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PREVENTION OF DISORDERED EATING
AMONG COLLEGE WOMEN:
A CLINICAL INTERVENTION

by

Melanie Anne Nebel

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A Dissertation Submitted to the Faculty of the
DEPARTMENT OF PSYCHOLOGY
In Partial Fulfillment of the Requirements
For the Degree of
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THE UNIVERSITY OF ARIZONA

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SIGNED: Melanie Anne Nebel

DEDICATIONS

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ABSTRACT

A preventative intervention program was administered to a non-clinical population deemed at risk for the development of eating disorders. Two-hundred and three women from a large southwestern state university who belonged to four campus sororities participated in the intervention. Members of the two sorority houses served as the control group while members of the other two houses served as the experimental group during the eight-week intervention. The intervention consisted of five workshops involving risk factors identified with anorexia nervosa and bulimia nervosa. The intervention included workshops on basic information on eating disorders, exercise, stress management, nutrition, self-esteem, and body image. Compared to the control group, the experimental group displayed significantly lower scores on the Ineffectiveness sub-scale and the Bulimia sub-scale of the Eating Disorder Inventory. The present study demonstrated that a population highly susceptible to disordered eating, was open to and positively affected by, an intervention procedure.

INTRODUCTION

Recent years have witnessed such a rapid increase in the incidence of eating disorders that the international Medical News Service has announced that they now constitute a public health problem (Shisslak, Crago, Schnaps, & Swain, 1986). Such disorders encompass three generally recognized categories of afflictions: 1) Anorexia Nervosa, 2) Bulimia Nervosa, and 3) Eating Disorder Not Otherwise Specified (EDNOS) (Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), American Psychiatric Association, 1994). Although patients are typically diagnosed as suffering from a single disorder, it is not unusual to observe their movement from one disorder to another at different points in time (Vandereycken and Pierloot, 1983).

History of Anorexia Nervosa

The first description of what is currently referred to as Anorexia Nervosa is attributed to Richard Morton in 1689. In his book "Phthisiologica or A Treatise of Consumptions," Morton identified patients suffering from "Nervous Consumption" whose menses had ceased after which they experienced a decrease in appetite. They were described as "...a skeleton only clad with skin..." (Silverman, 1987, p. 2830).

Other references to women who apparently suffered from anorexia nervosa appeared between the 13th and 19th centuries. The descriptions were of "fasting girls" (Brumberg, 1986) who exercised prolonged periods of food refusal. Although, it is unclear why such fasting took place, one can speculate that their objectives may have included societal notice and monetary benefit as they were often visited by observers, curious about their intentional emaciation, as well as by religious pilgrims who perceived them as a type of miracle (Russell & Treasure, 1989; Brumberg, 1986).

In his 1868 discussion of medicine, Sir William Gull remarked on "apepsis hysterica" (Gull, 1868). Several years later he went on to publish descriptions of two cases and redefined these patients as suffering from "anorexia nervosa" (Gull, 1874). At about the same time, Lasegue described eight patients also suffering from "hysterical anorexia" (Lasegue, 1873). Finally, in 1892 the term coined by Gull, "Anorexia Nervosa," appeared in Osler's Textbook of Medicine (Osler, 1892).

Silverstein, Peterson, & Perdue (1986) evaluated models depicted in magazines during the period between 1909 and 1925, and suggested that these models tended to have androgynous-like figures. These authors noted that this "flapper"

fashion trend was accompanied by a decrease in the weight of college students as well as an increase in the number of literary articles referring to the self-starvation of school-aged, college, and office working females. Contemporary women's fashion ideals, which bear some resemblance to those of the 1920's, appear to have produced comparable influences. It is these body image influences that are often thought to bear some responsibility for recent increases in this disorder.

Current prevalence rates of anorexia nervosa among female adolescents and young adults are believed to range from 0.5%-1.0% with an average age of onset of 17. Anorexia occurs predominately among women. The prevalence rate among males is substantially lower; it is estimated that approximately 10% of those suffering from the disorder are male (DSM-IV, 1994).

The current DSM-IV criteria for anorexia nervosa is listed Appendix A (DSM-IV, 1994).

History of Bulimia Nervosa

The original use of the word 'bulimia' has been traced by Tobe & Wolinsky (1986) to 370 b.c. The word bulimia was used to describe a "state of profound hunger" (Tobe & Wolinsky, 1986, p. 1647). Tobe et al. (1986) makes the observation that this definition contains no implication that the person was

suffering from any type of psychological disorder, leading one to believe that this describes normally occurring hunger pangs. The definition that most closely relates to our present day diagnosis of bulimia was made by James in the Medical Dictionary of 1743: "'True Bulimus' was characterized by intense preoccupation with food and overeating at very short intervals followed by fainting and a variant, *caninus appetitus*, in which the overeating was terminated by vomiting" (Stunkard, 1990, p. 264). However, bulimia nervosa, as a recognized medical term, was first found in the Oxford Dictionary (1933) in which the term 'bulisme' appeared, as defined by Trevisa, (1398) to describe "A morbid hunger... occurring chiefly in idiots and maniacs..." (Tobe & Wolinsky, 1986, p. 1647).

The characteristics of bulimia nervosa were officially acknowledged in the publication of the Diagnostic Statistical Manual of Mental Disorders-III (DSM-III) in 1980. Until that time bulimia nervosa was not truly considered its own disorder, although overeating and forms of purging were often seen in anorexia patients.

Bulimia is thought to affect 1-3% of female adolescents and young adults. Similar to anorexia nervosa, 10% of those suffering from bulimia are males (DSM-IV, 1994).

The Current DSM-IV diagnostic criteria for bulimia nervosa is found in Appendix B.

In addition to the identification of anorexia nervosa and bulimia nervosa, the DSM-IV describes a diagnosis of eating disorder not otherwise specified (EDNOS). This category is defined as including individuals suffering from eating disorders which do not meet the criteria for any specific eating disorder.

Etiology

The etiology of eating disorders is often considered to include biological, psychological and social determinants, and eating disorders are currently understood in terms of a Biopsychosocial model. To appreciate more readily the integrative perspective of the bio-psycho-social model, each component (i.e. biology, psychology, and sociology) will be independently described.

Biology. Biological factors associated with the development of eating disorders are not well-established. A variety of endocrine abnormalities such as amenorrhea and thyroid function abnormalities, are apparent in some patients. However, these biological abnormalities are thought primarily to be side effects of symptomatic behaviors and reversible once these behaviors are halted (Mitchell, 1985; Johnson &

Connors, 1987).

The co-occurrence of maladaptive eating attitudes and depressive symptomatology has been identified and referred to as a potential risk factor for clinical eating disorders (Szmukler, 1987). This relationship between affective disorders and eating disorders may find some support in the fact that some eating disorder patients respond favorably to anti-depressant medication. Strober and Katz (1987) proposed that depression may trigger eating disorders in vulnerable adolescents. They reasoned that dietary restraint resulting in a loss of weight would be perceived as an achievement. This sense of accomplishment provides a temporary shield from depression, reinforcing the dietary behavior, causing an even greater sense of achievement, and possibly further disordered eating patterns. An alternative hypothesis suggests that eating disorders precede depression and that the physical consequence of starvation with respect to specific neurotransmitter and or neuroendocrine systems results in depression in genetically vulnerable individuals (Strober and Katz, 1987).

Explanations involving a genetic component are suggested as well. The prevalence of major affective disorders among first-degree relatives of eating disorder patients tends to be

higher than among non-eating disordered patients (Hudson, Pope, Jonas, Yurgelun-Todd, and Frankenburg, 1987; Devlin and Walsh, 1989). Furthermore, Gershon, Hamovit, and Screiber, (1983) found that affective disorders were the most prevalent psychiatric disorder among relatives of subjects with anorexia nervosa. The fact that there is a high incidence of affective disorders among first degree relatives is not conclusive evidence, of course, that the cause of eating disorders is genetic. Exposure to similar environmental risk factors could also account for such findings.

Psychology. Many factors constitute the psychology of individuals suffering from eating disorders. Such elements as self-esteem and body dissatisfaction are typical examples and perhaps major psychological components influencing disordered eating patterns. The extent to which such broadly defined factors influence the development of an eating disorder is ambiguous. However, similarities appear to exist regarding family environments.

Family environments in which some eating disorder patients are raised tend to be described as "disengaged, chaotic, neglectful, high in achievement orientation, and deficient in problem solving skills," which "generally result in children feeling disorganized, disconnected, insecure and

anxious" (Johnson & Connors 1987. p. 137). Johnson and Felch (1985) found that eating disorder patients described their families as high in conflict and low in expression. These results were illustrated through these families enduring significantly greater dissension among family members and their dismay to discuss such conflicts.

Johnson & Connors (1987) suggest that a child who can depend upon their socio-cultural environment to maintain consistency and stability may be able to compensate for the deficits within his or her immediate environment. Unfortunately, for young women, current socio-cultural influences "exacerbates feelings of instability" (Johnson & Connors, 1987, p. 138) leading women to adapt to their environment in a destructive manner.

Sociology. While the biological and psychological factors are as relevant to men and women of any culture, it is only when they are considered in the context of western culture and specifically to the values imposed upon and held by women that they begin to take on new meaning.

Beginning in the 1960's, the perceived ideal body shape for women has become "progressively" thinner. Garner, Garfinkel, Schwartz, and Thompson (1980) evaluated models used in popular fashion magazines over a 10 year period. The

fashion industry tended to utilize progressively thinner models over the course of this period despite the fact that the average American female had actually increased in weight. Thus, unrealistic body ideals who displayed in fashion magazines became that difficult to emulate. Ironically, the current body ideal (i.e. thinness) is biogenetically impossible for most women to achieve.

Traditionally, women have considered physical attractiveness the primary modality of success (Mori, Chaiken, and Pliner, 1987; Nagel and Jones, 1992). The attitude of Western society, which treats thinness as synonymous with success, has resulted in pressures which put women at greater risk of developing eating disorders (Cantrell and Ellis, 1991).

Wooley and Wooley, (1984) for example, surveyed 33,000 women. When subjects were asked what would make them happiest, 42% expressed "losing weight", whereas 22% answered "work success". Furthermore, 63% of those surveyed reported that their weight significantly affected their potential for success in their personal and professional lives.

Western society has reinforced the extreme importance of being thin in regard to professional success. There have been incidents of women denied job opportunities or terminated from

employment as a result of their being overweight. Among employers surveyed, it was reported that obese persons were less desirable employees (Larkin and Pines, 1979). In fact, 16% of employers reported that under no circumstances were they willing to hire obese women (Roe and Eickwort, 1976). Furthermore, 44% were unwilling to hire them under certain conditions (Roe and Eickwort, 1976). These results illustrate the inordinate importance women place on thinness by virtue of internalization of the inappropriate standards of their society and that cultural emphases on thinness may actually be *promoting* rather than *preventing* eating disorders (Shisslak and Crago, 1994).

Numerous risk factors for eating disorders are currently thought to exist. Unfortunately, no one specific cause or set of factors have been firmly established. However, there are several factors that appear to contribute to these disorders (e.g. self-esteem, body dissatisfaction).

Nevertheless, at this point in time it would be prudent to attempt preventive interventions aimed at factors which appear to be related to the development of eating disorders.

Risk Factors

Up to the present, research has failed to identify a single causal factor which directly results in an eating

disorder. Although the literature categorizes risk factors for eating disorders as socio-cultural, developmental, psychological, biological (Streigel-Moore, Silberstein, and Rodin, 1986), and familial (White, 1992), assigning specific risk factors to the various categories mentioned in the literature is difficult. This difficulty occurs because individual risk factors are generally not associated exclusively with a particular category. For example, the onset of depression may result from biological or environmental influences. Nevertheless, existing studies are attempting to confirm the cause-effect relationship among the various factors in question. Yet, to develop a more thorough understanding of the various risk factors and their causal effect (if any), additional research is necessary. This will likely aid in the detection, prevention, and treatment of eating disorders. The most effective solution to confirm particular causal factors would be longitudinal studies, which have yet to be completed.

Many psychosocial issues that are deemed to be important (e.g. family issues) in the lives of individuals with eating disorders are more appropriately dealt with in the context of intensive psychotherapy rather than a large scale intervention (Shisslak, 1995). Since the current study involved a limited

intervention program administered to a large group, it would seem unrealistic to incorporate factors such as familial issues. Therefore, the study consisted only of five principal areas which do appear to play integral roles in eating disorders and may also be amenable to a large scale intervention study. These factors include:

- 1) Lack of knowledge regarding proper exercise patterns - An increased level of exercise has been associated with the onset of eating disorders. Furthermore, engaging in excessive amounts of exercise can be considered a form of purging much like vomiting and the abuse of laxatives and diuretics (Kratina, 1991).
- 2) Inappropriate stress management - Individuals suffering from eating disorders have difficulty in coping with stressful situations. Such stressful events are often reported as triggers for eating disorder symptomatology (Katzman, 1989).
- 3) Lack of nutritional information - A lack of accurate nutritional information may lead to inappropriate dietary restraint. A propensity to engage in chronic dieting has been noted as a factor which contributes to the development of eating disorders (Collins, 1988).
- 4) Distorted body image - Distorted body image disturbance has been identified as a benchmark for eating disorders (Garner

and Garfinkel, 1982). In addition, a strong, correlation between body dissatisfaction and the Drive for Thinness subscale of the EDI was found significantly related to the development of eating disorder symptoms over a three year period (Killen et al., 1987).

5) Low self-esteem - Low self-esteem has been associated with excessive dieting (Hartley, 1989), disturbed eating behaviors (Fabian and Thompson, 1989) and anorexia nervosa (Grant and Fodor, 1986).

The association between each of the five risk factors mentioned above and their relationship to the development of eating disorders will be discussed in detail, as they are critical to the preventive intervention implemented in the present study.

Lack of Knowledge Regarding Proper Exercise Practices

Several authors (Epling and Pierce, 1988; Streigel-Moore, Silberstein, and Rodin, 1986; Yates, 1989) suggest that society's focus on exercise and fitness may be one factor directly related to the increased prevalence of eating disorders.

Not only has physical fitness become a cultural pursuit, but a profit-earning industry as well. Health clubs, sporting-good industries, magazines, clothing manufacturer and

sports-injury clinics have flourished in the past 20 years (Yates, Leehy, and Shisslak, 1983; Yates, 1987). Kratina (1991) has called this the "age of fitness". Within the current zeitgeist, many individuals are admired for being able to dedicate themselves to exercise. Compared to the use of laxatives and vomiting, one who uses excessive exercise as a form of purging can actually flaunt it in front of others and receive positive reinforcement (Kratina, 1991). Elevated levels of exercise are often associated with anorexia (Baird and Sights, 1986; Ching, 1963; Crisp, Hsu, Harding, and Hatshorn, 1980; Crisp and Kalucey, 1980; Gross, 1982; King, 1963; Long and Smith, 1990; Pasman and Thompson, 1988; Roy-Byrne, Lee-Benner, and Yager, 1984; Szymanski and Chrisler, 1990) and the DSM-IV identifies exercise as a form of purging. In addition, the amount of time spent on exercise has been shown to correlate positively with total scores on the Eating Attitudes Test.

Several different views regarding the relationship between exercise and disturbed eating behavior emerge from the literature. Some authors have suggested that excessive exercise may precipitate the development of an eating disorder (Katz, 1986; Touyz, Beaumont and Hooks, 1987; Kron, Katz, Gorzynski, and Weiner, 1978). In an early study, Kron et al.

(1978), examined the exercise patterns of 33 women who had previously been hospitalized for anorexia. Twenty-five of these women were found to have engaged in strenuous daily exercise during their illness and 21 women reported "excessive activity" prior to the onset of their eating disorder.

Additionally, Katz (1986) reported two case studies of men who acquired eating disorders following their involvement in long-distance running. One man, a 32 year old physician, initially weighing 174 lbs. (5'9"), felt he was not exercising frequently enough. As he increased his jogging to 35 miles per week, he lost weight, and soon became obsessed with caloric consumption and diet. He increased his jogging to 50 miles per week, and dropped to a weight of 115 lbs. Still he complained of feeling fat, and began to binge and vomit on a regular basis. The second man was involved in high school athletics and later joined the cross-country team at college. He became preoccupied with his weight (5'10", 150 lbs.) during his junior year, and began running 80-90 miles per week. After losing weight, he began running an additional 10 miles each week and dropped to a final weight of 125 lbs. His mood became depressed. He began to binge and vomit regularly. His extreme preoccupation with weight eventually led him to seek professional counseling.

Another idea relating exercise and eating disorders is that, like vomiting and the use of laxatives and diuretics, exercise is a means by which to purge. Often, changes in diet are paralleled by changes in exercise patterns (Beaumont and Booth, Abraham, Griffith, and Turner, 1983). An increase in daily caloric intake, for example, might be followed by a bout of especially vigorous exercise.

Still another hypothesis emphasizes the use of exercise as a means by which to manage the discomfort of hunger in individuals with eating disorders (Epling and Pierce, 1988; Yates, 1989). Consistent with this notion is the finding that prolonged exercise can result in an increase of endogenous opiates, leading to a decrease in hunger (Yates, 1989).

Inappropriate Stress Management Skills

The amount of stress that individuals with eating disorders experience can be as great as $2\frac{1}{2}$ times that of their non-eating disordered counterparts (Strober, 1984; Soukup, Beiler, and Terrell, 1990). This fact becomes important when it is considered that discrete stressful events may serve as triggers for bulimia and for eating binges (Abraham and Beaumont, 1982; Johnson, Stuckey, Lewis, and Schwartz, 1982; Crowther and Chernyk, 1986; Pyle, Mitchell, Eckert, 1981; Stunkard, 1959; Wilson, 1976; Wolf and Crowther,

1983). Katzman (1989) hypothesized that stressful situations may result in a disinhibition of dietary rules that result in binge eating. In addition, it is proposed that the development of clinical eating disorders may reflect an underlying lack of adaptive coping patterns (Hawkins and Clement, 1984; Caffary, 1987). The essential idea is that those who lack more adaptive coping mechanisms and problem-solving abilities may turn to bulimic behaviors in order to find additional control and momentary relief through bingeing and purging (Streigel-Moore, Silberstein, and Rodin, 1986; Guyton, Corbin, Zimmer, O'Donnell, Chervin, Sloane, and Chamberlin, 1989). Lack of adaptive coping mechanisms in the face of elevated stress levels places these individuals at high risk.

Soukup et al. (1990) for example, evaluated coping skills and problem solving abilities in 45 eating disordered patients. Patients completed several questionnaires including the Derogatis Stress Profile which measures the perceived amount of stress in an individual's life, and the Problem Solving Ability Inventory, which evaluates a persons beliefs about their own problem solving abilities. Eating disorder patients indicated significantly higher levels of anxiety and stress as well as greater distress in handling stressful

situations than non-eating disordered university women on both of these measures. It is not surprising to see these difficulties in coping with problem solving skills since eating disorder patients tend to exhibit greater anxiety in stressful situations.

Killen, Taylor, Telch, Saylor, Maron, and Robinson, (1987), in their study of adolescents provide further evidence to support this conclusion. Stress coping mechanisms, levels of stress and anxiety, amount of drug use, and purging behaviors were assessed among 646 female 10th grade students. Students who reported engaging in purging behavior also reported more intense reactions to stressful events, greater levels of affective distress, more stressful events in their lives, and a higher incidence of alcohol abuse than females reporting no purging behavior. This latter relationship between eating disorders and drug abuse may be indicative of self-medication to provide symptom relief; female purgers used alcohol to relieve stress more often than non-purgers. Furthermore, these subjects reported significantly greater psychological distress and physical discomfort.

Societal influences may play a pivotal role in the relation between stress and eating disorders. Today's Western culture is 'achievement oriented'; messages from omnipresent

sources create a competitive environment by encouraging people to 'be the best'. Individuals predisposed to eating disorders are apparently highly susceptible to these influences as evidenced by the perfectionism that tends to permeate their lives. For example, adolescent females diagnosed with eating disorders described placing greater pressure on themselves to receive good grades, hold student government offices, have a thin appearance, and to be popular than their peers (Hornyak and Baker, 1989). The amount of stress that these individuals place on themselves is so great that Sandbek (1986) proposed that this pressure should be alleviated before effective therapy can be pursued. Providing information on the link between stress and eating disorders, and fostering more adaptive and effective coping skills among student populations is necessary for prevention of anorexia nervosa and bulimia (Katzman, 1985).

Lack of Nutritional Information

Many of the harmful nutritional practices engaged in by young women stem from misdirected efforts at restrictive dieting, often in an attempt to attain society's prized but decidedly underweight and unhealthy idealized female form. In accordance with the socio-cultural differences that exist among men and women, it is not surprising to find that

nutritional practices differ by gender; significantly more female than male students reported rarely eating breakfast, and consuming salads as the main meal when eating in restaurants (Leon, Perry, Mangelsdorf, and Tell, 1989).

Excessive dieting, of course, is a hallmark of the clinical eating disorders. Leon et al. (1989) conclude that the lack of nutritional information and the poor nutritional practices associated with dieting may be precursors to the development of an eating disorder. Moreover, authors suggest that a general increase in dieting among children and adolescents may be responsible for the recent increase in the overall incidence of eating disorders (Hsu, 1990; Lask and Bryant-Waugh, 1992). Vulnerability toward development of an eating disorder has also been enhanced by lack of nutritional information as well as the presence of erroneous information.

Skinner and Woodburn (1984) assessed 1,193 students ability to correctly identify nutritional concepts such as nutrients, energy sources, and nutritional misconceptions. Students had difficulty identifying a nutritional meal for an adolescent attempting to lose five pounds. Calories were often described as the fat amount contained in foods. Overall, results demonstrated that students did not possess accurate nutritional knowledge and that a greater

concentration on nutritional learning needs to be provided.

Misconceptions of nutritional information is evident among university populations as well. Osman and Ahrens (1972) evaluated 1,331 student responses to statements regarding nutritional concepts. The statement that students had the greatest misconception of was "Potatoes are a fattening food". Almost 85% of these students believed this statement to be true. The authors concluded that for students to properly learn and understand nutritional information they should not only be made aware of frequent nutritional misconceptions but also offered current information explaining the misconceptions.

Several authors have described the benefits of nutritional education in the treatment (Hsu, Holben and West, 1992; Hsu, Santhouse, and Chesler, 1991; Rock and Yager, 1987; Roy-Byrne, Lee-Benner, and Yager, 1984) and prevention (Shisslak, Crago, and Neal, 1990; Nagel and Jones, 1992) of eating disorders. School-based programs and the promotion of healthier nutrition and exercise habits among adolescents have achieved encouraging results. For example, in Monterey, California, two classes of tenth grade students participated in a program promoting dietary change (King, Saylor, Foster, Killen, Telch, Farquhar, and Flora, 1988). Students were

randomly assigned to either an intervention program or an assessment-only control group. The intervention consisted of five sessions of dietary information and cognitive-behavioral techniques for modifying dietary practices. Topics included such things as diet information, food myths, self-appraisal of dietary patterns, and problem-solving techniques for behavior change. At the conclusion of the intervention, significant differences were found when comparing the students in the intervention and control groups. Compared to controls, students in the intervention group displayed greater nutritional knowledge, improved dietary behaviors, and an increase in the amount of healthy foods available in the home. The authors conclude that behavioral and environmental changes may be effective in promoting healthier dietary practices at school and at home. It seems clear that complete and accurate nutritional counseling should be part of any intervention.

Distorted Body Image.

A substantial number of studies indicate that individuals with disordered eating patterns have greater body image distortions than those without such problems (Clement and Hawkins, 1980; Herzog, 1982; Kearney-Cooke, 1989; Lask and Bryant-Waugh, 1992; Mizes, 1988; Russell, 1979; Yates, 1989). People who exhibit disordered eating behavior frequently have

dysfunctional perceptions of their physical appearance (Cash and Brown, 1987; Garfinkel and Garner, 1982). Body image disturbances regarding weight and shape may be precursors to anorexic and bulimic behavior (Bruch, 1973; Druss and Silverman, 1979; Fairburn, Cooper and Cooper, 1986; Garfinkel and Garner, 1982; Grant and Fodor, 1986; Kearney-Cooke, 1989). According to Wait (1992), women believe that if their bodies are perfect (i.e. thin) their lives will be perfect. Fifty to sixty percent of women in their normal weight range, (as usually determined by the Metropolitan Life Tables), consider themselves fat (Wait, 1992). Therefore, these who are at a healthy and appropriate weight consider themselves overweight and thus, imperfect. It is primarily women who are actually 10% or more below their normal weight who are pleased with their body.

Brown, Cash, and Lewis (1989) investigated female adolescents' perceptions of their body. Subjects were divided into two groups: those who binge-purge and a matched control group whose members rarely or never purge. Results indicated that binge-purgers perceived themselves as heavier, reported more dissatisfaction with their weight, and had a greater fear of weight-gain than control subjects. Brown et al. (1989) concluded that, while all subjects tended to overestimate

their body size, this tendency was more common among those engaged in bingeing and purging.

Gross and Rosen (1988) examined the relationship between eating disorders and body dissatisfaction among 1,373 high school students, using the Eating Attitudes Test (EAT), the Eating Disorder Inventory (EDI), Beck Depression Inventory, Social Anxiety and Distress Scale, Rosenberg Self-Esteem Scale, and the Body-Cathexis Scale. They report that, of all the tests used, the Body Dissatisfaction sub-scale of the EDI best predicts disturbed eating patterns. Bulimia was associated with subjects' negative feelings centered primarily on buttocks, hips, and thighs. Female subjects with bulimia identified more negative feelings about their bodies, greater disturbances over perceived fatness, and were overall less satisfied with their bodies than those females not suffering from the disorder.

The level of body dissatisfaction among women seems to be a rising trend. Cash, Winstead, and Janda (1986) compared the results of a 1972 survey with the results of the same survey given in 1985. On average, subjects in the 1985 survey were more dissatisfied with their body image than those who responded in 1972. In both studies, the results indicated that young women were the most concerned about the way they

looked.

Levine, Smolak, and Hayden (1994) illustrated the significant impact socio-cultural values can have upon body image. Fashion magazines, which illustrate societal ideals, were regularly read by 61% of middle school girls surveyed from working and middle-class families. Seventy percent of these girls reported the importance of the magazines as a source of beauty information and ideals regarding attractive body shape. These results become of great concern when the recent history of body shapes of fashion magazine models is evaluated.

Garner, Garfinkel, Shwartz, and Thompson (1980) evaluated models used in popular fashion magazines. The fashion industry tended to utilize progressively thinner models over the course of a 10 year period, despite the fact that the average American female had actually gotten heavier. Thus, the body ideals as displayed in fashion magazines became more unrealistic and difficult to simulate.

Low Self-Esteem

Low self-esteem is common among individuals with eating disorders and those who binge eat (Crowther and Chernyk, 1986; Edelman, 1981; Gormally, Rardin and Black, 1980; Gross and Rosen 1988; Katzman, Weiss, and Wolchik, 1985; Leon, Eckert,

Teed, Varco, and Buchwald, 1980; Mizes, 1988; Noppa and Hallstrom, 1981; Ondercin, 1979; Smart, Beaumont, and George, 1976; Wadden and Lucas, 1980; Weiss and Ebert, 1983). Johnson and Connors (1987) note the ubiquity of self-esteem issues among bulimic patients and observe that, as the development of bulimia progresses, self-esteem tends to worsen. Furthermore, Baird and Sights (1986) found that eating disorder patients consider low self-esteem to be a pervasive issue in their lives. Improvement of self-esteem is considered to be an essential aspect of treatment for eating disorders.

Low self-esteem may likely play a causal role in the development of eating disorders. Grant and Fodor (1986) evaluated adolescent females responses to the Eating Attitudes Test (EAT), the Eating Disorders Inventory (EDI), and Lerner Scales I, II, and III. These authors conclude that self-esteem, measured by the Lerner Scale II, is the best predictor of "tendencies toward anorexic behavior" (p. 279) as determined by the EDI, in this group. In another study, Fisher, Schneider, Pegler, and Napolitano, (1991), evaluated high school students responses to the EAT, the Rosenberg Self-Esteem Scale, and the State-Trait Anxiety Inventory for Children. Abnormal eating patterns were negatively correlated with self-esteem. Finally, Kagen and Squires (1983) found a

relationship between feelings of failure and disordered eating patterns among high school students. Specifically, feelings of failure were the best predictor of disordered eating as measured by the EAT.

One possible explanation for results such as these is that low self-esteem promotes impulsive behaviors which, in susceptible individuals, can take the form of restricting, bingeing, and purging (Ellis, 1974). Another explanation could be that individuals with low self-esteem have a increased desire to gain better control over their lives. This desire then takes the form of achieving better control over ones body, potentially leading to disordered eating behaviors.

The greater problem of self-esteem among women, as compared to men, may in part be due to female socialization roles in Western culture. As children, boys learn that they receive praise for being athletic and strong, whereas girls are taught to value appearance. As a result of this socialization process, women feel less independent and lack confidence in their abilities, leading to lower self-esteem (Boreman and Guido-DiBrito, 1986). Furthermore, women are constantly receiving messages from the mass media to improve themselves. These messages tell women that they are not good

enough the way they are and that they must improve themselves (usually on a superficial, cosmetic level) so that they will be accepted by others. Clearly, the focus on appearance and thinness for women in terms of self-worth can have disastrous consequences. As Jean (1983, pg. 39) has commented, development of eating disorders among American women can be considered a "logical response to a crazy system".

At Risk Populations

College Students. Several studies have identified high rates of eating disorders among college populations (Halmi, Falk, & Schwartz, 1981; Katzman, Wolchik, & Braver, 1983; Pope, Hudson, Yurgelun-Todd, & Hudson, 1984; Gray & Ford, 1985; Mintz & Betz, 1988). Studies evaluating the prevalence of eating disorders among college populations have found incidence rates ranging from 1.3% (Schotte & Stunkard, 1987) to 19% (Halmi et al. 1981), with an average of approximately 5%.

In 1981 Halmi et al. surveyed 355 college summer school students. The ages of the summer school students ranged from 14 to 67 years, ($\mu=25.6\pm 10.7$). They developed a 23-item questionnaire designed to obtain information regarding symptoms of bulimia nervosa, use of diet aids and medications, weight changes in the past year, and a history of lowest and

highest weights. Information such as physical stature and demographic information was also gathered. Nineteen percent of the female population surveyed reported all major symptoms of bulimia nervosa.

It is important to note that this study was conducted in 1981, requiring the use of DSM-III. Current diagnosis criteria which are more stringent, may affect the prevalence of eating disorders. Additionally, Halmi et al. (1981) used a summer school population with ages ranging from 14 to 67 years ($\mu=25.6\pm10.7$), a group which is not necessarily representative of a typical college population.

The validity and reliability of questionnaires used to evaluate the presence anorexia nervosa and bulimia nervosa have not been established (Halmi, 1981; Schotte & Stunkard, 1987; Gray & Ford, 1985). This raises uncertainty about the results of these surveys. It is possible that prevalence rates noted could include false-positives as most studies involve only self-report questionnaire data. For example, Schotte (1987) evaluated 1,965 college students. Subjects completed a self-report questionnaire designed to identify those suffering from bulimia nervosa. However, when interviews were conducted with 50 students, 22% who met either DSM-III or DSM-III-R criteria for bulimia on the self-report questionnaire

failed to meet criteria on interview.

Sororities. A subclass of college students which have received little attention with respect to eating disorders are women who are members of a sorority, despite the fact that women belonging to sororities have been identified as a high risk sub-group for the development of eating disorders (Shisslak & Crago, 1994).

A substantial number of college women choose to join the sorority system, which at many universities represents a sub-culture with its own set of norms and values. To become a member of a given sorority, women must participate in "rush". Rush is a selection process in which sorority members invite certain women to join their organization. Many sorority women admit that they are looking primarily for physical attractiveness combined with social skills in potential members (Risman, 1982). Sororities place considerable emphasis on factors such as physical attractiveness and thinness (Carter & Eason, 1983). "Through rush, each woman learns that the important ingredients for a woman's success, *for her own success*, are physical attractiveness, social skills, and social class" (Risman, 1982, p.237). In general, the attitude of students is to arrange sororities in an unofficial hierarchy based on the above factors. Thus, there

is prestige associated with membership in particular sororities.

Participation in a sorority can result in continuous comparison to others. Membership in a given sorority may be associated with certain stereotypes (e.g. friendly, pretty, thin). Women may feel obligated to fulfill these standards in order to be accepted. In such a social system where acceptance from others plays such an important role there may exist a constant evaluation of one's self in relation to others and/or in relation to today's ideal body image; this may promote the occurrence of eating disorders. Carter and Eason (1983, p.113) found that sorority members who vomit when compared to non-vomiters "...envy other people...". Risman (1982) discusses sororities in the context of Shurr's (1971) description of the consequences of internalizing stereotypes whereby "...behavior is increasingly organized 'around' the role, and that cultural expectations attached to the role have come to have precedence..." (Shurr, 1971, p.69). Much like a woman who feels she must maintain a low weight to excel as a ballet dancer, so might a college woman have similar feelings in order to belong to the sorority of her choice. Thus, sorority membership may aggravate or accentuate eating disorders among the women who are already at increased risk

for developing them by virtue of their college experience.

In preparation for the current study, pilot data were collected which suggested that sorority women do indeed represent a sub-class of a college group who are particularly susceptible to the development of eating disorders. Clinical or sub-clinical rates for bulimia in sororities were found to be 12.5%, with 14.8% of this population classified as extremely "weight preoccupied" (Nebel, 1992); the incidence of eating disorders among general college populations is approximately 5%. Despite the fact that college populations, and particularly sorority women, have been identified as high risk groups, relatively little research and no well controlled intervention studies have been attempted. The current study seeks to redress this deficit.

Prevention

Steiger, Leichner, Ghadirian (1987 p.145) define three separate types of possible prevention interventions:

1) Primary - consists of early interruption of the chain of factors which causes a disorder before the onset of symptoms.

2) Secondary - reduces the prevalence of a disorder through early detection and prompt effective treatment.

3) Tertiary - consists of rehabilitation designed to

promote a return to the highest-possible level of functioning following the onset of the disorder.

An attempt to engage in a secondary prevention program appears to be particularly fruitful since it imposes the opportunity to have a major impact on a high risk college population. With respect to secondary prevention of eating disorders, few studies have investigated their potential effect.

Shisslak, Crago, and Neal (1990) implemented an eight-week pilot study to assess the impact of an educational and preventative program associated with eating disorders. Fifty high school sophomores were educated as to several different aspects of eating disorders (e.g. risk factors, medical complications) during their health class over an eight week period. The school's faculty and staff received four presentations to educate them on eating disorders as well. Upon completion of the eight-week program, the intervention and control group (131 sophomores who were enrolled in a driver education and physical education class) completed a questionnaire which evaluated the impact of the program. The experimental group participants exhibited a higher capability to correctly answer questions related to eating disorders. These results suggest that intervention programs can be

effective in educating students. However, several aspects of the pilot study demand closer attention. The subjects involved in the study were not randomly assigned to control and experimental groups, making the design of the study quasi-experimental. Alternative hypotheses for the results may exist. For example, the subjects in the experimental group were students in a health class. It is possible that students who chose to enroll in the health class may have had greater personal interest in such topics such as eating disorders.

Shisslak et al. (1990) indicate that such interventions may aid in the prevention of eating disorders. In order to conclude that the intervention was effective as a preventive technique, a change in behavior would have to be demonstrated. It is quite possible that the results of this study merely were indicative of the fact that the subjects knew that right answer rather than any occurrence of behavior modification. Therefore, follow-up studies are necessary to confirm whether the information received by the experimental group affected or prevented disordered eating behavior.

School-based prevention programs and the promotion of healthier nutrition and exercise habits among adolescents have achieved encouraging results. In Monterey, California, two classes of tenth grade students participated in a program

promoting dietary change (King, Saylor, Foster, Killen, Telch, Farquhar, and Flora, 1988). Students were randomly assigned to either an intervention program or an assessment-only control group. The intervention consisted of five sessions of dietary information and cognitive-behavioral techniques for modifying dietary practices. Topics included diet information, food myths, self-appraisal of dietary patterns as well as problem-solving techniques for behavior change. At the conclusion of the intervention, significant differences were found between the students in the intervention and in the control groups. Compared to controls, students in the intervention group displayed greater nutritional knowledge, and improved dietary behavior. In addition, students in the intervention program displayed behavioral changes such as choosing healthier school snacks and increasing the amount of healthy foods within the home. The authors conclude that behavioral and environmental changes may be effective in promoting healthier dietary practice. Behavior was in fact modified by the education program and the correlation appears to discount any alternative factors which might have induced the behavior other than the preventive program. However, the authors conclusion is perhaps over-broad in so far as there were no actual environmental changes.

Purpose of this study

The current study is designed to assess the efficacy of a prevention program based on the characteristics and deficits discussed above (inadequate exercise information, poor stress management skills, lack of appropriate nutritional information, low self-esteem, and distorted body image). These characteristics appear to be core features of eating disorders and a comprehensive prevention program should address each of them (Hotelling, 1989).

This study implements and evaluates the immediate effect of an eight-week preventive intervention. The long-term goal of the intervention is to prevent the development of disordered eating through education regarding five risk factors which have been identified by the literature as prominently effecting the development of disordered eating. The short term objective is to improve subjects' status on the five risk factors. A high risk population (i.e. sorority women) received instruction in the general features of clinical eating disorders, proper nutrition, and healthy exercise practices. They also participated in experiential workshops intended to improve body image, self-esteem, and stress management skills.

Specifically, I hypothesized that information offered to

subjects regarding eating disorders, nutrition, stress management skills, exercise, techniques to increase self-esteem, and improvement of body image will affect test scores in the following manner:

1. Subjects scores on the Drive for Thinness sub-scale of the Eating Disorder Inventory (EDI, Garner & Olmstead, 1984) would decrease as compared to the control group.
2. Subjects scores on the Body Dissatisfaction sub-scale of the EDI would decrease as compared to the control group.
3. Subjects scores on the Ineffectiveness sub-scale of the EDI would decrease as compared to the control group.
4. Subjects scores on the Bulimia sub-scale of the EDI would decrease as compared to the control group.
5. Subjects score on the Rosenberg's Self Esteem Scale (Rosenberg, 1965) will increase as compared to the control group.
6. Subjects knowledge of specific information offered throughout the workshops regarding exercise, nutrition, stress management, and self-worth would improve as compared to the control group.

METHOD

Subjects

Subjects consisted of women belonging to four sororities at a large southwestern state University. Members of two sororities served as the control group and members of two sororities served as the experimental group. A total of 161 women in the experimental group and 144 women in the control group participated in the pre-test (N=305). Of the total number of subjects who completed the pre-test, 113 experimental subjects and 90 control subjects also completed the post-test. Only the data concerning those subjects who completed both the pre- and post-tests were included, resulting in a total of 203 subjects (68%).

Members of the four sororities involved in the intervention constituted a homogenous group. This was confirmed by the analysis showing no statistically significant differences between the control and experimental groups regarding height, weight, age, and GPA (Table 1a), ethnic backgrounds, year in sorority, or which region of the United States they grew up (Table 1b).

Insert Table 1a about here

Insert Table 1b about here

Instruments

All subjects completed a series of questionnaires during the initial phase of the study (Appendix C and Appendix D). At the study's conclusion, all subjects again completed the questionnaires as well as demographic information (Appendix E and Appendix F).

The series of questionnaires consisted of the following six instruments:

Eating Disorder Inventory (EDI, Garner, 1984, p. 5-6).

The EDI is a self-report assessment that measures symptoms that are frequently associated bulimia nervosa and anorexia nervosa. The EDI consists of 64 questions divided into eight sub-scales:

- 1) Drive for Thinness. This sub-scale "assesses excessive concern with dieting, preoccupation with weight, and fear of weight gain".
- 2) Bulimia. This sub-scale "assesses the tendencies to think about and engage in bouts of uncontrollable eating".
- 3) Body Dissatisfaction. The Body Dissatisfaction sub-scale

"measures dissatisfaction with the overall shape and with the size of those regions of the body that are of the greatest concern to those with eating disorders (i.e. stomach, hips, thighs, buttocks)".

4) Ineffectiveness. This sub-scale "assesses feeling of general inadequacy, insecurity, worthlessness, emptiness, and lack of control over one's life".

5) Perfectionism. Perfectionism assesses "the extent to which one believes that personal achievements should be superior".

6) Interpersonal Distrust. This sub-scale measures "an individual's general feelings of alienation and reluctance to form close relationships".

7) Interoceptive Awareness. Interoceptive awareness measures "confusion and apprehension in recognizing and accurately responding to emotional states. It also taps uncertainty in the identification of certain visceral sensations related to hunger and satiety".

8) Maturity Fears. The maturity sub-scale of the EDI "assesses the desire to retreat to the security of childhood".

Among female non-patients the internal consistency of the sub-scales of the EDI range from .65 to .93 (Garner & Olmstead, 1984; Raciti & Norcross, 1987; Vanderheyden, Fekken & Boland, 1988). Test-retest reliability in non-patient

samples has been found to range from .41 to .97 (Welch, 1988; Wear & Praz, 1987; Crowther, Lilly, Crawford, Shepherd & Oliver, 1990). Research conducted to establish the validity of the EDI for clinical utility has been insufficient (Eberly & Eberly, 1985). However, in a comparison of anorexic patients, male college subjects and female comparison subjects, the anorexic group had significantly higher scores ($p > .001$) than the male college subjects and female comparison subjects (Garner, 1984). The EDI was used in this study primarily because it can serve in non-clinical settings to identify individuals who either have subclinical eating problems or who are at high risk for developing eating disorders (Appendix C).

Rosenberg Self Esteem Scale. This scale consists of 10 items assessing global self-esteem. These items are measured on a four point scale; subjects either strongly agree, agree, disagree or strongly disagree to questions regarding attitudes and beliefs of self-worth. Alpha reliability coefficient = .81 & .83. Questions from the Rosenberg Self Esteem Scale correspond to items #81-91 of Appendix D.

Taylor-Manifest Anxiety Scale (1953). This scale consists of 50 items to which subjects respond true or false. The scale incorporates items from the Minnesota Multiphasic

Personality Inventory designed to determine trait anxiety. Test-retest scores yielded a product-moment correlation of .88. Two questions were chosen based on their face validity from the Taylor-Manifest Anxiety Scale (items #66-67 of Appendix D) to assess subjects perceptions of their ability to manage stress.

NEO Personality Scale (Costa and McCrae, 1985). The NEO Personality Inventory consists of 181 items to which subjects respond true or false. The scale attempts to evaluate the five factor model of personality. The five factor commonalities after varimax rotation ranged from .95-.98. The NEO displayed internal consistency and remained stable over a period of 6 years (Costa & McCrae, 1988). Two questions were chosen based on their face validity from the NEO Personality Scale (items #68 and 69 of Appendix D) in order to further assess subjects abilities to manage stressful situations.

Demographics Questionnaire. These questions are related to participants' weight, height, GPA, etcetera (Appendix E Appendix F).

In addition, 15 questions were created specifically to measure changes in behavior and thinking styles based upon the intervention used in this study (e.g. acquisition of nutritional knowledge, changes in eating patterns, etcetera).

These additional questions correspond to items #65 and 70-80 of Appendix D.

Procedure

Two-hundred and three women belonging to four campus sororities at a large southwestern state university participated in the intervention. Members of two sorority houses served as control subjects (n=90) while members of the other two houses served as experimental subjects (n=113) and received an eight week intervention consisting of five workshops involving risk factors associated with the development of anorexia nervosa and bulimia nervosa. Initially, all participants completed the pre-testing questionnaire. Experimental subjects then received five 20-30 minute workshops involving the risk factors during the following six weeks. The control subjects did not receive any workshops during this time period.

Questionnaires were completed and workshops were conducted at each individual sorority house during their weekly sorority meetings. Responses to the questionnaires remained anonymous throughout the study. In order to assure anonymity, each subject was given an identification number which corresponded to a list retained by the sorority. Each questionnaire contained a cover letter which explained the

study, affirmed subject's anonymity, and informed them that completion of the questionnaire provided consent to participate in the study. It was made clear to subjects both in the cover letter and by the examiner that they could refuse to answer any question or questions with which they were uncomfortable.

Workshops were administered by either professionals within the community or psychology students with a particular interest or expertise in the topic. Workshops conducted with the two sororities receiving the intervention were identical, differing only with respect to unique questions that may have been asked by sorority members. The workshops were administered in the same order and conducted by the same examiner. The sororities involved in the control group were offered the workshop series or individual workshops at the conclusion of the study.

In order to maximize the validity of the subjects response, sorority members were not informed of the intervention protocol. Sororities often receive lectures and workshops related to relevant issues in their environment. To eliminate any potential biases, the only members who were informed of the clinical interventions were the sorority president and the member in charge of scheduling. Members had

no advance knowledge of the workshops content until its' introduction. They were kept unaware of any "purpose" to the workshops, their relationship to one another, or that they constituted a study related to disordered eating. Furthermore, subjects were unaware that they would be asked to complete additional questionnaires upon the interventions completion.

The present study's data collection and workshops administration were completed in the following order:

Baseline Testing. The study commenced with the distribution of questionnaires to sorority members at their weekly meetings in order to establish baseline measures. On average, completion of the questionnaires took approximately 30 minutes.

Basic Information on Eating Disorders. The primary presenter utilized slides to present information regarding the definitions of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorders Not Otherwise Specified (Diagnostic Statistical Manual Third Edition Revised (DSM III-R), 1987). The lecture included the medical, dental, and physical consequences of eating disorders, typical assessment and treatment modalities, as well as other factors associated with the development and maintenance of such disorders (e.g. society/media).

Information Regarding Proper Exercise and Fitness. A graduate student with expertise in the area of exercise and fitness presented this lecture.

Subjects were asked to identify the frequency of their physical activity. Based on the subjects responses, information was supplied regarding appropriate frequency and exercise patterns. An examination of the reasons that subjects chose to exercise was then addressed by noting common elements, such as the desire to lose weight and athletic competition. Information on healthy exercise versus excessive exercise was offered. Finally, subjects were given basic educational information regarding a variety of fitness related topics such as average or ideal amounts of body fat, target heart rates during exercise, as well as instruction in finding and determining heart rates.

Stress Management. Workshops were presented by a research assistant who displayed exceptional knowledge and interest in the area of stress management.

Information was presented in a manner relevant for many types of stress with no mention of its application to eating disorders. The aim of the workshop was to provide general guidelines to more effectively deal with stress.

Initially, subjects were asked to identify current

stressful situations and any physical symptoms (e.g. tightness in stomach, headache) that often accompanied these situations. A brief discussion concerning these situations ensued.

Two strategies were then presented to cope with stress. First, subjects were offered a mnemonic (STIRR) that could easily be applied and remembered when dealing with stress:

- 1) **S**ense stress when it first occurs - Subjects were encouraged to be aware of individual signs often associated with the onset of stress (e.g. physical symptoms).
- 2) **T**hink about self-talk - Emphasis was made on the importance of talking oneself through a stressful situation. Suggestions such as telling oneself that they are in control were made.
- 3) **I**nstruction regarding the replacement of negative coping thoughts and feelings - Subjects were encouraged to replace common negative thoughts and feelings related to the stressful event with positive ones, thus, enabling the student to continue coping with the situation as well as increasing the likelihood of a successful outcome.
- 4) **R**elax self actively - Several methods of relaxation such as deep breathing were discussed.
- 5) **R**eward self for having tried to cope - Subjects were offered examples of ways to rewarding oneself once the

stressful situation had ended. In addition, they were encouraged to discuss their survival of the event and that if faced with a similar situation in the future they would again be able to cope successfully.

Secondly, Meichenbaum's stress inoculation techniques (1985) were reviewed. The use of positive self-statements was emphasized. Using positive self-statements, students looked at the four levels of stressful situation: 1) preparing for a stressor, 2) confronting a stressor, 3) being overwhelmed by a stressor, and 4) rewarding oneself for having coped. Finally, subjects were asked to use this method in a current anxiety-provoking situation. Two or three subjects were randomly chosen to sing a song, dance, or give an impromptu speech to the entire group and deal with the anxiety using the stress inoculation techniques. Students were asked to discuss their feelings with the group.

Nutritional Information. A Registered Dietician conducted the workshops on nutritional information.

Subjects were asked their beliefs about the components of a healthy eating plan. They were also queried as to which particular foods would be included and how they would categorize food groups (i.e. "good" foods and "bad" foods). Common myths about nutrition, food, and weight were

then discussed and refuted, giving subjects ample opportunity to ask questions regarding their own ideas about nutrition.

Subjects were educated on proper weight control and the effects of "yo-yo" dieting with emphasis on weight regulation, low calorie diets, lean body mass proportions, and effects on the metabolic rate. Finally, the a food guide pyramid was reviewed and distributed to subjects.

Increasing Self Esteem and Body Image. Workshops were presented by a research assistants who displayed exceptional knowledge and interest in the areas of body image and self esteem.

Body Image. Subjects initially completed the Color-A-Person Test (Wooley, 1986). Each subject was given a picture of an outline of a woman's body and a box of crayons. Based on a color chart, subjects filled in the body parts depicted in the picture with the colors that best exemplified their feelings of their own body image:

<u>COLOR</u>	<u>FEELING</u>
Red	Hate (completely unacceptable)
Yellow	Dislike (somewhat unacceptable)
Green	Ambivalent (don't care, think about)
Purple	Like (acceptable)
Blue	Love (Perfect)

Subjects were then given the opportunity to discuss and share their feeling about the exercise. (e.g. common feeling regarding certain body parts). Subjects were presented the results of a study investigating women's attitudes about the body using the Color-A-Person test. Similarities between the subjects and the women represented in the study were discussed.

Subjects were offered basic information about the development of a woman's body as well as socio-cultural influences contributing toward body image and dissatisfaction. Examples of socio-cultural influences described included the increase in the number of diet articles appearing in women's magazines and the decrease in measurements of Miss America contestants and Playboy centerfold models.

Self Esteem. This workshop followed the one on Body Image and began establishing a relationship between body image and self-esteem. Current socio-cultural influences were discussed to increase subjects' awareness of the powerful messages they receive in our society to feel deficient/inept with a tendency to depend on the approval of others for their self-worth. Society's influences, (e.g. media), including its effect on self-esteem, were then discussed in some detail. A visual aid poster covered with women's magazine titles (e.g.

"How to make your man satisfied"; How to look beautiful in a week,"; How to keep your man from leaving you"), was used to further emphasize the point that society is constantly informing women that they are inadequate.

To increase self-esteem subjects participated in a modified exercise developed by Morris & Shelton, (1974) and elaborated by Katzman et al. (1985). Subjects were handed two envelopes enclosed with stationary. They were asked to open one of the envelopes and list five pleasing qualities about themselves. Subjects were asked to pick a friend and then, open the other envelope. Subjects wrote five qualities that they liked and appreciated about their friend. Subjects sealed the envelope and gave it to the chosen friend. It was suggested to subjects that at times when they were feeling badly, they should refer to their own list of good qualities as well as the list written by their friend.

Conclusion. All subjects were asked for a second time to complete the entire questionnaire as well as supply demographic information (Appendix C, Appendix D, and Appendix E). In addition, those subjects involved in the intervention were asked to offer their comments about the entire intervention process (Appendix F). Finally, subjects were debriefed in the large group format and told the questionnaire

and workshops were part of a study. The overall purpose of the study was also revealed. In addition to writing their comments, subjects were given the opportunity to offer verbal comments and to ask any questions they had regarding the interventions.

RESULTS

The present study attempted to determine the impact of an eight-week intervention program designed to decrease characteristics associated with disordered eating. It was hypothesized that those intervention groups receiving the workshop series would score in a significantly less symptomatic direction on theoretically relevant etiological variables than those not receiving the workshops.

In evaluating the results of the present study, information regarding subjects attendance requires attention. Only those subjects who completed the pre- and post-test questionnaires were included in the analyses. A total of 308 women completed the pre-test. However, only 203 of these women also completed the post-test. In order to determine any differences in the variables measured between the group that completed the pre-test and the post-test ("completers") and the group that only completed the pre-test ("drop-outs"), t-test analyses were performed. Of the 8 variables considered, there was a statistically significant difference on only one of these variables between the two groups. The results indicated that the drop-out subjects had higher scores on the Bulimia sub-scale of the EDI ($t(305) = 3.31, p < .001$) than completers. Attendance was not taken at each workshop, making

it unclear as to whether subjects involved in the analyses were present during each workshop. Additional attention is given to this limitation during the discussion section.

Demographic Data. Among the 203 women participating on the study, minor variations were reported. Subjects ranged from age 18 to 22 years, with an average age of 19.6 ± 1.74 years. The average height for all subjects was $5'6" \pm 2.6$, their average weight was 127 ± 15 pounds, and their average GPA was $3.02 \pm .46$; there was no statistically significant differences between the control and experimental groups on any of these variables based on an ANOVA as illustrated in Table 1a.

Ninety percent of subjects identified themselves as Caucasian, 3% as Native American, 2% as Hispanic, 2% as Asian, 1% as African American, and 1% of some "other" ethnic minority. Forty-six percent of subjects had been a member of a sorority for one year or less, 33% for two years, 19% for three years, and 2% for 4 years. Forty-eight percent of the subjects described themselves growing up in the Southwest of the United States, 29% stated they were from the West, 11% from the Midwest, 5% from the Northwest, 3% stated that they moved around a lot, 1% from the Northeast, and .5% from the Eastern part of the United States. There were no statistically significant differences on any of the variables

between the control and experimental groups based a chi-squared analyses as shown in Table 1b.

Hypothesis Testing. A mixed design Analysis of Variance (ANOVA) was used to determine the effects of the intervention. Between subjects factors in the Anova were group (intervention vs. control) and sorority house membership (nested within group). The repeated measure was time (pre-test or post-test).

The first four hypotheses pertained to four dimensions of the Eating Disorder Inventory.

Hypothesis #1. First, the Drive for Thinness sub-scale, measuring weight preoccupation, was evaluated. It was hypothesized that the score of subject's in the intervention groups would decrease significantly from those in the control group. The ANOVA yielded a non-significant F ratio for the Time x Group interaction ($F(1,199) = 1.74, p = .19$). A non-significant F ratio for the Time x House interaction was produced as well ($F(1,199) = 0.43, p = .65$).

Hypothesis #2. The second hypothesis pertained to subjects dissatisfaction with their body shape. This was measured by the Body Dissatisfaction sub-scale of the EDI. The Body Dissatisfaction sub-scale produced a non-significant F ratio for the Time x Group interaction ($F(1,199) = 0.10, p = .75$). The ANOVA yielded a non-significant F ratio for the

Time x House interaction as well ($F(2,199) = 1.35, p = .26$).

Hypothesis #3. The third hypothesis analyzed subjects feelings of inadequacy as measured by the Ineffectiveness sub-scale of the EDI. The ANOVA yielded a significant F ratio for the Time x Group interaction ($F(1,199) = 6.50, p = .01$). The intervention group had significantly lower scores than the control group on this sub-scale indicating higher levels of self-assurance. Furthermore, the ANOVA yielded a trend toward statistical significance for the Time x House interaction ($F(2,199) = 2.97, p > .10$). The means of control and experimental groups on this sub-scale can be found in Table 2.

Insert Table 2 about here

In order to determine the interaction, post-hoc t-tests were performed on cell means. Based on these analyses, at post-test, the control group had a higher mean rating on the Ineffectiveness sub-scale of the EDI than the experimental group, $t(201) = 3.77, p < .001$.

Hypothesis #4. The fourth hypothesis indicated a significant effect involving the Bulimia sub-scale which addresses an individuals propensity to think about and engage in bingeing. The results produced a significant F ratio for

the Time x Group interaction ($F(1,199)=10.16, p=.002$). Non-significant results were produced for the Time x House interactions ($F(2,199)=.59, p=.56$). Result therefore indicate that the intervention group had significantly lower scores than the control group on this sub-scale as shown in Table 3.

Insert Table 3 about here

In order to determine the interaction, post-hoc t-tests were performed on cell means. Based on these analyses the following pair-wise differences were found to be significant: 1) The experimental group displayed a greater improvement on the Bulimia sub-scale of the EDI than the experimental group, $t(201) = 2.41, p<.05$. 2) At post-test, the control group had a higher mean rating on the Bulimia sub-scale of the EDI than the experimental group, $t(201) = 3.83, p<.001$

Hypothesis #5. The fifth hypothesis proposed that the subjects who participated in the intervention would have an improved self esteem. Analysis of the Rosenberg Self Esteem Scale produced a non-significant F ratio for the Time x Group interaction ($F(1,198)= 1.85, p=.18$). The ANOVA yielded a non-significant F ratio for the Time x House interaction as well ($F(2,198)= 0.01, p=.99$).

Hypothesis #6. The sixth hypothesis proposed that subjects would absorb and retain information offered during the workshops regarding exercise, nutrition, and stress management after completion of the workshop series. This analysis was conducted on questionnaire items associated with each category (e.g. questions related to exercise). Analysis of knowledge regarding exercise yielded a non-significant F ratio for the Time x Group interaction ($F(1,199) = 0.06, p = .80$) and the Time x House interaction ($F(2,199) = 0.03, p = .97$). Analysis of knowledge regarding nutrition yielded a non-significant F ratio for the Time x Group interaction ($F(1,199) = 0.05, p = .82$) and for the Time x House interaction ($F(2,199) = 0.86, p = .43$). Analysis of knowledge regarding stress management yielded a non-significant F ratio for the Time x Group interaction ($F(1,199) = 0.74, p = .39$) and for the Time x House interaction ($F(2,199) = 0.08, p = .92$).

Exploratory Analysis. The Drive for Thinness sub-scale of the Eating Disorders Inventory identifies people with significant eating problems. A cutoff score of 14 on this sub-scale has been shown to define a group of "weight preoccupied" college women (Garner, 1984). Applying this criterion, 11.9% of all the women in this sample were so classified. There was no statistically significant difference between the control and

experimental groups ($\chi^2=.25$), or between individual houses ($\chi^2=.62$) on this measurement. Interestingly, there was no change between pre- and post-testing on this sub-scale indicating no overall change in their "weight preoccupation" among those subjects involved in the intervention and those not involved.

Subjects noted dissatisfaction regarding particular parts of their body and additional eating disordered thoughts and behaviors which can be found in Table 4a and Table 4b.

Insert Table 4a about here

Insert Table 4b about here

In order to determined the inter-correlations of the variables measured, correlation analyses were conducted. The results of this analysis can be found in Table 5.

Insert Table 5 about here

DISCUSSION

The results failed to indicate any significant differences between the control and experimental subjects in four of the main hypotheses. Only in the hypotheses involving subjects scores on the Ineffectiveness and Bulimia sub-scale of the EDI were statistically significant changes observed.

Correlation analysis as shown in Table 5 indicated that strong correlations exist among the various measurement factors. Such correlations would not be surprising as these variable were chosen based on their association with eating disorders. Nevertheless, it is of interest to question the reason why the results indicate a significant difference in only two of these variables.

With respect to the Bulimia sub-scale, it can be argued that although changes in other factors were not in and of themselves significant, the cumulative effect of the changes could produce the significant change in the subjects bulimic behaviors. Another possible explanation is subjects reaction to information received during the workshops. Adverse consequences of bulimic behavior (e.g. bingeing, purging, and laxatives) might have had a greater impact than negative consequences of poor nutrition practices, excessive exercise and stress, poor body image and low self-esteem. Thus, the

improvement of subjects scores on the Bulimia sub-scale might be explained by their knowledge of adverse effects of disordered eating.

In evaluating the results of the Ineffectiveness sub-scale of the EDI, it might appear surprising to find no significant results on the measurement of self-esteem based on the Rosenberg Self-Esteem scale. An examination of the questions comprising these two measures indicate that while the Rosenberg Self-Esteem scale is a global measurement of self-worth, the Ineffectiveness sub-scale deals with an individual's abilities and inadequacies. A persons overall self-esteem can be changed only through slow and methodical ways while feeling of self-efficacy is subject to much faster modification. It is reasonable to conclude that if an individual has feelings of enhanced self efficacy, such an individual would undertake more tasks which if successful, will ultimately results in an enhanced global self-esteem. The interventions administered may have enhanced subjects feelings of self-efficacy in several areas. Therefore, improving their scores on the Ineffectiveness sub-scale. However, repeated accomplishments demonstrating subjects ability to succeed would appear to be necessary to enhance their global self-esteem.

Consideration of the limitations of the current research are helpful in explaining the results as well as providing illumination for the design of future preventative interventions.

Limitations. The first limitation acknowledges that the present study must be considered quasi-experimental. Individual sorority houses were randomly assigned to the control and experimental groups. However, it was not possible to randomly assign individual sorority members to the control and experimental groups. Although the control and experimental groups were presumed to be homogenous and no statistically significant differences were found with respect to any demographic variables (see Table 1a and Table 1b), the potential problems of a quasi-experimental design (Cook and Campbell, 1979) will be discussed.

Selection maturation arises when respondents in one group are more experienced, tired, or bored than respondents in another group. There were no statistically significant differences between the control and experimental groups on any of the pre-test data (See Table 6 and Table 7).

Insert Table 6 about here

Insert Table 7 about here

Furthermore, there is no reason to assume that any difference in maturation rates between the groups in view of the fact that the sorority houses were not involved in any additional events during the intervention process. Therefore it would seem that selection maturation created minimal, if any difficulties, as both groups appeared to be similar on all aspects being assessed.

Local History applies where events other than the treatment affects either the experimental or control group. None of the sorority houses received any additional lectures or workshops from other sources during the intervention, minimizing the occurrence of local history problems. However, both the control and experimental subjects may have been individually exposed to external events affecting the intervention outcome. For example, individuals enrolled in a psychology class may have received additional information on eating disorders. However, there is no reason to assume that there existed any significant differences between the number of control and experimental subjects who may have received

extraneous information.

Resentful Demoralization can develop if the no-treatment group becomes resentful of the fact that they are receiving a less desirable intervention or treatment. Results of the Ineffectiveness and Bulimia sub-scale of the EDI identified that while the experimental group scores improved, the control group scores actually worsened. Therefore, the threat of Resentful Demoralization must be considered. In view of the fact that most sorority women maintain close relationships with members of other sororities, it is likely that experimental subjects could have discussed the workshops with control subjects. Nevertheless, there is no reason to assume that Resentful Demoralization would occur since subjects were not informed that the workshops constituted an intervention and weekly lectures and workshops are a common occurrence within sororities.

The second limitation concerns the matter of subjects attendance at the workshops. Although all weekly sorority meetings are considered 'mandatory', all members do not conform to this requirement. No information exists as to whether particular subjects had been present at each and every workshop. Nevertheless, those subjects who were present for the pre- and the post-testing were included in the analysis

despite the fact that some individual may have missed one or more workshops. The four sororities involved in the present study had 305 active members complete the pre-testing questionnaires. Of those who completed the pre-test, only 203 (68%) completed the post-tests questionnaire. It is possible that the results may have been skewed by the fact that some unknown number of subjects were not exposed to all the subject material.

The fact that only 68% of the women who participated in the pre-testing were also available for post testing must be addressed. Two possibilities for this drop-out rate exist. 1) The fact that drop-out subjects scored significantly higher in the pre-testing on the Bulimia sub-scale of the EDI might suggest selection bias. The possibility exists that these particular individuals were unable to attend the post-test due to potential consequences which directly or indirectly relate to their elevated bulimia scale. 2) The drop-out rate could have been a result of chance with no correlation of selection bias since the women involved were completely unaware they were serving as subjects in a study. The so-called drop-out rate in this study would then be explained by the fact that an absence of sorority members for any number of reasons is relatively common. Given this circumstances, there would be

no reason to assume that the lack of participation by these subjects would in any way jeopardize the results.

Thirdly, the intervention may have been impeded by the requirement that presenters refrain from divulging to subjects the fact that workshops were part of a series designed to inform subjects regarding disordered eating. Thus, the program may have jeopardized a thread of continuity which would have allowed each presenter to refer to other topics and build on them.

The fourth limitation argues that the effectiveness of the intervention could have been substantially improved with a program that entailed more individual sessions. Due to the limitations imposed by the individual sororities, each risk factor was discussed in an individual session limited to 20-30 minutes. The suggested solution would be to conduct more frequent sessions in order to more adequately address each risk factor (e.g. 3-5 workshops per risk factor). For example, subjects noted an association between self-esteem and perceptions of their own physical attributes. Additional workshops might very well aid in developing additional methods to enhance self-esteem.

Additional workshops would also be most useful in allowing subjects periods of reflection, giving them an

opportunity to formulate probative questions. Subjects would benefit from increased rapport between themselves and workshop presenters, which would facilitate discussions of a more personalized nature.

More frequent workshops may also allow for enhanced absorption and retention of the content material. It is recommended that in future programs, subjects be provided with mini-questionnaires to be completed between sessions. By way of example, a questionnaire on stress management would seek to elicit information regarding a subjects typical day. They would be asked to provide information on the number of stressful situations which occurred, the estimated length of each stress period following the event, and their eating patterns during such periods. The information would convey to them the correlation between stress and their eating habits in a way that a typical lecture on stress would find hard to duplicate.

The fifth limitation identifies that the study's effectiveness may have been limited by the fact that the particular risk factors selected may not have been the most appropriate for use in a large group intervention. The risk factors that were chosen were selected from those described in the literature using the following criteria: 1) factors which

studies indicate were correlated with eating disorders; and 2) factors which could most easily be dealt with in large group presentations.

It is suggested that in future studies, in addition to a control group, experimental subjects be divided into separate groups to confirm appropriateness of the risk factors. Each group would receive an intervention program involving different risk factors. The results could indicate greater effectiveness of the use of one group of risk factors than another group. For example, it has been established that eating disorders occur predominantly among women, making gender a risk factor. A workshop devoted to the topic of gender roles might be offered in one series of interventions but not in another.

The final limitation involves the question of the effectiveness of the intervention techniques used in the present study. The techniques that were used were those suggested in the literature, although it must be acknowledged that few outcome studies showing their short or long term effectiveness in group interventions have been reported. Such techniques, as were found, focused on modification of certain behaviors or attitudes but were not used in conjunction with an evaluation of disordered eating. In order to evaluate the

effectiveness of various techniques, subjects should be divided into groups. For example, subjects should be divided into small groups which could facilitate intimate discussion, encourage interaction among members, and address more personal issues.

Cunningham, Davis, Bremner, Dunn, and Rzasa (1993) demonstrated the positive effects of such an approach. They evaluated Coping Modeling Problem Solving (CMPS), where subjects were encouraged to interact and formulate their own solution to presented problems as compared to Mastery Modeling (MM) where subjects received didactic information. Subjects in the CMPS group displayed less resistance towards the intervention and rated the program more positively when compared to subjects in the MM training group. Comments made by subjects in the present study also support this recommendation. The subjects affirmed that they preferred having more interaction with typical comments being: "It works well when we can ask questions", and finding it helpful to have the opportunity to meet with a "nutritionist one on one".

Benefits. Six main hypotheses were proposed for the present study, only two of which were statistically significant. The first of these hypothesis, proposed that experimental subjects scores on the Ineffectiveness sub-scale of the EDI would

decrease. This positive result indicates that experimental subjects displayed increased levels of self-assurance as compared to control subjects. Thus, it may be concluded that the intervention was successful in imparting knowledge and information which enhanced subjects perception of their own effectiveness or capability. While this perception does not necessarily affect an immediate behavioral modification, it is suggested that such a change in perception might be a contributing factor in future changes in their behavior patterns. Principles of self-efficacy support such interpretations.

Efficacy expectancies are an individual's beliefs about their own ability to engage in behaviors which will lead to a desired outcome or avoid an undesired one. The ability to envision a positive outcome, set goals, and plan courses of action, are significantly enhanced by the individuals perceived self-efficacy. Bandura (1989) has noted that all psychological interventions manifest change by modifying perceptions of efficacy. Therefore, an enhanced perception of effectiveness may have resulted from the programs attempt to impart an understanding of the unrealistic expectation of the superwoman ideal imposed by society.

The second hypothesis indicated a statistically

significant change involved the Bulimia sub-scale of the EDI. Experimental subjects displayed a pronounced decrease in their proclivity to think about and engage in bingeing and vomiting. The intervention content that may have had an influence on this favorable result included the following:

- 1) A better understanding of the harmful medical consequences of bingeing and vomiting.
- 2) Information regarding the alternative use of exercise as a more appropriate method of weight reduction.
- 3) Information regarding methods of stress reduction.
- 4) Information concerning nutrition which allowed subjects to consider modifying their eating patterns as an appropriate method for weight reduction.

This result may have significant impact on future studies involving disordered eating populations. The modification of behavior in this regard could discourage more destructive behavior patterns with respect to eating disorders. The Relapse Prevention model (Marlatt, 1988) emphasizes the concept of altering behavior patterns when exposed to potentially high risk situations. Relapse Prevention encourages individuals to identify and cope with such situations that may precipitate the onset of undesirable behaviors. Therefore, in the future, if subjects are exposed

to events which might have precipitated eating disorder symptomatology in the past, the subject may be less likely to revert to the prior disordered eating patterns.

In conjunction with the above noted statistically significant results, several additional benefits were derived from the study.

Disordered eating patterns take one of several different courses: 1) they may progress to a *clinical* eating disorder; 2) they may worsen, yet still remain in the realm of a *sub-clinical* disorder; 3) they may maintain a state of equilibrium; or 4) they may improve and no longer be considered a problem. It is currently impossible to determine which of these four categories any individual with disordered eating patterns will fall under.

Twice as many individuals suffer from a sub-clinical eating disorder as those who have been clinically diagnosed (Shisslak, Crago, & Estes, in press). Most likely, a substantial, but unknown number, of subjects participating in the present study suffered from a sub-clinical eating disorder. As is the case with most people suffering from a sub-clinical eating disorder, these women typically will not seek treatment. Thus, only through community interventions similar to the present study, can these individuals have any

hope of gaining greater control over abnormal eating patterns. Moreover, improved preventive interventions may serve as an early form of treatment. Despite the fact that a disordered eating pattern may not be deemed *clinical* and may never fall into that classification, the endeavor to identify and treat such individuals seems most worthwhile.

The present study indicated that approximately 12% of sorority women are extremely weight pre-occupied and may suffer from significant eating disturbances. This score is similar to that found by Nebel (1992), and further emphasizes the fact that sorority women continue to be at higher risk than the general college population for the development of disordered eating.

Finally, current managed health care proposals are focusing ever more on prevention and group treatment techniques. Among individuals with clinical and sub-clinical eating disorders, serious health related problems (i.e. medical and dental) can develop. Medical and dental complication can be extensive and costly for insurance companies. If these interventions can be proven effective, health insurers may provide monetary support for such workshops.

Conclusion

The literature is devoid of examples of prevention techniques designed to affect disordered eating among non-clinical young-adult populations. The present study demonstrated that a non-clinical young-adult population, highly susceptible to disordered eating, would consent and be amenable to an intervention procedure over the course of several months. The participants displayed a high level of concern and acknowledged the common occurrence of eating disorders among their peer group. Moreover, large scale interventions appear to be one of the few practical ways of dealing with the growing problem of disordered eating before the onset of the acute stage.

Two major findings resulted from the present study. First, subjects involved in the intervention displayed increased levels of self-assurance. Principles of self-efficacy clearly demonstrate that an individual's confidence in their abilities to control situations affecting their lives determines their motivation, feelings, and behaviors. (Bandura, 1989). Although, it is presumptuous to assume that this finding will result in the prevention of disordered eating, improved self-efficacy may significantly contribute to such behavioral modification.

The second major finding of the present study demonstrated that subjects in the experimental group displayed a significant decrease in their tendency to focus on and engage in binge eating. Irregular episodes of binge eating often occur at the onset of an eating disorder. If such episodes can be curtailed, the prospect of the development of a clinical eating disorder would appear to be substantially reduced.

While the results of the present study affirmed two primary hypotheses, it is difficult to clearly identify the reasons that the others were not substantiated. The four hypotheses which did not produce significant results, leads one to question the reason for lack of confirmation. It can be speculated that either a large scale intervention was ineffective to significantly effect subjects' attitudes, or, the particular content of the program lacked substantial efficacy to yield the anticipated results.

While it is hoped that the positive findings in connection with the Bulimia and Ineffectiveness sub-scales of the EDI would foretell a change of perception which could lead to behavioral modifications, it must be recognized that subjects may have felt compelled to respond in a manner that they deemed would conform to the expected answer as opposed to

reflecting an actual change in attitudes. Nevertheless, the results which did prove significant are meaningful in this step toward the prevention of disordered eating.

Since the present study is a tentative step in evaluating the effectiveness of a large scale preventative intervention for young adult women, additional research would be most productive. Future studies need to evaluate the effectiveness of particular aspects of the present study. If effectiveness can be improved, the probability that such large-scale interventions would be able to combat eating disorders is likely enhanced. Longitudinal studies are necessary to confirm whether behavior patterns can be permanently altered by such interventions.

It seems appropriate that a first step involving a large group preventive intervention should involve sorority women. Sorority women have been noted as an 'at risk' population for the development of disordered eating (Shisslak & Crago, 1992). Furthermore, this population, when compared to other college populations, has been identified as having an increased incidence of disordered eating patterns (Nebel, 1992). It seems natural that this group of women, as well as other 'at-risk' populations (e.g. gymnasts, ballet dancers), be the focus of intervention techniques. Intervention programs, as

described in the present study, may prove to be an effective means to address a malady affecting many young women today.

Hopefully, the suggestions noted above will prove to be aid in creating a comprehensive protocol to address the complex issues surrounding the development of eating disorders, particularly among high risk groups. Eating disorders pose an extremely dangerous medical situation with the highest fatality rate amongst all psychiatric illnesses. Preventive intervention toward these disorders should therefore be considered a fruitful area for future study.

APPENDIX A

DSM-IV Criteria for Anorexia Nervosa

- A. Refusal to maintain body weight at or above a minimally normal weight for age and height,
- B. Intense fear of gaining weight or becoming fat, even though underweight.
- C. Disturbance in the way in which one's body weight or shape is experienced; undue influence of body weight or shape on self-evaluation, or denial of the seriousness of the current low weight.
- D. In post-menarcheal females, amenorrhea, i.e. the absence of at least three consecutive menstrual cycles

Specify Type:

Restricting type: During the episode of Anorexia Nervosa, the person does not regularly engage in binge eating or purging behavior

Binge Eating/Purging type: During the episode of Anorexia Nervosa, the person regularly engages in binge eating or purging behavior

APPENDIX B

DSM-IV Criteria for Bulimia Nervosa

A. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:

1) eating, in a discrete period of time an amount of food that is definitely greater than most people would eat during a similar period of time and under similar circumstances.

2) a sense of lack of control over eating during the episode.

B. Recurrent inappropriate compensatory behavior in order to prevent weight gain, such as self-induced vomiting; misuse of laxatives, diuretics or other medications; fasting, or excessive exercise.

C. The binge eating and inappropriate compensatory behaviors both occur, on average, at least twice a week for three months.

D. Self-evaluation is unduly influenced by body shape and weight.

E. The disturbance does not occur exclusively during episodes of Anorexia Nervosa.

Specify type:

Purging type: The person regularly engages in self-induced vomiting or the misuse of laxatives or diuretics.

Nonpurging type: The person uses other inappropriate compensatory behaviors such as fasting or excessive exercise, but does not regularly engage in self-induced vomiting or the misuse of laxatives, diuretics, or enemas.

APPENDIX C: QUESTIONNAIRE ITEMS 1-64

The following items ask about your attitudes, feelings, and behavior. Some of the items relate to food or eating. Other items ask about your feelings about yourself.

For each of the following 64 items, please decide if the item is true about you ALWAYS (A), USUALLY (U), OFTEN (O), SOMETIMES (S), RARELY (R), or NEVER (N). Circle the letter (A,U,O,S,R or N) on the **YELLOW ANSWER SHEET** that corresponds to your rating. For example, if your rating for an item is OFTEN, you would circle the O on the **YELLOW ANSWER SHEET**.

1. I eat sweet and carbohydrates without feeling nervous.
2. I think my stomach is too big.
3. I wish that I could return to the security of my childhood.
4. I eat when I'm upset.
5. I stuff myself with food.
6. I wish that I could be younger.
7. I think about dieting.
8. I get frightened when my feelings are too strong.
9. I think that my thighs are too large.
10. I feel ineffective as a person.
11. I feel extremely guilty about overeating.
12. I think my stomach is just the right size.
13. Only outstanding performance is good enough in my family.
14. The happiest time in life is when you are a child.
15. I am open about my feelings.
16. I am terrified of gaining weight.
17. I trust others.
18. I feel alone in the world.
19. I feel satisfied with the shape of my body.
20. I feel generally in control of things in my life.
21. I get confused about what emotion I am feeling.
22. I would rather be an adult than a child.
23. I can communicate with others easily.
24. I wish I were someone else.
25. I exaggerate or magnify the importance of my weight.
26. I can clearly identify what emotion I am feeling.
27. I feel inadequate.
28. I have gone on binges where I felt that I could not stop.
29. As a child I tried very hard to avoid disappointing my parents and teachers.

30. I have close relationships.
31. I like the shape of my buttocks.
32. I am preoccupied with the desire to be thinner.
33. I don't know what's going on inside of me.
34. I have trouble expressing my emotions to others.
35. The demands of adulthood are too great.
36. I hate being less than best at things.
37. I feel secure about myself.
38. I think about bingeing (overeating).
39. I feel happy that I am not a child anymore.
40. I get confused as to whether or not I am hungry.
41. I have a low opinion of myself.
42. I feel that I can achieve my standards.
43. My parents have expected excellence of me.
44. I worry that my feelings will get out of control.
45. I think my hips are too big.
46. I eat moderately in front of others and stuff myself when they're gone.
47. I feel bloated after eating a normal meal.
48. I feel that people are happiest when they are children.
49. If I gain a pound, I worry that I will keep gaining.
50. I feel that I am a worthwhile person.
51. When I am upset, I don't know if I am sad, frightened, or angry
52. I feel that I must do things perfectly or not do them at all.
53. I have the thought of trying to vomit in order to lose weight.
54. I need to keep people at a certain distance (feel uncomfortable if someone tries to get too close).
55. I think that my thighs are just the right size.
56. I feel empty inside (emotionally).
57. I can talk about personal thoughts or feelings.
58. The best years of your life are when you become an adult.
59. I think my buttocks are too large.
60. I have feelings I can't quite identify.
61. I eat or drink in secrecy.
62. I think my hips are just the right size.
63. I have extremely high goals.
64. When I am upset, I worry that I will start eating.

APPENDIX D: QUESTIONNAIRE ITEMS 65-94

The following statements may or may not describe your feelings. Read each statements and the mark the appropriate letter on the PINK answer sheet to indicate how well the statement describes your feelings. There are no right or wrong answer. Do not spend too much time on any one item, but give the answers which seem to describe how you *generally* feel.

65. I feel unable to manage stressful situations.
a. Strongly agree
b. Agree
c. Disagree
d. Strongly disagree
66. Frequently, I find myself worrying about something.
a. Strongly agree
b. Agree
c. Disagree
d. Strongly disagree
67. I work under a great deal of tension.
a. Strongly agree
b. Agree
c. Disagree
d. Strongly disagree
68. I feel I am capable of coping with most of my problems.
a. Strongly agree
b. Agree
c. Disagree
d. Strongly disagree
69. I often worry about things that might go wrong.
a. Strongly agree
b. Agree
c. Disagree
1. d. Strongly disagree
70. How often do you skip breakfast?
a. Every day
b. Sometimes skip breakfast
c. Usually eat breakfast
d. Never skip breakfast

79. I am aware of a healthy amount of exercise necessary to maintain my weight.
- a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
80. When I exercise I usually spend ____ hours doing it.
- a. <1
 - b. 1.0-1.5
 - c. 1.5-2.0
 - d. 2.0-2.5
 - e. >2.5
81. On the whole, I am satisfied with myself.
- a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
82. At times I think I am no good at all.
- a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
83. I feel that I have a number of good qualities.
- a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
84. I am able to do things as well as most other people.
- a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
85. I feel I do not have much to be proud of.
- a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree

86. I certainly feel useless at times.
- a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
87. I feel that I am a person of worth, at least on an equal plane with others.
- a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
88. I wish I could have more respect for myself.
- a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
89. All in all, I am inclined to feel that I am a failure.
- a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
90. I take a positive attitude toward myself.
- a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree

APPENDIX E: DEMOGRAPHIC INFORMATION FOR CONTROL GROUPS

Please fill in the following blanks

1. Age _____
2. Sorority member for _____ years.
3. Cumulative GPA _____
4. Current height _____
5. Current Weight _____
6. I would describe myself to be:
 - a) Native American
 - b) Asian
 - c) Hispanic
 - d) African American
 - e) Caucasian
 - f) Other _____
7. I spent most of my life in this major region of the U.S.
 - a) North
 - b) Northeast
 - c) Northwest
 - d) East
 - e) South
 - f) Southeast
 - g) Southwest
 - h) West
 - i) Midwest
 - j) Alaska
 - k) Moved around a lot
 - l) Hawaii
 - m) Other U.S. territory
8. Would you be willing to be a participant in a follow-up study sometime next semester? (if yes, please leave your name on the envelope) _____

APPENDIX F: DEMOGRAPHIC INFORMATION FOR EXPERIMENTAL GROUPS

Please fill in the following blanks

1. Age _____
2. Sorority member for _____ years.
3. Cumulative GPA _____
4. Current height _____
5. Current Weight _____
6. I would describe myself to be:
 - a) Native American
 - b) Asian
 - c) Hispanic
 - d) African American
 - e) Caucasian
 - f) Other _____
7. I spent most of my life in this major region of the U.S.
 - a) North
 - b) Northeast
 - c) Northwest
 - d) East
 - e) South
 - f) Southeast
 - g) Southwest
 - h) West
 - i) Midwest
 - j) Alaska
 - k) Moved around a lot
 - l) Hawaii
 - m) Other U.S. territory
8. Would you be willing to be a participant in a follow-up study sometime next semester? (if yes, please write your name on the envelope) _____
9. Any comments you have regarding the speakers/workshops you have attended over the past eight weeks would be **very much appreciated.**
 - a. Eating Disorders
 - b. Exercise
 - c. Stress Management
 - d. Nutrition
 - e. Body Image
 - f. Self Esteem

Table 1a

Comparison of Control and Experimental Groups on the Basis
of an ANOVA of Subjects Height, Weight, Age, and GPA

<u>Variable</u>	<u>df</u>	<u>F</u>	<u>p</u>
Height	1,180	0.24	.62
Weight	1,175	2.63	.11
Age	1,183	0.62	.43
GPA	1,172	1.26	.26

Table 1b

Comparison of Control and Experimental Groups on the Basis
of a Chi-Squared Analysis of Subjects Ethnicity, Year in
Sorority, and Place of Origin

Variable	Chi-Squared Analysis
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Ethnicity	$\chi^2(5) = 6.76$ $p = .24$
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Year in Sorority	$\chi^2(3) = 1.75$ $p = .63$
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Place of Origin	$\chi^2(7) = 6.63$ $p = .47$
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TABLE 2

Means of Control and Experimental Groups Regarding the
INEFFECTIVENESS Sub-Scale of the Eating Disorders Inventory

GROUP	PRE-TESTING MEAN(SD)	POST-TESTING MEAN (SD)
CONTROL	2.22 (3.69)	2.84 (4.97)
INTERVENTION	2.01 (3.85)	1.42 (2.70)

Table 3

Means of Control and Experimental Groups Regarding the
BULIMIA Sub-Scale of the Eating Disorders Inventory

GROUP	PRE-TESTING MEAN(SD)	POST-TESTING MEAN (SD)
CONTROL	1.68 (2.85)	2.21 (3.68)
INTERVENTION	1.81 (3.12)	1.23 (2.65)

TABLE 4a

Percentage of All Subjects Responding Always, Usually, or Often to Dissatisfaction of their Body Weight and Shape

ITEM	PRE-TEST %	POST-TEST%
1. I think my stomach is too large	56.2%	58.9%
2. I think my thighs are too large	63.9%	61.5%
3. I feel satisfied with the shape my body	28.1%	33.3%
4. I think my hips are too big	50.5%	55.9%
5. I think my buttocks are too large	43.8%	49.5%
6. I am preoccupied with the desire to be thinner	44.3%	41.9%

Table 4b

Percentage of All Subjects Responding Always, Usually, or Often to Symptoms Characteristic of an Eating Disorder

ITEM	PRE-TEST %	POST-TEST %
1. I eat when I'm upset.	29.2%	28.6%
2. I stuff myself with food.	18.8%	15.3%
3. I think about dieting.	66.3%	58.1%
4. I am terrified of gaining weight.	64.5%	54.2%
5. I have gone on binges where I felt I could not stop.	9.4%	9.4%
6. I think about bingeing.	16.3%	15.3%
7. I eat moderately in front of others and stuff myself when they are gone	6.4%	5.4%
8. I have tried to vomit in order to lose weight.	9.9%	12.4%
9. I eat or drink in secrecy	7.9%	9.4%
10. % of subjects reporting weight management as the #1 reason for exercising	42.0%	39.3%

Table 5

CORRELATION ANALYSIS OF THE VARIABLES MEASURED ACROSS GROUPS

	<u>DT</u>	<u>BU</u>	<u>INEF</u>	<u>BD</u>	<u>ST</u>	<u>NUT</u>	<u>EX</u>	<u>SE</u>
<u>DT</u>	1.0	** .54	** .39	** .71	** .38	* .17	** .44	** .41
<u>BU</u>	** .54	1.0	** .49	** .46	** .39	.07	** .30	** .42
<u>INEF</u>	** .39	** .49	1.0	** .35	** .42	.02	* .17	** .64
<u>BD</u>	** .71	** .46	** .35	1.0	** .35	** .30	** .41	** .45
<u>ST</u>	** .38	** .39	** .42	** .35	1.0	.06	* .16	** .53
<u>NUT</u>	* .17	.07	.02	** .30	.06	1.0	.12	* .16
<u>EX</u>	** .44	** .30	* .17	** .41	* .16	.12	1.0	* .22
<u>SE</u>	** .41	** .42	** .64	** .45	** .53	** .16	* .22	1.0

* p<.05 DT=Drive for Thinness BD=Body Dissatisfaction EX=Exercise
 ** p<.01 BU=Bulimia ST= Stress SE=Self Esteem
 INEF=Ineffectiveness NUT=Nutrition

Table 6
Statistical Significance Between the Control and
Experimental Groups on the Basis of an ANOVA of the Eating
Disorder Inventory Sub-Scales During Pre-Testing

<u>EDI Sub-Scale</u>	<u>df</u>	<u>F</u>	<u>p</u>
Drive for Thinness	1,201	1.02	.31
Bulimia	1,201	.10	.75
Body Dissatisfaction	1,201	.52	.47
Interpersonal Distrust	1,201	.57	.45
Perfectionism	1,201	1.50	.22
Maturity Fears	1,201	1.84	.28
Ineffectiveness	1,201	.15	.69
Interoceptive Awareness	1,201	.16	.69

Table 7

Statistical Significance Between the Control and
Experimental Groups on the Basis of an ANOVA of Measured
Variables during Pre-Testing

<u>Variable</u>	<u>df</u>	<u>F</u>	<u>p</u>
Rosenberg Self-Esteem Scale	1,201	.10	.75
Exercise Information	1,201	1.05	.31
Stress	1,201	.03	.87
Nutrition	1,201	.00	.99

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