exercise behavior, there is a minimum amount and a maximum amount that can be used as guidelines. Minimum: three times per for thirty minutes at 60% HR Max; maximum: six times per week for sixty minutes at 85% HR Max. Goals for adjusting eating behavior should include altering intake of energy nutrients according to percentages given, and eating several smaller meals throughout the day. This can help keep hunger levels lower and can alleviate the problem of giving the body too many calories at once, a significant factor in the storage of excess calories as fat. Moderate changes at first will encourage lifetime behavior change with a minimum of discomfort and disruption of normal routine.

APPENDIX G
INTERVIEW QUESTIONS

APPENDIX G

INTERVIEW QUESTIONS

1. Do you have strong feelings about your body?
2. Are they generally positive or negative?
3. What changes, if any, would you like to make?
4. Are you more concerned with bodily functions or actual physical appearance?
5. What effect, if any, has the information you have just had upon your feelings about your physical appearance?
6. What effect, if any, has the information you have just received had upon your feelings about your body and its functions?
7. Do you believe that the information you have received as a result of this experience will be helpful to you? In what ways?
8. Do you think that some other type of information concerning nutrition, body composition, and eating and exercise behaviors might have been more helpful? Could you elaborate upon what might have been included in this type of program?
9. What aspects of the program did you find to be particularly helpful?
10. Can you elaborate briefly upon the aspects of the program that you found to be most helpful?

APPENDIX H
LISTING OF DATA: ALL SUBJECTS

SAS
 LISTING OF DATA
 SUBJECT GROUP: ALL SUBJECTS

SUBJECT	TYPESUBJ	TRT	PRE	POST	CHANGE
1	NORMAL	YES	3.60	3.70	0.10
2	NORMAL	NO	3.90	4.10	0.20
3	AT RISK	NO	2.00	.	.
4	AT RISK	NO	2.20	2.20	0.00
5	NORMAL	YES	4.60	4.70	0.10
6	AT RISK	NO	3.50	3.50	0.00
7	NORMAL	NO	3.70	.	.
8	AT RISK	NO	3.10	3.00	-.10
9	AT RISK	YES	3.30	.	.
10	NORMAL	YES	4.20	4.20	0.00
11	NORMAL	YES	4.10	4.40	0.30
12	AT RISK	YES	2.80	3.00	0.20
13	NORMAL	NO	3.60	3.60	0.00
14	AT RISK	YES	2.10	2.40	0.30
15	NORMAL	NO	3.90	.	.
16	NORMAL	YES	3.80	3.80	0.00
17	NORMAL	NO	3.80	3.80	0.00
18	AT RISK	YES	3.50	3.60	0.10
19	NORMAL	NO	3.60	.	.
20	AT RISK	YES	2.70	2.70	0.00
21	NORMAL	NO	4.20	4.20	0.00
22	NORMAL	NO	4.40	4.30	-.10
23	AT RISK	NO	2.40	2.50	0.10
25	AT RISK	YES	2.40	2.70	0.30
26	NORMAL	YES	4.30	4.50	0.20
28	AT RISK	YES	2.00	2.40	0.40

SAS
 LISTING OF DATA
 SUBJECT GROUP: ALL SUBJECTS

SUBJECT	TYPESUBJ	TRT	PRE	POST	CHANGE
29	AT RISK	YES	3.20	3.30	0.10
30	AT RISK	NO	3.00	3.10	0.10
31	NORMAL	NO	4.30	4.30	0.00
32	NORMAL	NO	4.20	4.10	-.10
33	NORMAL	YES	3.90	3.90	0.00
35	AT RISK	YES	1.80	2.20	0.40
36	NORMAL	YES	4.10	4.20	0.10
37	AT RISK	NO	3.50	3.70	0.20
38	NORMAL	YES	3.80	3.80	0.00
39	NORMAL	YES	3.60	.	.
40	NORMAL	NO	3.60	3.50	-.10
41	AT RISK	NO	3.50	3.50	0.00
42	AT RISK	YES	2.60	2.70	0.10
43	NORMAL	NO	3.80	3.80	0.00
44	NORMAL	YES	3.80	4.00	0.20
45	NORMAL	YES	3.60	3.60	0.00
46	NORMAL	YES	3.70	3.60	-.10
47	NORMAL	YES	3.90	4.10	0.20
48	NORMAL	NO	3.90	3.80	-.10
49	NORMAL	NO	3.80	3.80	0.00
50	AT RISK	NO	3.50	3.40	-.10
51	NORMAL	YES	4.40	4.40	0.00
52	NORMAL	NO	3.60	.	.
54	AT RISK	NO	3.40	.	.
56	NORMAL	NO	3.60	3.50	-.10
57	AT RISK	YES	3.20	3.70	0.50

SAS
 LISTING OF DATA
 SUBJECT GROUP: ALL SUBJECTS

SUBJECT	TYPESUBJ	TRT	PRE	POST	CHANGE
58	AT RISK	NO	3.30	3.30	0.00
59	AT RISK	YES	3.30	3.50	0.20
60	NORMAL	YES	3.60	3.90	0.30
61	NORMAL	NO	3.80	3.80	0.00
62	NORMAL	YES	4.40	4.70	0.30
63	NORMAL	NO	3.60	3.70	0.10
64	NORMAL	NO	3.60	3.90	0.30
65	AT RISK	YES	3.30	3.30	0.00
66	NORMAL	YES	4.10	3.90	-.20
67	AT RISK	NO	3.30	3.30	0.00
68	AT RISK	YES	3.00	3.00	0.00
69	AT RISK	YES	2.40	2.50	0.10
70	AT RISK	NO	3.10	3.10	0.00
71	NORMAL	YES	3.70	3.90	0.20
72	AT RISK	YES	3.00	3.80	0.80
74	NORMAL	NO	4.00	4.40	0.40
75	AT RISK	NO	3.30	3.40	0.10
76	NORMAL	YES	3.90	4.10	0.20
77	AT RISK	NO	2.90	2.60	-.30
79	AT RISK	NO	3.20	.	.
80	AT RISK	NO	3.40	.	.
81	AT RISK	YES	3.40	3.40	0.00
82	NORMAL	NO	3.60	3.60	0.00
83	AT RISK	YES	3.10	3.40	0.30
84	NORMAL	YES	4.20	4.40	0.20
85	NORMAL	NO	4.30	4.30	0.00

SAS
LISTING OF DATA
SUBJECT GROUP: ALL SUBJECTS

SUBJECT	TYPESUBJ	TRT	PRE	POST	CHANGE
86	AT RISK	NO	3.50	.	.
87	NORMAL	YES	3.80	3.80	0.00
88	NORMAL	NO	4.00	4.10	0.10
89	AT RISK	YES	3.10	3.30	0.20
90	NORMAL	NO	3.90	3.90	0.00
91	AT RISK	NO	1.90	.	.
92	NORMAL	YES	4.40	4.30	-.10
93	AT RISK	YES	3.50	3.70	0.20
94	NORMAL	YES	3.80	4.10	0.30
95	NORMAL	NO	4.30	4.30	0.00
96	NORMAL	YES	4.20	4.20	0.00
97	NORMAL	YES	3.90	4.00	0.10
98	AT RISK	YES	2.80	3.20	0.40
99	AT RISK	NO	2.80	2.80	0.00
100	AT RISK	YES	2.60	2.70	0.10
101	AT RISK	NO	3.50	3.80	0.30
102	AT RISK	YES	2.40	3.00	0.60
103	AT RISK	YES	2.90	2.80	-.10
104	AT RISK	YES	3.20	3.60	0.40
105	NORMAL	NO	4.10	3.90	-.20
106	AT RISK	NO	3.30	.	.
107	AT RISK	NO	3.20	3.20	0.00
108	AT RISK	NO	3.30	3.50	0.20
109	AT RISK	YES	3.40	3.60	0.20
110	NORMAL	YES	4.10	.	.
111	AT RISK	NO	3.20	3.30	0.10

SAS
 LISTING OF DATA
 SUBJECT GROUP: ALL SUBJECTS

SUBJECT	TYPESUBJ	TRT	PRE	POST	CHANGE
112	NORMAL	NO	3.70	.	.
113	AT RISK	NO	3.20	3.00	-.20
114	NORMAL	YES	3.60	4.60	1.00
115	AT RISK	NO	3.30	.	.
116	AT RISK	YES	3.20	.	.
117	AT RISK	YES	3.40	3.50	0.10
118	NORMAL	YES	3.60	4.10	0.50
119	NORMAL	YES	3.70	3.70	0.00
120	NORMAL	YES	3.60	3.80	0.20
121	AT RISK	YES	3.40	.	.
122	NORMAL	NO	3.60	3.60	0.00
123	AT RISK	NO	3.40	3.60	0.20
124	NORMAL	NO	3.80	3.60	-.20
125	NORMAL	YES	4.20	4.20	0.00
126	AT RISK	NO	2.70	2.70	0.00
127	NORMAL	NO	3.70	3.80	0.10
128	AT RISK	YES	3.30	3.70	0.40
129	AT RISK	YES	3.00	3.20	0.20
130	NORMAL	YES	4.00	4.00	0.00
131	AT RISK	NO	3.50	3.60	0.10
132	NORMAL	YES	3.80	3.90	0.10
133	AT RISK	NO	3.40	3.30	-.10
134	AT RISK	NO	2.50	.	.
135	AT RISK	YES	3.00	3.10	0.10
136	NORMAL	NO	3.70	3.70	0.00
137	NORMAL	NO	3.60	3.60	0.00

SAS
LISTING OF DATA
SUBJECT GROUP: ALL SUBJECTS

SUBJECT	TYPESUBJ	TRT	PRE	POST	CHANGE
138	NORMAL	NO	3.60	3.70	0.10
139	AT RISK	YES	3.50	3.70	0.20
140	AT RISK	YES	3.40	.	.
141	AT RISK	YES	2.90	3.30	0.40
142	AT RISK	NO	3.20	3.20	0.00
143	AT RISK	NO	3.50	.	.
144	AT RISK	NO	3.00	3.00	0.00
145	AT RISK	NO	3.40	3.50	0.10
146	NORMAL	YES	4.40	4.40	0.00
147	NORMAL	YES	3.80	3.90	0.10
148	NORMAL	YES	4.10	4.30	0.20
149	AT RISK	YES	3.30	3.10	-.20
150	NORMAL	NO	3.60	3.50	-.10
151	AT RISK	YES	2.50	2.80	0.30
152	NORMAL	NO	3.70	3.30	-.40
153	AT RISK	NO	3.40	3.40	0.00
154	AT RISK	NO	3.50	3.80	0.30
155	AT RISK	NO	3.40	3.60	0.20
156	AT RISK	YES	1.80	2.00	0.20
200	NORMAL	YES	3.80	4.00	0.20

APPENDIX J
SUMMARY OF DATA: ALL SUBJECTS

SAS
 SUMMARY OF DATA
 SUBJECT GROUP: ALL SUBJECTS

TYPESUBJ	TRT	PRE			POST			CHANGE		
		N	MEAN	STD	N	MEAN	STD	N	MEAN	STD
AT RISK	YES	38	2.94	0.48	34	3.11	0.48	34	0.22	0.20
AT RISK	NO	39	3.15	0.43	29	3.24	0.39	29	0.04	0.14
NORMAL	YES	38	3.95	0.28	36	4.09	0.30	36	0.13	0.21
NORMAL	NO	35	3.83	0.25	30	3.85	0.29	30	-0.00	0.15

SAS
SUMMARY OF DATA
SUBJECT GROUP: ALL SUBJECTS

TYPESUBJ	TRT	PRE			POST			CHANGE		
		MEDIAN	MIN	MAX	MEDIAN	MIN	MAX	MEDIAN	MIN	MAX
AT RISK	YES	3.05	1.80	3.50	3.20	2.00	3.80	0.20	-0.20	0.80
AT RISK	NO	3.30	1.90	3.50	3.30	2.20	3.80	0.00	-0.30	0.30
NORMAL	YES	2.50	1.60	4.60	4.05	3.60	4.70	0.10	-0.20	1.00
NORMAL	NO	3.80	3.60	4.40	3.80	3.30	4.40	0.00	-0.40	0.40

APPENDIX K
SUMMARY OF DATA : SUBJECTS WHO
COMPLETED THE STUDY

SAS
SUMMARY OF DATA
SUBJECT GROUP: SUBJECTS WHO COMPLETED THE TRIAL

TYPESUBJ	TRT	PRE			POST			CHANGE		
		N	MEAN	STD	N	MEAN	STD	N	MEAN	STD
AT RISK	YES	34	2.89	0.49	34	3.11	0.48	34	0.22	0.20
AT RISK	NO	29	3.20	0.33	29	3.24	0.39	29	0.04	0.14
NORMAL	YES	36	3.96	0.28	36	4.09	0.30	36	0.13	0.21
NORMAL	NO	30	3.85	0.26	30	3.85	0.29	30	-0.00	0.15

SAS
 SUMMARY OF DATA
 SUBJECT GROUP: SUBJECTS WHO COMPLETED THE TRIAL

TYPESUBJ	TRT	PRE			POST			CHANGE		
		MEDIAN	MIN	MAX	MEDIAN	MIN	MAX	MEDIAN	MIN	MAX
AT RISK	YES	3.00	1.80	3.50	3.20	2.00	3.80	0.20	-.20	0.80
AT RISK	NO	3.30	2.20	3.50	3.30	2.20	3.80	0.00	-.30	0.30
NORMAL	YES	3.90	3.60	4.60	4.05	3.60	4.70	0.10	-.20	1.00
NORMAL	NO	3.80	3.60	4.40	3.80	3.30	4.40	0.00	-.40	0.40

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Abstract

REDUCING VULNERABILITY FOR BULIMIA AMONG COLLEGE-AGED WOMEN: IMPLEMENTATION OF AN EDUCATIONAL MODEL FOR PREVENTION

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Chairperson: Professor Roger G. Baldwin

The purpose of this study was to assess the effectiveness of an educational program about the selected subjects of basic nutrition, body composition, and management of eating and exercise behaviors on reducing attitudes associated with bulimia in college-aged women.

One hundred and fifty first year women at the University of Richmond in Virginia were invited to participate in a brief yet comprehensive instructional program designed to provide information about eating and exercise behaviors and to enhance self-esteem and foster positive feelings about the physical self.

An instrument called the Body Cathexis Scale was used to measure any changes that might have occurred as a result of this program.

A two-factor analysis of variance was used to analyze results of the study. Responses from individual interviews were also used to assess the effectiveness of this program.

It was hypothesized that the subjects exposed to the educational intervention program would exhibit greater changes in cathexis scale scores than those subjects who were not exposed.

It was concluded from the analyses performed that the subjects exposed to the intervention program exhibited a significantly greater positive change in cathexis scale scores than those who were not exposed to the program. The data support the conclusion that the educational intervention program was significant in reducing the attitudes associated with bulimic behavior.

Further study is needed to evaluate the effectiveness of this program compared to others of a similar nature. In addition, an evaluation of the effects of this type of program upon men and women of all ages is needed.