A Preliminary Controlled Evaluation of an Eating Disturbance Psychoeducational Intervention for College Students

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Abstract: Objective: Because conventional preventive interventions have had little success in reducing eating pathology, we developed and evaluated a more intensive psychoeducational intervention. Method: Female college students who underwent this intervention and a matched control sample of students (N = 66) completed pretest and posttest surveys. Results: Intervention participants showed significant decreases in thin-ideal internalization, body dissatisfaction, dieting, eating disorder symptoms, and weight over the 4-month study period, whereas matched control participants did not show changes in these outcomes with the exception that they gained weight. Discussion: These preliminary findings suggest that this intervention may prove useful in reducing eating disturbances and overweight among college students, as well as the risk factors for this serious mental and physical health problem. © 2002 by Wiley Periodicals, Inc. Int J Eat Disord 31: 159—171, 2002; DOI. 10.1002/eat.10018

Key words: prevention; eating pathology; overweight

INTRODUCTION

Eating disorders are one of the most common psychiatric problems faced by females, are often chronic, are associated with comorbidity and psychosocial impairment, can result in serious medical complications, and have the highest mortality rate of any psychiatric disorder (Fairburn et al., 1995; Wilson, Heffernan, & Black, 1996). Additionally, eating disorders have the highest levels of treatment seeking, inpatient hospitalization, and suicide attempts of common psychiatric conditions (Newman et al., 1996). Obesity is also extremely prevalent (Troiano, Flegal, Kuczmarski, Campbell, & Johnson, 1995) and results in elevated morbidity and mortality rates, as well as psychosocial impairment (Dietz, 1998; Must, Jacques, Dallal, Bajema, & Dietz, 1992). However, because most people with eating disorders and obesity never seek treatment and current interventions have circumscribed or transient effects (Brownell & Wadden, 1992; Foster, Wadden, Kendall,
much attention has been directed at preventing these adverse outcomes.

Unfortunately, these eating disorder prevention programs have met with limited success (Story, 1999; Striegel-Moore & Steiner-Adair, 1998). Most interventions evaluated in controlled trials have not reduced eating disorder symptoms or overweight (Killen et al., 1993; Mann et al., 1997; Neumark-Sztainer, Butler, & Palti, 1995; Paxton, 1993; Smolak, Levine, & Schermer, 1998), although some reduced risk factors for eating pathology (Franko, 1998; Kaminski & McNamara, 1996; Santonastoso et al., 1999; Winzelberg et al., 2000). Similarly, interventions solely focusing on preventing weight gain have met with little success (Jeffery, 1995; Story, 1999). To our knowledge, only one intervention has been found to produce significant decreases in eating pathology in controlled trials (Stice, Chase, Stormer, & Appel, 2001; Stice, Mazotti, Weibel, & Agras, 2000).

One possible explanation for the limited success of prevention programs is that these interventions may not have been of sufficient intensity. Most programs have involved a small number of sessions, with a mode of a single meeting. Within these short time spans, these programs typically have covered a large amount of psychoeducational information about eating disorders, the consequences of these behaviors, suspected risk factors for eating pathology, nutrition, and healthy weight control techniques. It seems possible that a psychoeducational intervention of longer duration might yield more pronounced effects because participants would have more of an opportunity to discuss, synthesize, and act upon the material.

Because the length of prevention programs is often limited by the amount of class time middle and high school administrations can devote to such interventions, these schools might not be the optimal setting for prevention efforts. An alternative vehicle for examining a more extended psychoeducational intervention is to create a course on eating disorders for a college population, as this would permit a more in-depth presentation of the material. Moreover, research has documented that eating disturbances are ubiquitous among college women (Mann et al., 1997; Mintz & Betz, 1988), suggesting the need for a college-level intervention. An uncontrolled trial of such a psychoeducational intervention yielded promising results, with participants reporting significant decreases in body dissatisfaction and bulimic symptoms (Springer, Winzelberg, Perkins, & Taylor, 1999). Accordingly, the purpose of the current investigation was to provide a controlled evaluation of this type of intensive psychoeducational intervention.

Presumably, an intervention would be optimally effective if it were based on an etiologic model that has been supported by prospective risk factor research. The psychoeducational intervention that we developed included a focus on the risk factors identified in the dual pathway model of eating pathology (Stice & Agras, 1998). This etiologic model proposes that the sociocultural pressure to be thin from family, peers, and media, as well as internalization of the current thin-ideal for women, promotes body dissatisfaction, which gives rise to dieting and contributes to negative affect. Elevated dieting and negative affect, in turn, are believed to increase the risk for onset of binge eating and eating pathology. There is considerable evidence that these factors predict future increases in eating pathology (Killen et al., 1994; Patton, 1988; Stice, 2001; Stice & Agras, 1998; Stice, Killen, Hayward, & Taylor, 1998). Factors in the dual pathway model also have been found to predict growth in body mass and onset of obesity (Stice, Cameron, Killen, Hayward, & Taylor, 1999). Thus, a focus on these factors may also help to promote the healthy weight control behaviors discussed in the intervention (e.g., regular exercise) and result in reduced overweight.
In sum, one possible explanation for the limited success of past eating disorder prevention efforts is that they were not of sufficient intensity. Based on the promising findings of Springer et al. (1999), we developed an intensive psychoeducational intervention and evaluated it in a controlled trial. This intervention provided psychoeducational information about eating disorders, the consequences of these behaviors, suspected risk factors for eating pathology, nutrition, and healthy weight control techniques. A unique aim of this intervention is that it sought to reduce simultaneously eating pathology and obesity, as both outcomes share risk factors and have significant health and mental health consequences. Following from the dual pathway model, it was hypothesized that intervention participants would experience significant reductions in thin-ideal internalization, body dissatisfaction, dieting, negative affect, eating disorder symptoms, fat consumption, and body mass, whereas control participants would not show changes in these outcomes during the same time period.

METHODS

Participants

Eligible participants were 88 female undergraduates who enrolled in a class entitled “Eating Disorders” ($n = 17$) or other upper-division seminars offered concurrently in the psychology department at the University of Texas ($n = 71$). The modal age of participants was 21 (range 17–55). Because eating pathology is rare among males, analyses included only data from the female students (but it might be noted that there were males in all classes). The sample comprised 13% Asians/Pacific Islanders, 2% Blacks, 15% Hispanics, 68% Caucasians, and 2% who specified “other.” Most students were in their junior year (64%), 4% were sophomores, and 32% were seniors.

Procedures

The study was described to potential participants as an evaluation of the effects of a class on students’ attitudes and behaviors. Students in the eating disorder class were asked to complete a pretest and posttest survey to help the instructor gain a more complete understanding of the effects of the class and to provide guidance for how to improve the next iteration of the course. All students volunteered to complete the surveys. Students in three other upper-division psychology seminars were approached and asked to complete parallel pretest and posttest surveys to help us evaluate the effects of another course. Approximately 80% agreed to complete the surveys. We recruited students from other upper-division classes for our matched comparison group in an effort to control for the amount of time spent in a seminar and contact with other students and an instructor. Participants completed the 30-min pretest survey on the first day of classes and an identical posttest survey on the final day of classes 4 months later. Participants were tracked with a confidential identification code to ensure anonymity. All participants gave voluntary written informed consent to participate in this study. Raffles were held for $15 gift certificates to a local music store to compensate students for completing the surveys at both pretest and posttest assessments.
Intervention

The intervention consisted of an advanced undergraduate seminar on eating disorders that met twice weekly for 1.5 hr each session over the 15-week semester. Class meetings primarily involved didactic presentations and group discussions. There was also one guest presentation from a local expert. The course focused on descriptive pathology, epidemiology, etiologic models, empirically documented risk factors, preventive interventions, and treatments for eating disorders and obesity. An overview of the main topics and corresponding educational format is presented in Table 1. Students were required to do a 20–30-min class presentation that represented a critical synthesis of a topic of their choice at the end of the course and to write a 10-page paper on the same subject. They were also required to complete three written essay exams over the course of the semester.

Measures

Thin-Ideal Internalization

Internalization of the thin-ideal was assessed with the Ideal-Body Stereotype Scale-Revised (IBSS-R; Stice & Agras, 1998). This scale asks participants to indicate their level of agreement with statements concerning what attractive women look like (e.g., “Slender women are more attractive”) using a 5-point response format ranging from 1 = strongly disagree to 5 = strongly agree. Items were summed for analyses and scores ranged from 8 to 40. Research has suggested that this scale possessed acceptable internal consistency (α = .91) and convergent and predictive validity (Stice & Agras, 1998). A pilot study (N = 50) produced a 2-week test-retest coefficient of .80 (Stice et al., 2001). This scale had a Cronbach’s alpha of .80 at pretest.

Table 1. Main topics of the intervention and corresponding educational format

<table>
<thead>
<tr>
<th>Main Topics</th>
<th>Educational Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive pathology of anorexia nervosa, bulimia nervosa, binge eating disorder, and obesity, including case examples of each disorder</td>
<td>Didactic presentation and group discussion</td>
</tr>
<tr>
<td>Epidemiology of eating disorders, body image disorder, and obesity, with a focus on the etiologic implications of demographic effects</td>
<td>Didactic presentation</td>
</tr>
<tr>
<td>Sociocultural explanation for body image and eating disorders, with a focus on culture, media, and gender roles</td>
<td>Didactic presentation and group discussion</td>
</tr>
<tr>
<td>Risk factors: Sociocultural pressures from mass media, family, and peers, thin-ideal internalization, body dissatisfaction, dieting, depression, and negative affect</td>
<td>Didactic presentation and group discussion</td>
</tr>
<tr>
<td>Multivariate etiologic models for eating disorders, including both theory and empirical tests</td>
<td>Didactic presentation and group discussion</td>
</tr>
<tr>
<td>Obesity and the unbalanced energy equation</td>
<td>Didactic presentation</td>
</tr>
<tr>
<td>Risk factors for obesity: consumption, exercise, and dieting Prevention of body image disturbances, eating disorders, and obesity</td>
<td>Didactic presentation and group discussion</td>
</tr>
<tr>
<td>Treatment for body dysmorphic disorder, anorexia nervosa, bulimia nervosa, binge eating disorder, and obesity</td>
<td>Didactic presentation and guest presentation</td>
</tr>
</tbody>
</table>
Body Dissatisfaction

Body dissatisfaction was assessed with an adapted form of the Satisfaction and Dissatisfaction with Body Parts Scale (Berscheid, Walster, & Bohnstedt, 1973). This scale asks participants to indicate their level of satisfaction with nine body parts on 5-point scales ranging from extremely satisfied to extremely dissatisfied. Items were summed for analyses and scores ranged from 9 to 45. This scale had acceptable internal consistency ($\alpha = .94$), 3-week test-retest reliability ($r = .90$), and convergent and predictive validity in prior research (Stice & Agras, 1998). This scale had a Cronbach’s alpha of .92 at pretest.

Dieting

The Dutch Restrained Eating Scale (DRES; van Strien, Frijters, Van Staveren, Defares, & Deurenberg, 1986) was used to assess dieting. Participants indicate the frequency of dieting behaviors using 5-point scales ranging from never to always. Items were summed for analyses and scores ranged from 10 to 50. Research has documented the internal consistency ($\alpha = .95$) and criterion validity of this scale, including the fact that it correlates with actual caloric intake (van Strien et al., 1986; Wardle & Beales, 1987). A pilot study ($N = 50$) produced a 2-week test-retest coefficient of .82 (Stice, 2001). This scale had a Cronbach’s alpha of .93 at pretest.

Depressive Symptoms

The Beck Depression Inventory (BDI-II; Beck, Steer, & Garbin, 1988) was used to measure depressive symptoms. This self-report questionnaire assesses the somatic, affective, cognitive, and behavioral symptoms of depression. Items were summed for analyses and scores ranged from 0 to 42. It has been found to have acceptable internal consistency ($\alpha = .73$–.95), reliability (test-retest coefficients range from .60 to .90), and convergent validity with clinician ratings of depressive symptoms ($M r = .75$; Beck et al., 1988). This scale had a Cronbach’s alpha of .90 at pretest.

Eating Pathology

The diagnostic symptoms of anorexia nervosa, bulimia nervosa, and binge eating disorder were assessed with the Eating Disorder Diagnostic Scale (EDDS; Stice, Telch, & Rizvi, 2000). The EDDS is a 22-item self-report questionnaire derived from validated structured interviews for assessing eating disorders. Items were summed to form an overall eating disorder symptom composite (except items assessing height, weight, and birth control pill use) and scores ranged from 0 to 112. EDDS responses were used to generate threshold and subthreshold diagnoses of current anorexia nervosa, bulimia nervosa, and binge eating disorder as outlined in the 4th ed. of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994). Subthreshold diagnoses required the presence of all of the symptoms of the disorder, but that at least one of these symptoms was of subdiagnostic severity (e.g., binge eating only once per week). It should be noted that such subthreshold diagnoses would be considered an eating disorder not otherwise specified (EDNOS) according to DSM-IV. Because of the small sample size, participants were classified simply as meeting diagnostic criteria for a threshold or subthreshold eating disorder or not. The EDDS has
shown high agreement (mean kappa = .83) with the Eating Disorder Examination (EDE; Fairburn & Cooper, 1993), the current gold standard for diagnosing eating disorders. It has been shown to have strong internal consistency (α = .89) and 1-week test-retest reliability (r = .87; Stice, Telch, et al., 2000). The eating disorder symptom composite had a Cronbach’s alpha of .82 at pretest.

**Fat Consumption**

Consumption of common high-fat foods was assessed with an adapted form of the Fat-Related Diet Habits Questionnaire (Kristal, Shattuck, & Patterson, 1999). Items ask participants to indicate how often they ate different types of food that are high in fat using a 5-point scale ranging from *never or almost never* to *five or more times a week*. Items were summed for analyses and scores ranged from 18 to 90. The original scale has acceptable internal consistency and concurrent validity (Kristal et al., in press). This scale had a Cronbach’s alpha of .74 at pretest.

**Body Mass**

Body mass index (BMI = kg/m²; Garrow & Webster, 1985), based on self-report data, was used to reflect adiposity. Self-reported weight has been found to correlate well with confederate measured weight, with the correlations typically ranging from .96 to .99 (United States Public Health Service, 1988). Prior research has documented that BMI is a valid measure of adiposity with acceptable test-retest reliability (Garrow & Webster, 1985; Kraemer, Berkowitz, & Hammer, 1990; Stice et al., 1999).

**RESULTS**

**Preliminary Analyses**

Because we were not able to randomly assign students to the intervention and control conditions, control participants were matched to intervention participants to reduce the possibility that regression to the mean could account for any intervention effects. Regression to the mean refers to the processes wherein participants with extreme initial scores show a tendency to move toward the population mean when reassessed. Preliminary analyses compared intervention and control participants on all the variables assessed for this study using one-way analysis of variance (ANOVA) and chi-square analyses. The two groups were not significantly different on thin-ideal internalization, body dissatisfaction, depressive symptoms, eating disorder diagnoses, body mass, fat consumption, age, year in school, or ethnicity at pretest. However, the intervention group did report significantly greater dieting, $F (1/86) = 7.69, p < .01$, and eating disorder symptoms, $F (1/83) = 5.91, p < .05$, at pretest. To ensure an adequate sample size, up to 3 control participants were matched to each intervention participant (control participant eating disorder symptom scores had to be within .5 SD of the intervention participant score to be matched), resulting in a final sample size of 66 (17 intervention participants and 49 controls). Analyses verified that after matching, the intervention and control groups did not differ on any of the study variables ($p > .10$). Thus, the matching process effectively corrected for initial differences between the groups. Moreover, all analyses testing for intervention effects controlled for baseline levels of the outcome, to rule out the
possibility that any initial differences between groups (even if nonsignificant) accounted for apparent intervention effects. Because participants who self-selected into the class showed initial elevations in eating disturbances, this intervention might best be conceptualized as a targeted (i.e., selected), rather than universal, prevention program.

As 16 of the initial participants did not provide posttest data, 14 of whom were controls (most of whom simply dropped the course from which we had drawn controls), analyses tested for attrition biases. However, participants who dropped out of the study did not differ significantly from those who provided complete data on any of the study variables at pretest. Thus, attrition did not appear to have introduced systematic bias. To optimize statistical power, mean substitution was used to impute posttest values for participants who dropped out. Analyses also indicated that the attrition rate did not differ significantly across groups, suggesting that there was no differential attrition.

**Intervention Effects**

Repeated measures ANOVA models tested whether intervention participants experienced significantly greater reductions in thin-ideal internalization, body dissatisfaction, dieting, depressive symptoms, eating disorder symptoms, fat consumption, and body mass over time relative to matched controls. Separate models were carried out for each outcome, wherein condition was a two-level between-subjects factor and time was a two-level within-subjects factor. The hypothesized intervention effects would be supported in these models if there were significant Condition × Time interactions wherein the intervention group showed a greater decrease over time relative to the control group on the outcome measure. Means and standard deviations for the intervention and control groups at each wave of measurement are reported in Table 2, along with results from follow-up paired \( t \) tests used to probe the form of significant Condition × Time interactions (Bonferroni corrected \( \alpha = .025 \)).

Consistent with hypotheses, participants in the intervention showed significant decreases in thin-ideal internalization from pretest to posttest, whereas participants in the matched control condition did not. The significant Condition × Time interaction docu-

### Table 2. Pretest and posttest means and standard deviations for the intervention and matched control groups on the dependent variables

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Intervention Group</th>
<th>Matched Control Group</th>
<th>Percent Variance Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
</tr>
<tr>
<td>Thin-ideal internalization</td>
<td>30.9 (2.5)</td>
<td>28.3 (3.2)</td>
<td>29.8 (4.4)</td>
</tr>
<tr>
<td>Body dissatisfaction</td>
<td>32.6 (6.4)</td>
<td>27.9 (8.2)</td>
<td>31.3 (8.3)</td>
</tr>
<tr>
<td>Dieting behaviors</td>
<td>30.1 (10.8)</td>
<td>22.8 (9.7)</td>
<td>26.6 (8.6)</td>
</tr>
<tr>
<td>Depressive symptoms</td>
<td>9.4 (7.3)</td>
<td>7.2 (8.5)</td>
<td>8.9 (7.9)</td>
</tr>
<tr>
<td>Eating disorder symptoms</td>
<td>22.4 (13.7)</td>
<td>13.8 (11.3)</td>
<td>18.0 (11.1)</td>
</tr>
<tr>
<td>Fat consumption</td>
<td>30.9 (6.6)</td>
<td>30.8 (4.7)</td>
<td>31.6 (6.5)</td>
</tr>
<tr>
<td>Body mass</td>
<td>23.9 (3.5)</td>
<td>23.2 (3.2)</td>
<td>22.5 (4.5)</td>
</tr>
</tbody>
</table>

Note: Means within the same group with different subscripts were statistically and significantly different (Bonferroni corrected \( \alpha = .025 \)). Cell sizes were 17 for the intervention group and 49 for the control group. The percentage of variance explained by the Time × condition interaction is reported in the rightmost column (*\( p < .05 \). **\( p < .01 \)).
ments that the decrease over time in the intervention group was significantly larger than the (nonsignificant) change in the control group, $F (1/64) = 10.85, p < .005$. This effect accounted for 14.5% of the variance in change in thin-ideal internalization over time, which represents a clinically significant effect.

As expected, intervention participants reported significant decreases in body dissatisfaction from pretest to posttest, whereas matched control participants did not. The Condition $\times$ Time interaction was significant, $F (1/64) = 4.02, p < .01$, indicating that the decreases in body dissatisfaction were significantly stronger for the intervention condition relative to the matched control group. This effect accounted for 5.9% of the variance in change in body dissatisfaction over time.

Results also indicated that intervention participants showed the hypothesized decreases in dieting from pretest to posttest, whereas control participants did not. The significant Condition $\times$ Time interaction, $F (1/64) = 6.76, p < .05$, documents that reduction in dieting was significantly stronger for the intervention versus control participants. This effect accounted for 9.5% of the variance in change in body dissatisfaction.

In contrast to expectations, the Condition $\times$ Time interaction was not significant for depressive symptoms, $F (1/64) = 1.31, n.s.$ Moreover, there were no significant changes in depressive symptoms across time in the intervention or control groups.

Intervention participants also showed decreases in eating disorder symptoms from pretest to posttest, whereas control participants did not. The significant Condition $\times$ Time interaction, $F (1/64) = 7.95, p < .01$, documents that reduction in eating disorder symptoms was significantly stronger for the intervention versus control participants. This effect accounted for 11.5% of the variance in change in eating disorder symptoms. To provide a more direct index of the clinical importance of this intervention, analyses also tested whether the intervention resulted in a significant decrease in the rate of threshold and subthreshold eating disorder diagnoses. A Wilcoxon matched-pairs signed rank test indicated that there was a fourfold reduction in the overall rate of eating disorder diagnoses in the intervention condition from pretest to posttest (from 35% to 8%; $Z = -1.83; p = .06$), which was a marginally significant effect. In contrast, there was no significant change in the rate of overall eating disorder diagnoses from pretest to posttest in the control condition (from 17% to 18%; $Z = -1.01; p = .31$).

In contrast to expectations, the Condition $\times$ Time interaction was not significant for fat consumption, $F (1/64) = 0.08, n.s.$, and there were no significant changes in this outcome across time in either group.

Finally, intervention participants showed statistically significant decreases in body mass from pretest to posttest. This decrease represented an average of 3% reduction in body mass. Interestingly, the control participants showed a statistically significant increase in body mass during the same period, which represented an average of 4% increase in body mass. The significant Condition $\times$ Time interaction, $F (1/64) = 7.10, p < .01$, indicates that the decrease in body mass in the intervention condition was significantly different from the increase in the control condition. This effect accounted for 10.0% of the variance in change in body mass.

**DISCUSSION**

Collectively, findings indicated that intervention participants showed the expected decreases in thin-ideal internalization, body dissatisfaction, dieting, eating disorder symptoms, and body mass over the 4-month study period, whereas the matched controls
did not show any significant decreases in these outcomes. These effects would be considered medium in magnitude according to the Cohen (1988) criteria, suggesting that they are clinically meaningful. However, the expected effects for depressive symptoms and fat consumption were not observed. Although the sample size was only moderate and we were unable to randomly assign participants to experimental conditions, we believe that this is one of the first psychoeducational interventions to produce reductions in eating pathology and adiposity.

The most important finding was that this intervention seemed to result in decreased eating pathology, as most prevention programs have not realized this aim. That there was a fourfold reduction in the rate of threshold and subthreshold eating disorder diagnoses suggests this intervention had a clinically meaningful impact. It was also noteworthy that this intervention produced reductions in several documented risk factors for eating pathology (i.e., thin-ideal internalization, body dissatisfaction, and dieting), although other interventions have achieved this goal (Santonastoso et al., 1999; Winzelberg et al., 2000). Theoretically, these positive effects resulted from a confluence of several change processes. First, participants engaged in a critical analysis of the thin-ideal for women, including a focus on who perpetuates this ideal and the costs of pursuing it. In line with a dissonance perspective used in past prevention efforts (Stice, Mazotti, et al., 2000), this may have helped participants decrease their subscription to the thin-ideal. This lowered thin-ideal internalization is believed to have improved body satisfaction because participants were no longer aspiring for an unrealistic body shape. Moreover, increased body satisfaction theoretically would result in less intense dieting and improved mood, which would place participants at lower risk for eating-disordered behaviors. In support of this interpretation, intervention participants showed significant decreases in thin-ideal internalization, body dissatisfaction, and dieting. Second, the intervention included a segment on media portrayal of women, including information about how these images are often fabricated and how different the body dimensions of models are from the real weight and shape of women. This information may have helped buffer these women from the documented adverse effects of exposure to the thin-ideal images portrayed in the media, improving body satisfaction and affect. Moreover, the correction of misperceptions of weight and shape norms and of what body type men find attractive should have improved body satisfaction as well. The finding that the intervention resulted in increased body satisfaction is consistent with these speculations. Third, the information about the apparent ineffectiveness of typical weight control efforts might have resulted in decreased dieting, which was also supported by the findings. Finally, the provision of information about the adverse effects of eating disorders may have helped individuals gain motivation to discontinue unhealthy eating behaviors, which could have contributed to the observed decreases in eating pathology.

Another important finding was that intervention participants showed decreased body mass, whereas controls increased body mass over the same interval. These findings might suggest that the intervention prevented the natural increase in weight that occurs for college women, despite the relatively short duration of the study. That intervention participants showed a 3% decrease in body mass compared with a 4% increase observed among controls suggests this was a clinically meaningful effect, as weight reductions of this magnitude are accompanied by improvements in cholesterol, blood pressure, blood glucose levels, and other health indicators (Tremblay et al., 1999; Wing & Jeffery, 1995). Because there might be some concern that participants showed medically unhealthy weight loss, it is important to note that the mean BMI of intervention participants at posttest (23.3) was in the body mass range with the lowest mortality rate (Calle, Thun,
Petrelli, Rodriguez, & Heath, 1999). In addition, post-hoc analyses indicated that intervention participants with the highest initial body mass showed the most weight loss ($r = .43$). Indeed, initially overweight intervention participants showed three times the weight loss (average reduction of 1.5 BMI units) compared with initially nonoverweight intervention participants (average reduction of .5 BMI units). The evidence that the intervention reduced dieting and eating pathology suggests the possibility that participants decreased dieting behaviors, which led to lower rates of binge eating and consequent weight loss. Alternatively, the information on healthy weight management techniques might have resulted in increased exercise among intervention participants, which could have contributed to weight loss and body satisfaction. It is hoped that future eating disorder prevention programs will attempt to reduce obesity, as this eating disturbance results in far greater morbidity and mortality than all of the other eating disorders combined because it is much more common (Troiano et al., 1995).

The hypothesized effects for fat consumption and depressive symptoms were not realized. The first null finding suggests that reducing fat consumption is a difficult feat, as has been suggested by the limited success of past obesity prevention efforts (Story, 1999). It may be necessary for participants to be more accountable for weight changes or to monitor their caloric intake to reduce effectively fat consumption. The second null finding might imply that depressive symptoms per se are not intertwined closely with body image and eating disturbances. In hindsight, perhaps it would have been preferable to have had used a measure assessing negative mood state because it might have been more sensitive to detecting intervention effects.

It is important to consider potential alternative explanations for these findings. First, as students who self-selected into the intervention showed elevated eating disturbance, there is a possibility that regression to the mean explains the observed reductions in the outcomes. However, we were able to match successfully the intervention and control participants such that there were no significant differences at pretest on eating pathology or any of the risk factors assessed. As there were no significant reductions in any of the outcomes over the 4-month period for the matched control group, regression to the mean seems like an implausible explanation for the findings. Additionally, all analyses controlled for initial levels of the outcome, thereby ensuring that even nonsignificant group differences at pretest could not explain the effects. Other trials of prevention programs that used high-risk samples (Franko, 1998) did not find significant decreases in eating pathology in either the intervention or control groups, which suggests that this is an unlikely explanation.

Another alternative explanation is that the positive intervention effects were due to demand characteristics/expectancy effects. Although this explanation is impossible to rule out definitely in the absence of a placebo-controlled condition, it is not consistent with the fact that over a dozen prevention programs have not resulted in decreased eating pathology in their intervention groups (Santonastaso et al., 1999). If demand characteristics/expectations accounted for the current findings, it would seem that more prevention trials should have yielded reductions in eating pathology. Additionally, because participants were not told explicitly that this was an eating disorder prevention intervention, it is unlikely that demand characteristics or expectancies could have produced the observed findings. Nonetheless, it would be useful for future evaluations of prevention programs to use placebo-controlled conditions to rule out more definitely this alternative explanation for intervention effects.

It is interesting to speculate why certain interventions have been able to reduce eating pathology, whereas others have not. One commonality across the successful interventions...
is that they had a targeted nature, although not all targeted programs have reduced eating disturbances. The dissonance-based intervention that resulted in decreased bulimic symptoms targeted high-risk individuals (Stice, Mazotti, et al., 2000). Similarly, the individuals who signed up for the current intervention had elevated eating disturbances. More generally, there has been a trend for targeted prevention programs, compared with universal programs, to result in greater reductions in risk factors for eating pathology (Franko, 1998; Kaminski & McNamara, 1996; Winzelberg et al., 2000). It may be that those who have struggled with body image and eating-related issues have more motivation to engage in the programs and to attempt to change factors that contribute to their distress. An additional benefit of targeted programs is that they may be more cost-effective because resources can be focused more intensively on those at greatest risk.

Another intriguing explanation for effective interventions may be that participants in the successful trials were not informed that they were in an eating disorder prevention program. Participants in the dissonance intervention (Stice, Mazotti, et al., 2000) signed up for a “body acceptance group” and were never explicitly told that reductions in eating pathology were also expected. Participants in the current study enrolled in an advanced seminar at a university that was not advertised as an eating disorder prevention intervention. Perhaps individuals are less defensive about their body image and eating disturbances and are more willing to entertain alternative perspectives when they are not aware that they are in an intervention. An additional benefit of such a “covert prevention” approach is that it does not require insight regarding eating disturbances on the part of the participants to entice them into enrolling in the programs. This ultra high-risk group would be missed if insight is required for enrollment. Although this may appear to be ethically suspect, it should be noted that both interventions achieved their stated aims (i.e., improved body satisfaction and the provision of knowledge about eating disorders, respectively) and that the reduction in eating pathology was simply an additional benefit that was not divulged to participants until debriefing. One might conjecture that prevention programs for other adverse outcomes, such as unsafe sexual behaviors or substance abuse, could be improved through the adoption of such a covert prevention approach.

Limitations

It is important to consider the limitations of this preliminary trial when interpreting the results. First, we were unable to randomly assign participants to an experimental condition, which limited the confidence that can be placed in the inferred effects of the intervention. Second, the lack of a placebo-controlled condition makes it difficult to rule out the possibility that expectancy or demand characteristics contributed to the observed findings. Third, because we only assessed the participants at the termination of the intervention, there is no way of knowing whether these effects persist over time. Finally, the relatively small sample size of this preliminary trial limited our statistical power and the generalizability of our findings.

Implications for Prevention and Future Research

These preliminary results suggest that it might be profitable to evaluate this intensive psychoeducational intervention in a larger placebo-controlled randomized trial with a
longer follow-up period. Nonetheless, because there seems to be a widespread interest in eating disorder classes on college campuses, which are straightforward to conduct, it might be useful for departments to offer routinely such classes. Second, future prevention efforts might consider adopting the covert prevention approach, as it appears to hold promise. It would be interesting to attempt to test explicitly the hypothesis that such programs attract individuals with poorer insight and achieve positive effects in part because they circumvent defensiveness. Finally, it would be useful for future eating disorder prevention programs to include a focus on obesity, as this eating problem has dire health and mental health consequences.

REFERENCES


