

# Long-Term Impact of Treatment in Women Diagnosed with Bulimia Nervosa

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**Abstract: Objective:** Both cognitive-behavioral therapy (CBT) and antidepressant medication have demonstrated efficacy in the treatment of bulimia nervosa. However, data concerning the long-term impact of such treatments have been limited. This study sought to determine if treatment with CBT and antidepressant medication was associated with better long-term outcome among women diagnosed with bulimia nervosa. **Method:** Women ( $N = 101$ ) who completed a controlled treatment study of bulimia nervosa participated in follow-up assessments approximately 10 years later. **Results:** Women who received treatment with CBT or antidepressant medication or both reported improved social adjustment at long-term follow-up compared with women randomized to the placebo condition. **Discussion:** Treatments with demonstrated efficacy for short-term outcome appear to improve psychosocial function at long-term follow-up among women initially diagnosed with bulimia nervosa. © 2002 by Wiley Periodicals, Inc. *Int J Eat Disord* 31: 151–158, 2002; DOI: 10.1002/eat.10017

**Key words:** cognitive-behavioral therapy; antidepressants; bulimia nervosa

## INTRODUCTION

Cognitive-behavioral therapy (CBT) is regarded generally as the treatment of choice for bulimia nervosa. Several controlled treatment studies have demonstrated its superiority to other treatments in reducing target bulimic symptoms such as binge eating or vomiting (Agras et al., 1992, 1994; Fairburn et al., 1995; Fairburn, Kirk, O'Connor, & Cooper, 1986; Mitchell et al., 1990; Thackwray, Smith, Bodfish, & Meyers, 1993; Walsh et al., 1997; Wilson, Rossiter, Kleifield, & Lindholm, 1986). However, only one study (Fairburn et al., 1995) has demonstrated that CBT influences bulimic symptoms at long-term follow-up. Similarly, numerous placebo-controlled studies have supported the efficacy of antidepressant medication in reducing the frequency of binge eating episodes in patients with bulimia nervosa (Agras, Dorian, Kirkley, Arnow, & Bachman, 1987; Hughes, Wells,

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Cunningham, & Ilstrup, 1985; Mitchell & Groat, 1984; Pope, Hudson, Jonas, & Yurgelun-Todd, 1983; Walsh et al., 1997; Walsh, Hadigan, Devlin, Gladis, & Roose, 1991). Some researchers (Pope, Hudson, Jonas, & Yurgelun-Todd, 1985) have suggested benefits of continued treatment with antidepressant medication up to 2 years following baseline. However, no study has reported improved long-term outcome associated with antidepressant medication. Overall, little is known concerning the impact of treatment 10 years following presentation with bulimia nervosa.

Determining whether treatment is predictive of long-term outcome is an important consideration for evaluating the efficacy of interventions. It is crucial to explore associations between treatment and different domains of outcome (Keel & Mitchell, 1997). Fairburn et al. (1986) commented, "Bulimia nervosa is a complex condition with many different facets. Given the broad range of its psychopathology, it is surprising that so few aspects of the disorder have been assessed in studies of its treatment." (p. 639) Nearly 15 years later, it is similarly surprising that so few aspects of this disorder have been assessed in studies of the long-term impact of its treatment. The one study that supported the influence of CBT on the long-term outcome of bulimia nervosa evaluated the effect of treatment on eating disorder status alone (Fairburn et al., 1995). The purpose of the current study is to provide a more comprehensive exploration of the impact of treatment on different aspects of long-term outcome among women diagnosed with bulimia nervosa.

## METHODS

### Subjects

Women ( $N = 101$ ) who participated in a controlled treatment outcome study of bulimia nervosa between 1985 and 1987 (Mitchell et al., 1990) completed follow-up assessments between 1996 and 1997. Mean ( $SD$ ) duration of follow-up was 10.0 (0.7) years. The original study (Mitchell et al., 1990) recruited women who met criteria for bulimia as outlined in the 3rd ed. of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III; American Psychiatric Association [APA], 1980), with the additional criterion of binge eating coupled with purging episodes occurring at least three times per week for at least 6 months prior to study participation. Additional inclusion and exclusion criteria were reported in the original paper (Mitchell et al., 1990). Following recruitment and baseline assessments, women were entered into a placebo phase. Placebo responders were removed from the sample prior to randomization to one of four treatment conditions: (1) CBT plus imipramine, (2) CBT plus placebo, (3) imipramine alone, or (4) placebo alone. Subjects ( $N = 125$ ) who completed a minimum of 10 weeks of participation in their treatment condition were included in analyses for the original paper (Mitchell et al., 1990) and were recruited to participate in the present study. Of the 125 treatment completers, 115 (92%) were located and 102 (82%) participated. One woman was removed from the analyses. Her baseline and follow-up assessments indicated that she had never met full criteria for bulimia nervosa as outlined in the 4th ed. of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; APA, 1994) because her binge eating episodes were not objectively large. No baseline measure differed significantly between women who did and did not participate in follow-up assessments (all  $p$  values  $> .10$ ). Additionally, there were no significant differences between women who did and did not participate due to baseline treatment condition,  $\chi^2(3) = .70, p = .87$ ). The sample was predominantly Caucasian (99%) with only 1 non-Caucasian participant (1%). At

follow-up, women were a mean (*SD*) age of 34 (5) years. All but 1 subject (1%) had completed high school, 42% had completed 4-year college degrees, and 15% had completed graduate school. The majority of the sample described their occupational level as administrative (37%) or clerical/sales (29%), with approximately 10% each reporting working in manual (11%) or professional (10%) positions. At follow-up assessment, 66 women (65%) were in remission and 35 women (35%) suffered with some form of eating disorder of clinical significance (bulimia nervosa, anorexia nervosa, or an eating disorder not otherwise specified).

### Procedure

Subjects were contacted by one of the authors (JEM) by a letter that described the study and invited subjects to participate. Subjects could indicate their decision of whether or not they wished to participate by either returning an enclosed stamped postcard or by calling one of the authors (PKK). If subjects indicated an interest in participating, they were mailed consent forms and questionnaires that they were asked to complete at home. Subjects were also asked to complete an interview either over the telephone or in person. Face-to-face interviews were conducted either at the University of Minnesota's Eating Disorders Research Office or within subjects' homes. However, subjects living more than 1 hr from the research office were not offered the option of being interviewed in their home. Written informed consent was obtained from subjects at the time questionnaires were received, prior to the interview. Participants were paid according to the following schedule: \$50 for an office interview, \$30 for a home interview, and \$20 for a telephone interview. Across subjects, 51% participated in office interviews, 8% completed home interviews, and 41% completed telephone interviews. Among subjects completing telephone interviews, 50% lived out of state or more than 2 hr away from the research office. No significant differences were found between women who participated in face-to-face interviews compared with women who completed telephone interviews on follow-up measures (*p* values ranged from .63 to .98). However, some differences were observed on baseline measures. Specifically, women who participated in face-to-face interviews had significantly higher levels of depression and significantly worse social adjustment at baseline compared with women who participated in telephone interviews (*p* < .05). However, follow-up interview type was not associated with levels of body dissatisfaction or severity of eating disorder symptoms at baseline (*p* > .90). Interviews were audiotaped to determine reliability.

### Measures

Subjects completed questionnaire and interview measures prior to entering the placebo phase (baseline) and 10 years following initial evaluation (follow-up). Relevant to the present investigation, the following measures were employed.

#### Hamilton Depression Rating Scale Interview

The 24-item HDRS (Hamilton, 1960) was administered to the entire sample at both baseline and follow-up assessments. This interview assesses symptoms of depression. Average correlation of scoring between two raters was  $r = .88$  (Hamilton, 1960). Within the current sample, Cronbach's alpha was  $r = .83$  at baseline assessment and  $r = .89$  at follow-up assessment.

### **Body Dissatisfaction Scale of the Eating Disorders Inventory**

The Body Dissatisfaction subscale of the EDI (Garner, Olmsted, & Polivy, 1983) measures the belief that specific body parts, such as the hips, thighs, and buttocks, are too large. This subscale has demonstrated significant associations with other measures of body image disturbance (Garner et al., 1983) and was employed as the baseline measure of body dissatisfaction. Cronbach's alpha was  $r = .92$  for the Body Dissatisfaction scale in the current sample.

### **Body Shape Questionnaire**

The 34-item BSQ (Cooper, Taylor, Cooper, & Fairburn, 1987) was administered at follow-up as a measure of body dissatisfaction (Cooper & Fairburn, 1993). It measures concerns with body shape for the preceding 4 weeks. Discriminate validity of this scale (in distinguishing between women from a community sample and women with bulimia nervosa) was good and the correlation between the BSQ and Body Dissatisfaction subscale of the EDI was  $r(38) = .66, p < .001$  within a sample of bulimia nervosa patients, suggesting adequate concurrent validity (Cooper et al., 1987). Cronbach's alpha for the current sample was  $r = .98$ .

### **Eating Disorder Questionnaire**

Subjects completed the EDQ (Mitchell, Hatsukami, Eckert, & Pyle, 1985) at baseline and follow-up assessments. Self-reported frequencies of binge eating, vomiting, and laxative abuse episodes during the month prior to assessment were obtained from the EDQ.

### **Social Adjustment Scale - Self Report**

The 54-item SAS-SR (Weissman & Bothwell, 1976) comprises six subscales: Work, Social and Leisure, Extended Family, Marital, Parental, and Family Unit. Overall scale scores range from 1 to 5, representing the average item score across all items. The SAS-SR measures role performance, interpersonal relationships, friction, feelings, and satisfaction across different settings. The correlation for overall adjustment measured by interview versus self-report—derived social adjustment was  $.72$  (Weissman & Bothwell, 1976). The correlation between report by a psychiatrically ill patient and informant for overall adjustment was  $.74$  (Weissman, Prusoff, Thompson, Harding, & Meyers, 1978). Subjects completed the SAS-SR at both baseline and follow-up assessments. Cronbach's alpha for the overall adjustment scale was  $.85$  at baseline assessment and  $.78$  at follow-up assessment in the current sample.

### **Structured Clinical Interview for DSM-IV, Axis I Disorders**

SCID-I (First, Spitzer, Gibbon, & Williams, 1995) interviews were employed to assess eating disorder outcome. Interviewers were trained in conducting SCID-I interviews using the SCID training tapes prepared at the New York State Psychiatric Institute by First and Gibbon (1996) for DSM-IV. Additionally, supervision was available from a licensed clinical psychologist. Kappa reliabilities for all eating disorder diagnoses (anorexia nervosa, bulimia nervosa, eating disorder not otherwise specified) were  $\kappa = .81$  (lifetime) and  $\kappa = 1.00$  (current) in the present study.

### **Data Management and Analyses**

For all scales, responses to at least 80% of items were required for subjects' data to be included in analyses. Therefore, sample sizes differ across analyses. When at least 80%

but fewer than 100% of responses were present, scale scores were prorated according to the following equation (prorated scale score = number of items  $\times$  original scale score  $\div$  number of responses). A series of analyses of covariance (ANCOVAs) were performed to determine the impact of treatment on outcome variables controlling for baseline ratings of these variables. The ANCOVA was used instead of a repeated measures analysis or an analysis of difference scores because of the marked changes in variance from baseline to follow-up on some variables and the use of two different measures to assess body dissatisfaction. For each outcome variable, except binge eating frequency, the covariate removed a significant portion of variance from the analysis: HDRS,  $F(1, 97) = 8.57, p = .004$ ; EDI Body Dissatisfaction,  $F(1, 93) = 14.01, p = .000$ ; binge eating,  $F(1, 87) = 1.29, p = .26$ ; vomiting,  $F(1, 86) = 6.76, p = .01$ ; laxative abuse,  $F(1, 88) = 5.91, p = .02$ ; SAS-SR,  $F(1, 92) = 8.50, p = .005$ . A  $p$  value of .05 was set for statistical significance for all analyses. Data were analyzed using SPSS for Macintosh.

## RESULTS

Means and standard deviations for baseline and outcome variables within the four treatment conditions are shown in Table 1. Table 1 also presents results from ANCOVAs exploring the association between baseline treatment condition and outcome in the domains of depression, body dissatisfaction, bulimic symptoms, and social adjustment. No significant effects of baseline treatment were found for improvements in depression, body dissatisfaction, or bulimic symptoms at follow-up assessment. However, baseline treatment condition was significantly associated with improvement in social adjustment at long-term follow-up.

Post-hoc analyses were performed to assess which baseline treatment conditions were associated with superior improvements in life functioning at long-term follow-up. The

Table 1. Outcome variables at baseline and at follow-up within treatment condition

Outcome Domains	CBT + Medication <i>M (SD)</i>	CBT + Placebo <i>M (SD)</i>	Medication <i>M (SD)</i>	Placebo <i>M (SD)</i>	<i>F (df)</i>
Depression					
Baseline	14.1 (6.9)	11.7 (8.2)	12.8 (7.2)	12.3 (7.7)	0.31
Follow-up	5.4 (6.8)	5.7 (8.0)	5.8 (6.3)	4.2 (5.2)	(3,93)
Body dissatisfaction					
Baseline	16.9 (7.5)	10.8 (9.2)	15.9 (7.7)	18.0 (8.3)	0.65
Follow-up	88.2 (36.1)	76.2 (28.7)	92.4 (35.8)	102.4 (47.3)	(3,89)
Binge frequency <sup>a</sup>					
Baseline	5.9 (0.8)	6.3 (1.0)	5.9 (1.0)	5.6 (1.2)	1.23
Follow-up	2.5 (2.0)	2.4 (2.2)	2.5 (1.8)	3.4 (2.7)	(3,87)
Vomit frequency <sup>a</sup>					
Baseline	5.4 (1.8)	6.4 (0.9)	5.7 (1.8)	5.9 (1.1)	1.31
Follow-up	2.6 (2.3)	2.3 (2.2)	2.4 (1.7)	3.4 (2.6)	(3,86)
Laxative abuse <sup>a</sup>					
Baseline	2.0 (1.7)	1.3 (0.6)	2.1 (1.8)	1.9 (1.9)	0.40
Follow-up	1.2 (0.9)	1.0 (0.0)	1.4 (1.4)	1.3 (1.0)	(3,88)
Social adjustment					
Baseline	2.2 (0.4)	2.2 (0.4)	2.1 (0.4)	2.2 (0.5)	2.98*
Follow-up	1.8 (0.4)	1.8 (0.4)	1.7 (0.2)	2.1 (0.6)	(3,88)

\* $p < 0.05$ .

Note: CBT = cognitive-behavior therapy.

<sup>a</sup> Frequencies range from 1 never to 7 more than once a day.

Tukey HSD test was used to control for Type 1 errors. Employing equations and table values presented in Howell (1992), the minimum difference between two means that would be significant with  $r = 4$  steps was 0.29. The post-hoc analyses revealed significant differences between women in the placebo condition and women in the three active treatment conditions (mean differences ranged from 0.31 to 0.37), but no significant differences were found among the active treatment conditions (mean differences ranged from 0.02 to 0.06). Effect sizes ( $d$ ) for differences demonstrating statistical significance ranged from .73 to .88, reflecting a large effect size (Cohen, 1962). Women who received active treatment at baseline reported significantly better social adjustment at 10-year follow-up.

Paired  $t$  tests comparing baseline to follow-up SAS-SR scores revealed significant improvements for women in the three active treatment conditions: CBT plus medication,  $t(30) = 4.75, p < .001$ ; CBT plus placebo,  $t(23) = 3.76, p = .001$ ; medication,  $t(20) = 3.38, p = .003$ . Conversely, women in the placebo condition reported no significant change from baseline to follow-up,  $t(16) = .98, p = .34$ . Inspection of mean SAS-SR scores reveals that, at follow-up, women in the placebo condition reported levels of social adjustment that were similar to those reported by all women at baseline when their bulimia nervosa was active.

## DISCUSSION

Findings indicated that women who received treatment with CBT or with antidepressant medication or both reported improved social adjustment at long-term follow-up assessment compared with women in the placebo only condition. Treatments with demonstrated efficacy for improving short-term outcome in patients with bulimia nervosa appear to impact favorably psychosocial functioning at long-term follow-up as well. Across treatment conditions, baseline SAS-SR scores were equivalent to those reported for actively bulimic women in another study (Norman & Herzog, 1984). Among women within the active treatment conditions, follow-up SAS-SR scores fell below reported norms for women with depression, alcoholism, and schizophrenia (Weissman et al., 1978), below scores reported by women with bulimia nervosa (Norman & Herzog, 1984, 1986), and below scores reported by women 3 years after treatment for bulimia nervosa (Norman & Herzog, 1986). Conversely, women in the Placebo condition reported follow-up SAS-SR scores that were similar to scores reported by actively bulimic women (Norman & Herzog, 1984) and greater than reported for women with schizophrenia (Weissman et al., 1978). Although the range of follow-up SAS-SR scores across the treatment conditions may seem narrow, this range appears to represent a clinically meaningful difference in psychosocial functioning between women who did and women who did not receive active treatment. Our results partially replicate findings suggesting that CBT impacts long-term outcome (Fairburn et al., 1995). To our knowledge, this study is the first to indicate that treatment with antidepressant medications impacts long-term outcome.

Similar to results from our previous paper (Keel, Mitchell, Miller, Davis, & Crow, 1999), baseline treatment condition was not associated with improvement in bulimic symptoms nor was it associated with improvement in body dissatisfaction or depression at long-term follow-up. We suspect that these findings reflect two things, a three-phase model of psychotherapy outcome and treatment efficacy in speeding recovery (Howard, Lueger, Maling, & Martinovich, 1993). According to the three-phase model, improvements in

subjectively experienced well-being (Remoralization) precede and facilitate reductions in symptomatology (Remediation), which precede and facilitate enhancement in life functioning (Rehabilitation). Efficacious treatment likely speeds improvements in depression (Remoralization) and bulimic symptoms (Remediation) as demonstrated in the original treatment outcome paper (Mitchell et al., 1990). However, this effect may be masked by the natural course of the disorder as women slowly recover without the benefit of the most efficacious treatment (Keel et al., 1999; Keel & Mitchell, 1997). However, women who achieved improvements in depression and bulimic symptoms later in the course of their disorder may not have had adequate time to achieve a level of Rehabilitation (improvements in social adjustment) similar to that of women who received active treatment.

Although this study had a number of strengths, certain weaknesses should be noted. First, although our participation rate was quite high compared with other follow-up studies, approximately 18% of the target sample did not participate in follow-up assessments. It is possible that women who had worse social adjustment at long-term follow-up were less likely to participate. However, there were no significant differences in participation rates across baseline treatment conditions, so this bias should not effect the main finding that treatment improves psychosocial functioning. Second, we employed different measures of body dissatisfaction at baseline and follow-up assessments, introducing a source of variability unrelated to treatment or symptomatology. However, evidence supports the concurrent validity between the EDI Body Dissatisfaction scale and BSQ as measures of body dissatisfaction (Cooper et al., 1987). Finally, because of the extended follow-up period, it was not possible to gather detailed information concerning treatment women received subsequent to their participation in the initial study. However, women were randomized to their baseline treatment condition. Therefore, any impact of subsequent treatment may reflect a sensitizing effect of initial active treatment, and this effect would remain clinically meaningful. Strengths of this study include its long duration of follow-up, large sample size and resulting statistical power, use of randomization to baseline treatment conditions, use of psychometrically sound instruments, and evaluation of several outcome domains. To our knowledge, this is the first long-term follow-up of a treatment outcome study for bulimia nervosa assessing the impact of treatment on several facets of outcome.

In summary, the present paper supports the efficacy of both CBT and antidepressant medication in impacting long-term outcome among women previously diagnosed with bulimia nervosa. Future studies may benefit from exploring different facets of outcome among women diagnosed with bulimia nervosa in order to understand both the immediate and long-term effect of treatment interventions.

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