Exposure with Response Prevention, Training in Energy Balance, and Problem Solving Therapy for Bulimia Nervosa

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Eight bulimic females completed a 16-week comprehensive behavioral treatment program consisting of three interventions: exposure with response prevention (ERP), training in energy balance (EB), and personal social problem solving (PSPS). Together the interventions contributed to a 89.9% average reduction in vomiting below the baseline level. Significant changes were also evident in self-report measures of psychopathology, social anxiety, and depression. Five of six subjects available at a one year follow-up maintained or enhanced the gains made during the course of treatment.

The application of behavior therapy to bulimia nervosa can be traced to the seminal work of Fairburn (1981) who described a comprehensive treatment program and the clinical outcome for 11 patients. Fairburn's program consists of a two-phased sequence of behavioral/cognitive interventions. The goal in the first phase is to break the association between binge eating and purging by controlling food intake on the assumption that more appropriate eating will reduce purging. A variety of behavioral

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International Journal of Eating Disorders, Vol. 5, No. 1, 035–45 (1986) © 1986 Published by John Wiley & Sons, Inc. CCC 0276-3478/86/010035–11\$04.00 interventions, mostly borrowed from the weight reduction literature, are utilized in this first phase including self-monitoring of eating, meal scheduling, stimulus control, and goal setting, among others.

The second phase of Fairburn's program focuses on changing maladaptive beliefs and attitudes towards food, weight, and body shape under the assumption that bulimic behavior has its origin in these beliefs. Interventions in this second phase include problem-solving, cognitive restructuring, and instructions to eat both feared foods and foods associated with binge/purge episodes. More recently, Fairburn (1984) has expanded this behavioral program to a third phase that concentrates on the maintenance of therapeutic change and relapse prevention.

Fairburn's (1981) treatment plan has been extended and refined in subsequent reports by others. For example, Rosen and his colleagues developed the intervention *ERP* similar to Fairburn's instructions to eat feared foods. However, in contrast to Fairburn, Rosen's rationale is based on viewing bulimia as an anxiety disorder in which vomiting motivates bingeing. *ERP* is implemented by having patients eat several meals per week with the therapist. Research by Rosen and others (Leitenberg, Gross, Peterson, & Rosen, 1984; Rosen and Leitenberg, 1982; Johnson, Schlundt, Kelly & Ruggiero, 1984) has documented the effectiveness of this intervention.

Similarly, Johnson et al. (1984) have elaborated on Fairburn's technique of controlling bingeing by developing an intervention referred to as training in energy balance (*EB*). The major assumption of this intervention is that many bulimics lack the skill and/or knowledge to control adequately their weight. Accordingly, *EB* targets binge eating and weight control by developing appropriate eating habits, proper nutrition, and regular aerobic exercise. In evaluating this intervention, Johnson et al. (1984) found it to be effective in controlling food intake and reducing vomiting.

In Johnson et al. (1984) both *ERP* and *EB* were effective in reducing bulimic symptoms with neither being superior to the other. However, the sequential combination of interventions was insufficient in dealing with the total bulimic symptoms complex. Specifically, during the course of this study many patients experienced negative moods as a result of an inability to cope with personal/social problems. In turn, these negative moods often precipitated binge/purge episodes (Schlundt, Jarrell, & Johnson, 1984).

The present study had a twofold purpose. First, we wanted to specify further Fairburn's (1984) problem-solving treatment component and to evaluate its contribution in reducing bulimic symptoms following *ERP* and *EB*. The *PSPS* component was designed both to teach coping skills to bulimic women, enabling them to deal more effectively with the problems they encountered, and to observe the influence of this training on binge/purge cycles. Our second purpose was to replicate previous positive findings with *ERP* and *EB*.

METHOD

Subjects

Twelve consecutive females consulting the Eating Disorders Program and satisfying Russell's (1979) criteria for bulimia nervosa (e.g., fear of obesity, binge-eating, and purging) constituted the sample. The duration of symptoms ranged from 2 to 20 yrs. (mean = 6.25 yrs.) and no subject was using purgatives or other drugs at the time. All subjects had at least a high school education and half were college graduates. The subjects ranged from 19 to 35 yrs. of age (mean = 26.5 yrs.) five were married, five were single, and two were divorced. One subject was obese (EM) at 35% of ideal body weight, and three had prior history of anorexia (EC, FD, and ME) with two maintaining body weights at the lower limits of normal (EC, 11%; ME, 12%). Three subjects had received prior treatment for their eating disorder: EC, estrogen therapy; FD, antidepressants and psychotherapy; and CW, psychotherapy.

Assessment Measures

During individual interviews prior to treatment, information was collected on eating behavior, social adjustment, vocational status, medical history, and the chain of behaviors involved in binge/purge episodes. Self-report questionnaires including the *Health Habit Survey*, *SCL-90* (Derogatis, 1977), the *Social Avoidance and Distress* (SAD) scale (Watson & Friend, 1969), the *Fear of Negative Evaluation* (FNE) scale (Watson & Friend, 1969), and the *Binge Scale* (Hawkins & Clement, 1980) were administered after the initial interview and again at treatment termination. Physical measures were also taken at these times including height, weight, skinfold measures, and the Harvard Step Test (Montoya 1978).

Subjects were instructed to record all instances of food intake in specially designed booklets for the duration of the study. They recorded the date, time of day, the place and social circumstances of eating, event prior to eating, degree of hunger, mood prior to eating, whether they binged, and whether self-induced vomiting occurred after the eating episode.

Therapists

Three therapists were involved in the treatment study. Two were experienced clinical psychologists (WGJ, DGS) and the other a clinical psychology graduate student (MPJ). In all cases, each therapist conducted the complete treatment program with his assigned subjects.

Treatment Methods

The behavioral treatment program consisted of three components: *ERP*, *EB*, *PSPS*. Following a two-week baseline period, each treatment component was implemented over approximately four weeks with two sessions per week during *ERP* and one session per week during *EB* and *PSPS*. Order of component presentation for ten subjects was *ERP*, *EB*, and *PSPS*. Two subjects received the order *PSPS*, *EB*, and *ERP* to counterbalance the order of presentation. No additional subjects were assigned to this order due to the difficulty encountered in following *EB* with *ERP*. Specifically, a major portion of training in *EB* includes the development of proper nutrition and appropriate eating habits. In contrast, *ERP* involves eating in the laboratory the type and/or amount of food that approximates a binge. The incompatibility of following *EB* with *ERP* was evident in the resistance of these two subjects to the implementation of this order.

ERP Intervention.

The objective of *ERP* was to extinguish vomiting by repeatedly exposing subjects to problem eating situations (i.e., binges), and then preventing the occurrence of vomiting (Rosen & Leitenberg, 1982). In the laboratory setting, subjects were presented with moderate to large amounts of food consistent with their eating and binge habits. They were then instructed to eat until they experienced a strong urge to vomit or until all of the available food was gone. While eating, their attention was focused on the sight, smell, and taste of the food and on sensations of bloatedness and fear of weight gain.

Immediately after eating, subjects were engaged in casual discussion for approximately 30 to 45 minutes and assured that the feelings of bloatedness and urge to vomit would subside. During this discussion, the therapist occasionally asked the subjects how bloated they felt and whether or not they had an urge to vomit. Sessions were terminated when the bloated sensation and urge to vomit were no longer apparent. At the end of the session, subjects were instructed to refrain from vomiting for the rest of the day and to practice the *ERP* procedure at least once between sessions.

Training in EB.

EB training was designed to reduce the frequency of binge eating by improving eating habits, teaching proper nutrition, and promoting aerobic exercise. The major elements of *EB* were extracted from the behavioral weight control program outlined by Johnson and Stalonas (1981). In the present study, the elements were introduced in a gradual fashion and included scheduled eating, stimulus control, a balanced diet, eating topography modification, cognitive restructuring, regular exercise, and self-

rewards for changes in eating habits. Homework tasks, such as exercise monitoring and graphing the number of unscheduled eatings, were assigned at each session.

The PSPS Intervention.

Following Fairburn (1984, pp. 177-178) PSPS was individualized in an attempt to help patients deal more effectively with problem situations which typically led to negative moods and binge/purge episodes. PSPS was implemented in the following steps: (1) a general orientation towards how problems often go unresolved due to ineffective coping behaviors which are frequently applied in an automatic and impulsive fashion; (2) problem definition in which concrete, real-life examples of actual problems experienced by patients are identified in discussion and by a review of self-monitoring records; (3) generation of alternative coping behaviors involving an unrestricted attempt to explore as many alternatives as possible; (4) decision making including the evaluation of the various outcomes associated with the alternatives and the eventual selection of those which appear desirable; (5) verification whereby the patient performs the more desirable coping behavior when problems arise. During the decisionmaking stage, many patients were unable to perform appropriately the alternative coping behaviors and, thus, it was necessary to employ other cognitive/behavioral techniques such as cognitive restructuring, assertiveness training, time and stress management, and heterosexual skills training.

RESULTS

Of the 12 subjects starting treatment, 3 (ME, FD, EO) dropped out over an inability to comply with the self-monitoring. One subject, CW, refused to participate in *ERP* after completing *EB*. In spite of these failures to complete the protocol, these 4 subjects displayed the following reductions in vomits/day/week following the intervention under the baseline levels: ME—baseline = 1.85 to *ERP* = .74; FD—baseline = 3.21 to *EB* = 2.65; ED—baseline = 1.43 to *ERP* = .41; and CW—baseline = .87 to *EB* = .30.

The remaining eight subjects provided sufficient data for statistical analysis of the influence of the interventions on vomiting, food intake, self-report measures, and measures of physical fitness. The frequency of vomiting constituted the major index of bulimic behavior. However, the number of food intakes was also included as an indirect measure because it is often associated with excessive snacking/bingeing and is targeted in the *EB* intervention.

Effects of Interventions on Self-Induced Vomiting

To evaluate whether significant changes in vomiting occurred, a *t*-test was used to compare the frequency of vomiting during baseline to the frequency of vomiting during the last phase of treatment. As a group, the eight subjects completing treatment were vomiting an average of 1.96/ day/week during baseline and this rate fell to .09/day/week during the final phase of treatment. This reduction in the rate of vomiting of 1.87/day/ week is significant (t = 2.45, p < .05). The percent reduction in vomiting was also computed according to the following formula: (1-final phase vomiting/baseline vomiting × 100). Subjects completing treatment showed a mean of 89.9% reduction in the rate of vomiting.

Figure 1 displays the mean frequencies of vomits/day/week and the probabilities of vomiting given a meal for each subject by intervention phase. This latter variable was computed because the frequency of vomits/day/week is related to the number of food intakes/day. Thus, the probability of vomiting any given meal was computed separately for each subject to adjust for the different numbers of eating episodes during subsequent phase of treatment. Figure 1 shows reductions in the mean frequencies and the probabilities of vomiting as a result of treatment. Also, with the exception of JM and KC, it appears that each treatment component contributed incrementally to reductions in the variables. As indicated by chi-square values presented in Figure 1, changes in the probabilities of vomiting were statistically significant for all subjects.

Effects of Interventions on Food Intake

The mean number of intakes during baseline for all 12 subjects were also computed. A *t*-test was then used to determine whether baseline eating differed from the stated goal in *EB* of 3 meals/day. While the number of intakes/day varied greatly, the mean value during baseline (4.26 intakes/day/week) was not significantly greater than the ideal of 3 meals/day (t = 1.47, p < .20).

Next, the number of food intakes/day/week by treatment phase was computed for the eight subjects completing treatment. The mean number of intakes/day/week during baseline ($\overline{M} = 4.26$, sd = 2.43) decreased to a mean of 3.48 (sd = .60) intakes/day/week during *ERP*, 2.92 (sd = .56) intakes/day/week during *EB* and ended at 3.14 (sd = .79) intakes/day/week during *PSPS*. On the average, then, these eight subjects reduced their mean number of intakes/day/week by 1.12 (t = 1.53, p < .20) over the course of treatment. As expected, the greatest reduction in food intakes occurred during *EB*. However, given the finding of an average of 4.26 intakes/day/week during baseline, no statistically significant reduction was anticipated.

It is interesting to note that one subject, EC, showed an unusually high number of intakes/day/week during baseline ($\overline{M} = 10.2$) and that this number substantially reduced to 3.7/day following *PSPS*.

Performance on Self-Report Measures

Group means for all 12 subjects were compared to both the normal female and psychiatric female outpatient norms on the *SCL-90*. Compared to the general female psychiatric outpatient norms, scores of the present group of bulimics are quite unremarkable as the group profile does not vary markedly from a *t*-score of 50. However, when compared to a population of normal females, the group of bulimics showed significantly elevated *t*-scores, ranging from 60 to 74, with profile peaks occurring on the *depression* and *psychoticism* scales.

Similarly, the pretreatment scores of the 12 subjects on the *SAD* and *FNE* were compared to the means for normal females presented by Watson and Friend (1969). Here, the bulimic pretreatment scores were significantly higher on the *SAD* (t = -4.24, p < .01) than normals, but did not differ from female norms on the *FNE* (t = 1.42, p < .20).

Statistically significant improvements from pre- to post-treatment for the eight subjects were evident on the following scales of the SCL-90: somatization, obsessive-compulsive, interpersonal sensitivity, depression, general symptom index, and the positive symptom distress index. Significant improvements were also observed on the SAD, FNE, and the Binge Scale scores.

These self-report data indicate that the bulimics entering treatment were significantly distressed compared to normal females with respect to depression, psychotic symptoms, and interpersonal anxiety. More importantly, a comparison of pre- and post-treatment measures shows significant reductions in the levels of these self-reported symptoms to normal levels.

Changes in Physical Measures

Because the *EB* intervention focused on regular aerobic exercise and maintaining ideal weight and body fat ranges, pre-post changes for the eight subjects were evaluated over these measures. Following treatment, the eight subjects showed an average weight loss of 2.31 lbs. (t = 1.05, ns) and an average reduction in body fat of 1.1% (t = .88, ns). These non-significant changes were anticipated and consistent with the goals of *EB* as subjects who were heavier than their ideal weight had lost weight, while those who were initially below their ideal weight gained with corresponding changes noted in percent body fat. In contrast, statistically significant changes were expected and evident on the physical fitness index (p < .01).





Figure 1. Average number of vomits/day/week— \overline{M} vomit—and the probability of vomiting—P(vomit)—by treatment phase.





Figure 1. Average number of vomits/day/week— \overline{M} vomit—and the probability of vomiting—P(vomit)—by treatment phase.

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DISCUSSION

In the present study, eight of twelve completed a treatment program in which ERP, EB, and PSPS were presented sequentially. Vomiting and the number of food intakes were monitored over the course of treatment. Statistically significant changes in vomiting were evident for all eight subjects completing treatment. As a group, they displayed a reduction in the frequency of vomiting from approximately twice a day during baseline to less than once a week over the course of treatment. For most of these subjects, each intervention contributed to a reduction in frequency of vomiting, however, due to the sequential nature of the interventions, no definitive statements can be made regarding their independent contribution. While the number of food intakes during baseline was not significantly different from the target of three a day, there was a clinically significant reduction in those cases where eating was at excessively high frequencies. Unfortunately, only six of eight subjects who completed treatment were available at a one-year follow-up. Yet, five of these maintained the gains made during treatment. These five subjects were exercising regularly and were either symptom free or reported less than one binge/purge episode a month.

These results provide further specification and support for the treatment program outline by Fairburn (1981; 1984). The results also contribute to a growing body of literature on the effectiveness of cognitive behavioral therapy for bulimic symptoms. Recent studies by Conners (Conners, Johnson, & Stuckey, 1984) and Kirkley (Kirkley, Schneider, Agras, and Bachman, 1985) found similar reductions in bulimic symptoms with behavioral therapy conducted within a group format. Further research on cognitive behavioral techniques for bulimia will focus beyond target symptoms to include a broader range of cognitions, beliefs, conflicts, and life stresses that may be functionally related to binge/purge cycles (Lacey, 1984).

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