

# Cognitive therapy, nutritional therapy and their combination in the treatment of bulimia nervosa

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## ABSTRACT

**Background.** This study compared the effectiveness of cognitive therapy (CT), nutritional therapy (NT), the combination of cognitive and nutritional therapy (CNT), against a control condition of support group (SG) in the treatment of bulimia nervosa.

**Methods.** One hundred female out-patients who fulfilled DSM-III-R criteria for bulimia nervosa were randomized to the four treatment groups. NT and CT were designed to cover different areas with minimal overlap, and CNT provided all of the features of both of these treatments. The control condition was conducted in a group self-help format. Each of the treatments lasted 14 weeks.

**Results.** All three active treatments as well as SG produced significant decreases in binge/vomit episodes. Intent-to-treat analysis found CNT and CT to be significantly more effective than SG in retaining subjects in treatment and completion of study, as well as in producing greater improvements in dysfunctional attitudes and self-control. CNT was superior to SG in achieving abstinence from bulimic behaviour. NT was superior to SG only in increase of self-control. Logistic regression found that the cognitive component, whether given alone or in conjunction with NT, and higher pre-treatment self-control scores were significant predictors for both completion of study and abstinence.

**Conclusion.** CT (either alone, or in combination with nutritional therapy) remains the treatment of choice for bulimia nervosa. A treatment escalation approach should be tested for the treatment of bulimia with the more intensive and less widely available CT (with or without nutritional counselling) offered after patients have failed the less intensive and more widely available support group treatment.

## INTRODUCTION

The realization that bulimia nervosa (BN) is a reasonably common disorder coupled with increased understanding of its deleterious effects on health (Russell, 1979) has resulted in a search for an effective treatment (Fairburn, 1981). BN has been conceptualized as disturbed eating habits arising out of dysfunctional cognition (Fairburn, 1981), as variants of an anxiety (Rosen & Leitenberg, 1982), or as depressive

disorder (Hudson *et al.* 1983). Although there are differing theories regarding the disturbed eating habits in BN, multi-component cognitive behaviour treatment programmes utilizing cognitive restructuring (Ordman & Kirschenbaum, 1985; Rossiter & Wilson, 1985), eating habit control techniques (Fairburn, 1981; Johnson *et al.* 1984) and nutritional counselling (Hsu & Holder, 1986) have demonstrated substantial clinical benefits in reducing many bulimic behaviours. Not surprisingly, therefore, cognitive behaviour therapy (CBT) has emerged as the treatment of choice for bulimia nervosa (Fairburn *et al.* 1992).

As described by Fairburn *et al.* (1993a), CBT

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is designed to alter abnormal attitudes about body shape and weight, replace dysfunctional dieting with normal eating habits, and develop coping skills for resisting bingeing and purging. As conceptualized by Fairburn & Wilson, the treatment consists of 19 sessions divided into three stages and lasts roughly 20 weeks. In the three stages a cognitive view of the maintenance and modification of the disorder is explained and information about weight regulation and nutrition are presented to the patients as being critical to eliminating eating disorders. In addition, the therapist introduces cognitive restructuring and self-regulatory behavioural strategies for reducing the frequency of binge eating and normalizing eating patterns. By targeting the core features of BN, CBT has been shown to produce rapid change while demonstrating good maintenance of therapeutic improvement (Fairburn *et al.* 1995). Despite these promising results, however, the prevalence of bulimia nervosa and the relative lack of specialist treatment facilities warrant the need to develop forms of treatment that can be widely used in primary care settings (Waller *et al.* 1996).

Attempts have already been made to dismantle CBT into its individual components to determine if each component is as effective as the whole. In a dismantling study by Freeman *et al.* (1991), the authors found the behaviour modification component to be as effective as the complete CBT method and concluded that the addition of cognitive procedures to the behavioural treatment is unnecessary. In contrast, Fairburn *et al.* (1991) found CBT to be superior to behaviour modification in terms of improving eating attitudes, and that behaviour modification alone resulted in a much higher drop-out rate. Fairburn *et al.* (1993*a*) further reveal that the Freeman *et al.* (1988) study failed to specifically examine important changes in eating attitudes, other than binge/purge episodes, which are central to the cognitive view of BN and critical for discriminating between the effects of the whole CBT and alternative treatments. More recently, Fairburn *et al.* (1993*b*) found the effect of behaviour modification to be short-lived with a large proportion of patients who initially improved with behaviour modification subsequently suffering a relapse. With Agras *et al.* (1989) also finding CBT to be more effective than self-monitoring of eating behaviour alone,

it appears that the complete CBT method is more effective than some of its individual components.

Nutritional management has been compared against stress management in the treatment of bulimia nervosa (Laessle *et al.* 1991), and found to be effective in producing a rapid improvement in general eating behaviour and reduction in binge frequency. Therefore, we believe it is feasible to 'dismantle' the CBT of BN into its two components: cognitive therapy and nutritional counselling (Hsu *et al.* 1991). Implicit in the CBT approach to BN is the concept that dietary restriction, self-imposed to achieve a thin body, perpetuates the binge/vomit cycle. Even when not bingeing or purging, bulimics rarely eat more than one meal a day (Mitchell *et al.* 1985; Hsu, 1990; Laessle *et al.* 1991). Bulimic patients often indicate that if they have eaten something that they normally forbid themselves to eat, they would feel compelled to go on a binge. Prolonged semi-starvation may lead to the onset of binge-eating, as demonstrated by Keys and his associates (1950). Russell (1979) therefore suggests that the bulimic patient's cravings for food are the result of her starved body rebelling and demanding to be fed.

Many CBT programmes thus employ nutritional counselling that includes meal planning, nutritional education (Willard *et al.* 1983; Roy-Byrne *et al.* 1984; Huon & Brown, 1985; Kirkley *et al.* 1985; Hsu & Holder, 1986; Johnson *et al.* 1986; Wolchik *et al.* 1986), and weekly weighing (Fairburn, 1981; Lacey, 1983; Hsu & Holder, 1986). However, in contrast to the detailed description given to the CBT component, the nutritional counselling component is almost always mentioned only briefly in these publications.

Although there may be some overlap between cognitive therapy and nutritional counselling, the primary focus of each approach is quite distinct. Cognitive therapy is aimed at changing the cognitions and behaviours that initiate or perpetuate a binge-vomit cycle. Nutritional counselling encourages the development of healthy eating habits including the acquisition of greater nutritional knowledge, and development of healthy food buying habits and food preparation techniques (Hsu *et al.* 1992). Thus, for instance, daily monitoring of food intake may be approached from either a cognitive

perspective (i.e. to identify the antecedents to binge-purge behaviour) or a nutritional perspective (i.e. to implement regular and healthy eating habits).

To the best of our knowledge, no study has explored the moderators of treatment for BN. In depression, CBT targeted at specific deficits found it to be more effective in subjects with higher functioning and less deficit, contrary to initial expectation that depressed patients who showed targeted deficits would benefit the most from CBT (Simons *et al.* 1985; Rude & Rehm, 1991; Burns *et al.* 1994).

For this study, we have dismantled the multi-component CBT into the two components of cognitive therapy alone (CT, to distinguish it from the un-dismantled CBT) and nutritional counselling alone (NT). We compared CT, NT and combined cognitive and nutritional therapy (CNT) against a self-help support group (SG) control condition. Additionally, we explored the contribution of the cognitive and the nutritional component to treatment effectiveness by comparing the subjects that had either of these components against those that did not.

## METHOD

### Subjects

One hundred female out-patients who fulfilled DSM-III-R (Spitzer *et al.* 1988) criteria for bulimia nervosa were randomized to the four conditions. Randomization was stratified according to presence or absence of concurrent major depression. Additional entry criteria included: (1) bodyweight within 85 to 125% ideal bodyweight; (2) age between 17 and 45; (3) binge eating and vomiting on average at least three times a week in previous 6 months (we have chosen the frequency of three times a week for 6 months instead of twice a week for 3 months as stipulated in the DSM-III-R to ensure that our cohort of patients was severely and persistently ill); (4) no alcohol or substance abuse in previous 12 months; (5) absence of psychotic features; (6) absence of suicide attempt within last 6 months; (7) not currently receiving psychotropic medication. After a complete description of the study was provided, a written informed consent was obtained.

Patients were terminated from the study and declared treatment failures if the following

occurred: (1) non-attendance for three consecutive weeks without a legitimate reason (e.g. being out of town); (2) deterioration in clinical condition such that in-patient admission or the use of medication became necessary. Patients were free to withdraw from the study at any time.

Abstinence was defined as no bingeing/vomiting or laxative/diuretic/diet pill use in the week prior to post-treatment assessment at week 14. All patients who withdrew from the study prior to week 14 were considered non-abstainers.

### Assessment

Assessment focused on eating behaviour and attitudes, dysfunctional thoughts and attitudes, general psychopathology, and social adjustment. Assessment instruments include: Structured Clinical Interview for the DSM-III-R (SCID-OP I) (Spitzer *et al.* 1988); and, Schedule for Eating Disorders (an interview to gather an eating disorder history, previous treatment and family history). In this study, the schedule also used for to establish a diagnosis of bulimia nervosa, and to determine the frequency of binge/vomit episodes (Hsu 1985, unpublished). A binge was defined as: (a) consuming an objectively larger amount of food (than what most people would eat) within a discreet period of time; and (b) a feeling of loss of control over the eating process at that period of time. The Schedule for Eating Disorders was semi-structured but not standardized and no standardized eating disorder instrument was administered in the study.

In addition, the following assessment instruments were included: Eating Disorder Inventory (EDI) (Garner *et al.* 1983); Intake Inventory (ITI), a self-report daily record of meals and binge/purge activity; Hamilton Depression Rating Scale (HDRS) (Hamilton, 1960); Dysfunctional Attitudes Scale (DAS) (Weissman & Beck, 1978); and, Self-Control Scale (SCS) (Weissman *et al.* 1971). Full assessment using all instruments was conducted pre-treatment, week 6, week 10 and post-treatment (week 14), and self-report measures and HDRS administered at week 6 and week 10. Eating behaviours were assessed based on the pattern in the previous 7 days. Assessment was conducted by an experienced, independent assessor blind to the treatment condition of the patient.

### Treatment

Treatment lasted 14 weeks. This treatment duration was chosen primarily because this was the length of time required to cover the elements of each treatment group. There were 16 sessions (except for the support group, which is described below), two per week for the first 2 weeks and thereafter one per week for the duration of the treatment period. Each individual session lasted about 1 h, but patients assigned to the had 2 h sessions (1 h of nutritional counselling and 1 h of cognitive therapy).

The NT and CT were designed to cover different areas with minimal overlap, and the combined treatment provided all of the features of both of these treatments. These treatments were conducted according to a written manual to ensure comparability of treatment. Information on these two different treatments has been previously published (Hsu *et al.* 1991, 1992).

NT (Hsu *et al.* 1992), conducted according to a written manual, was administered by three experienced registered dietitians (who have had previous experience in counselling eating disorder patients). During the 3½ year study period, three dietitians treated the patients randomized to NT and CNT. Briefly, NT was aimed at helping the patient to understand the principles of good nutrition, her nutritional needs, and the nutritional relationship between over-restrictive eating and binge eating. In addition, the programme aimed at helping the patient to establish and maintain a pattern of regular eating through meal planning, including buying and preparing healthy food.

CT (Hsu *et al.* 1991) conducted according to a written manual, was administered by two experienced therapists. Briefly, CT was aimed at helping the patient to understand and to identify the antecedents of a bulimic episode, the thoughts and feelings during an episode, the functions of the episode, and the beliefs and values that perpetuate the bulimic behaviour. It also aimed at helping the patient to develop alternative coping behaviours through the use of specific techniques such as cognitive restructuring and training in problem-solving skills to combat urges to binge and vomit. Finally, six sessions of exposure and response prevention were implemented according to the approach of

Rosen & Leitenberg (1982) and Leitenberg *et al.* (1984). Briefly, subjects were asked by the cognitive therapist to draw up a hierarchy of feared foods the consumption of which almost invariably led to a binge. They were asked to bring in the least feared food on the list to a CT session (usually during week 9 or 10 of treatment) and ate a small amount of it in front of the therapist. The therapist then used reassurance, psycho-education and cognitive restructuring to prevent bingeing as well as vomiting. At the following session a 'more-feared' food was brought in and the process repeated.

All of the sessions were audiotaped and one in four tapes was monitored by one of us (L.K.G.H.) for adherence to the treatment manuals and to maintain minimal overlap.

During the 3½ year period SG was conducted by two recovered patients and a mother of a recovered patient. These support groups, based on self-help principles and therefore not led by a therapist, have been a part of our eating disorders treatment programme for several years and have been quite popular. Each group session lasted about 90 min. Support groups were 'open' and on average each group had six to eight patients (all females with anorexia or bulimia nervosa). For practical reasons, each group had, at any one time, one to two study patients, while the rest were non-study clinic patients. The study patients attended 14 sessions. All group sessions were audiotaped, but there was no written manual or format. A large variety of issues were brought up and discussed during these sessions, and sometimes experiential and psychodrama techniques were used.

### Statistical analyses

Because whether or not a subject completed the study was correlated with type of therapy, study outcomes were analysed by 'intention to treat', with the last available measurement used as the final outcome. This approach minimizes the differences between the treatment groups since many individuals will not have had the full course of therapy, however, it compares the effectiveness of the treatments as they are conducted in practice, rather than the efficacy of each treatment in those that completed treatment.

Baseline characteristics of the subjects were compared using analysis of variance (ANOVA)

for the continuous variables and chi-squared contingency table testing for the categorical variables. Study outcomes were analysed using chi-squared contingency testing (for study completion and whether abstaining at the end), Kruskal–Wallis non-parametric ANOVA and Mann–Whitney tests (for weeks in study), and analysis of covariance (ANCOVA) (for changes in binges, vomiting, meals eaten, HDRS, DAS and SCS) with age, percentage body weight at intake, duration of bulimia nervosa and initial depression (as measured by HDRS at intake) as covariates to correct for their potential confounding effects. If the ANCOVA was significant, it was followed by specific paired comparisons using the Least Significant Difference approach. *P* values  $\leq 0.05$  were considered statistically significant and all testing was two-sided. The data were entered into and analysed using SPSS.

The above analyses examined the relationships between the four treatment groups, exploring hypotheses of how these groups themselves differed. Additionally, completion, weeks in study, and abstinence were analysed to see if they were related to whether the treatment condition included a cognitive or nutritional component. For these analyses, multiple linear and logistic regression were used and comparisons adjusted for age, duration of illness, baseline percentage bodyweight, baseline HDRS, DAS, and SCS to remove the effects of potential confounding.

## RESULTS

### Baseline characteristics at intake

Subjects assigned to the four treatment groups did not differ significantly in any demographic, behavioural, or psychological measure, thus supporting the randomization design of the study (Table 1). It is particularly interesting that 46% of the patients had received previous treatment (in-patient and/or out-patient) for BN, but without success.

### Is active treatment better than control treatment?

#### *Study completion*

To qualify as a ‘completer’, subjects would have to complete the 14 weeks treatment programme. Of the 100 women enrolled in the study, 73

patients (73%) completed the study while 27 (27%) dropped out. The study outcome and number of completers in each group is listed in Table 2.

Comparing the three active treatments to SG, BNT and CT were superior to SG in number of subjects reading completion of study ( $\chi^2(1) = 7.69$ ,  $P = 0.006$  and  $\chi^2(1) = 5.51$ ,  $P = 0.019$  respectively).

#### *Weeks in study*

CNT and CT were superior to SG in being able to retain subjects in the study when measured in terms of weeks in study, while NT was not. (CNT *v.* SG: Mann–Whitney  $U = 211$ ,  $z = -2.715$ ,  $P = 0.007$ ; CT *v.* SG; Mann–Whitney  $U = 204$ ,  $z = -2.589$ ,  $P = 0.01$ .)

#### *Abstinence*

Abstinence rates across each treatment are listed in Table 2. Comparing each active treatment against SG, only BNT was superior ( $\chi^2(1) = 5.23$ ,  $P = 0.022$ ), i.e. more subjects in CNT achieved abstinence than subjects in SG.

#### *Binge/vomit episodes*

On intent-to treat analysis, all three active treatments as well as SG produced significant decrease in binge ( $t(99) = 8.01$ ,  $P < 0.001$ ) and vomit episodes ( $t(99) = 7.56$ ,  $P < 0.001$ ). The three active treatments did not differ from SG in reducing either the binge or vomit frequency reduction.

#### *Meal pattern*

There was a significant increase in number of meals eaten per day in the entire population across all treatments ( $t(99) = 7.87$ ,  $P < 0.001$ ). The three active treatments did not differ from SG in number of meals eaten.

#### *Eating attitudes, cognitions and depression*

##### *(i) Eating Disorder Inventory (EDI)*

On intent-to treat analysis using ANCOVA followed by Least Significance Difference (LSD) procedure, CNT was superior to SG in reducing the following subscales of the EDI: DT ( $P < 0.001$ ), B ( $P = 0.0045$ ), I ( $P < 0.001$ ), P ( $P < 0.001$ ), ID ( $P = 0.001$ ), IA ( $P = 0.027$ ). CT was superior to SG in the following: DT ( $P = 0.011$ ) I ( $P = 0.001$ ). NT was not different than SG in any of the changes in EDI subscale scores.



Table 1. Pre-treatment clinical features in 100 bulimic patients

	Treatment group				Total N = 100
	Nutritional N = 23	Cognitive N = 26	Combined N = 27	Support N = 24	
Age (in years)	24.2 (5.6)	23.3 (5.0)	24.1 (5.3)	26.5 (9.1)	24.5 (6.4)
Duration (in years)	5.0 (4.4)	5.5 (3.2)	5.9 (3.7)	6.4 (6.3)	5.7 (4.5)
History of anorexia nervosa, N	9 (39%)	10 (38%)	11 (41%)	11 (46%)	41 (41%)
Previous treatment for bulimia	11 (48%)	11 (42%)	11 (41%)	13 (54%)	46 (46%)
% average body weight	114.5 (9.4)	112.5 (9.6)	110.2 (8.7)	111.9 (10.4)	112.2 (9.5)
Binge episodes/week	12.3 (10.8)	7.2 (4.3)	12.1 (7.0)	12.2 (13.4)	10.9 (9.5)
Vomiting episodes/week	13.3 (11.2)	7.7 (5.0)	13.4 (9.2)	14.5 (13.6)	12.2 (10.3)
Meals eaten/week, mean	11.4 (6.8)	10.0 (7.1)	10.9 (5.8)	11.0 (7.3)	10.8 (6.7)
HADS	18.04 (7.54)	14.92 (8.04)	18.89 (8.28)	18.79 (7.86)	17.64 (8.01)
DAS	144.17 (43.12)	152.23 (34.08)	164.37 (31.85)	161.42 (45.54)	155.86 (38.95)
SCS	3.87 (25.89)	9.81 (29.75)	2.37 (25.72)	1.67 (31.31)	4.48 (28.01)

( ) Standard deviation unless stated as %.

No variables differed at 0.05 level across groups.

HADS, Hamilton Depression Rating Scale; DAS, Dysfunctional Attitude Scale; SCS, Self-Control Scale.

Table 2. Treatment outcome

	Nutritional N = 23	Cognitive N = 26	Combined N = 27	Support N = 24
Weeks in study	10.91 (4.42)	12.92 (2.91)	12.78 (3.56)	9.21 (5.61)
Completion of treatment	14 (61%)	22 (85%)	24 (89%)	13 (54%)
Achieving abstinence	4 (17%)	9 (35%)	14 (52%)	5 (24%)
Change in binge/week	-8.39 (10.43)	-4.92 (4.97)	-9.41 (7.59)	-5.79 (11.44)
Change in vomit/week	-9.43 (11.42)	-5.73 (5.02)	-10.56 (8.42)	-4.58 (13.28)
Change in meals/week	4.87 (6.97)	5.42 (6.50)	7.07 (5.86)	3.79 (7.83)
Change in HDRS	-5.96 (11.11)	-4.46 (7.98)	-8.33 (7.35)	-4.33 (8.08)
Change in DAS	-12.00 (49.27)	-27.08 (31.73)	-43.63 (32.22)	-6.83 (33.34)
Change in SCS	9.52 (19.77)	14.85 (22.35)	24.19 (20.98)	-2.50 (15.40)

( ) Standard deviation unless stated as %.

#### (ii) Dysfunctional Attitudes Scale (DAS)

All three active treatments and SG reduced DAS significantly ( $t(99) = 5.92$ ,  $P < 0.001$ ). CNT and CT were both superior to SG in reducing DAS scores ( $P < 0.0001$  and  $P = 0.016$  respectively).

#### (iii) Self Control Scale (SCS)

All three active treatments and SG increased SCS ( $t(99) = 5.48$ ,  $P < 0.001$ ). All three active treatments were superior to SG in improving self-control ( $P < 0.0001$ ,  $P = 0.001$ ,  $P = 0.032$  respectively).

#### (iv) Hamilton Depression Rating Scale (HDRS)

All three active treatments as well as SG reduced HDRS ( $t(99) = 6.69$ ,  $P < 0.001$ ). Active treatments were not significantly different than SG in HDRS reduction.

#### Is one active treatment better than another?

Although it was not our initial intention to compare one active treatment against another, we, nevertheless, decided to examine the data to determine how well the three active treatments performed when compared against each other.

CNT performed better than NT in weeks in study (Mann-Whitney  $U = 231$ ,  $P = 0.039$ ), study completion ( $\chi^2(1) = 5.33$ ,  $P = 0.021$ ), and achieving abstinence ( $\chi^2(1) = 6.47$ ,  $P = 0.011$ ). On intent-to-treat analysis using ANCOVA followed by LSD procedure, CNT performed better than NT in reducing several EDI subscales (DT ( $P = 0.006$ ), B ( $P = 0.006$ ), I ( $P = 0.003$ )), the DAS ( $P = 0.006$ ), and SCS ( $P = 0.011$ ). In contrast, CT was superior to NT only in the bulimia subscale of the EDI ( $P = 0.029$ ). How-

ever, CNT and CT were not different in any of the measures.

The cognitive component of the active treatments was clearly superior to the nutritional component, whether delivered alone or in conjunction with the nutritional component. For study completion, logistic regression found the cognitive component and pre-treatment SCS to be significant predictors (Wald (1) = 10.25,  $P = 0.001$ , and Wald (1) = 4.50,  $P = 0.034$  respectively). Similarly, for achieving abstinence, the cognitive component and pre-treatment SCS were significant predictors (Wald (1) = 6.48,  $P = 0.011$  and Wald (1) = 5.03,  $P = 0.025$  respectively). In contrast, none of the other variables tested (age, duration of illness, percentage bodyweight, DAS, HDRS, nutritional component) was found to be significant predictors for either study completion or achieving abstinence.

## DISCUSSION

This study has a number of shortcomings. We have not utilized a standardized eating disorder interview in the evaluation of subjects and therefore our reliance on non-standardized interviews and subjects' self-reports may have resulted in bias. The four treatment conditions vary in the amount of time in treatment, CNT and SG had longer treatment time than CT and NT, thus leaving open the possibility that greater duration or intensity of treatment in itself may have improved treatment effectiveness. The lack of follow up of our subjects precludes us from determining if treatment effects are maintained over time. Finally, each assessment of eating behaviours (baseline, week 6, 10, 14) was based on the pattern (meal, binge, vomit) during the previous 7 days, a shorter period than currently considered acceptable.

Overall, the three active treatments and the control condition produced improvement in almost all measures. This would suggest that even minimal treatment such as self-help groups may improve bulimic behaviours and dysfunctional attitudes, at least in the short-term. Bulimic subjects are often reluctant to seek treatment. In a 5 year follow-up study, Fairburn *et al.* (2000) found that only 40% of a community sample of 82 bulimic subjects had ever had treatment for their eating disorder. Perhaps

encouragement to attend a self-help support group may be less threatening or intimidating to these patients than encouragement to seek professional help. Obviously, longer term follow-up is needed to determine whether improvement from self-help is maintained over time.

A second main finding is that CT, whether given alone or in conjunction with NT, had a clear superiority for the treatment of bulimia nervosa when compared to the control condition, SG. Furthermore, the cognitive component is clearly superior to the nutritional component when the outcome of those treated with each component is compared against the outcome of those that were not treated with the respective component. Subjects receiving the cognitive component were more likely to stay in treatment longer, to complete treatment, to become abstinent, and to improve in terms of eating-attitudes and self-attitudes than those not treated with the cognitive component.

The relative lack of effectiveness of NT over the control condition was contrary to initial expectation. The only measure on which it was superior to SG was increase in SCS scores. In the aforementioned study of Laessle and colleagues (1991), nutritional management which shared many common components with the NT in our study, was quite effective in normalizing eating behaviours. However these investigators did not employ a minimal treatment group. Moreover, they gave advice on the use of stimulus control techniques to avoid uncontrolled eating, and encouraged their subjects to eat feared or binge foods. To us, both techniques suggested the incorporation of cognitive behavioural elements. Our findings suggest that the eating disturbances in bulimia nervosa are unlikely to benefit greatly from improved nutritional knowledge, careful meal planning and better-informed food procurement or preparation when these components are given alone without the cognitive elements.

CNT, the combined treatment condition, was superior to CT alone in two respects: achieving abstinence and completion of study. CNT was superior to the other dismantled component, NT, in most measures. As already mentioned, this greater effectiveness of CNT may be related to longer treatment time. However, the fact that SG also had longer treatment time (50% more than CT or NT) but was comparatively the least

effective may suggest that longer treatment time alone may not necessarily be therapeutic. Alternatively, the greater effectiveness of CNT may mean that NT, although relatively ineffective when given alone, may argue the effectiveness of CT when the two are given in conjunction. A third possibility is that perhaps a bulimic subject is more able to make use of the nutritional knowledge when the distorted cognitions and dysfunctional attitudes are changed. Studies should be designed to determine how the cognitive and nutritional components interact with each other.

Another factor that may augment the effectiveness of CT is self-control. In our study, higher pretreatment SCS scores was a significant predictor of both treatment completion and abstinence. This may be clinically relevant since none of the other pretreatment variables such as age, duration of illness, percentage bodyweight, depression, dysfunctional attitudes or abnormal eating attitudes seem to predict treatment outcome. The fact that subjects given CT were encouraged to develop greater self-control over dysfunctional cognitions and impulsive behaviours suggests that higher pretreatment SCS may facilitate the acquisition of skills to enhance self-control. In depression treatment trials, investigators have postulated that higher SCS may indicate greater learned resourcefulness, and higher pretreatment SCS scores were found to predict greater improvement in subjects undergoing self-control therapy and CBT (Simons *et al.* 1985; Rehm *et al.* 1987). In contrast, those with lower SCS improved less with CBT and more with pharmacotherapy (Simons *et al.* 1985). While some investigators have suggested that the 'effect size' of learned resourcefulness may be relatively small in the treatment outcome of depression (Burns *et al.* 1994), we believe that the construct of self-control should be further explored in treatment studies of bulimia nervosa.

The findings of this dismantling study suggest that it is time to test the effectiveness of a treatment escalation approach for bulimia nervosa (Waller *et al.* 1996). CNT or CT without the NT component, while quite effective, are costly and labour intensive, less widely available and perhaps less acceptable to the patient than a self-help support group. Our finding that the minimal treatment control condition can lead to substantial improvement in bulimic behaviour

and self- and eating-attitudes suggests that it may be offered as a first line treatment, while a more intensive treatment such as standard CBT may be offered only to those who failed the less intensive treatment.

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