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**Cognitive-behavioral therapy for bulimia nervosa and atypical bulimic nervosa:
Effectiveness in clinical settings**

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Running head: CBT FOR BULIMIC DISORDERS

**Cognitive-behavioral therapy for bulimia nervosa and atypical bulimic nervosa:
Effectiveness in clinical settings**

Abstract

Objective: The efficacy of cognitive-behavioral therapy (CBT) for bulimic disorders has been established in research trials. This study examined whether that efficacy can be translated into effectiveness in routine clinical practice.

Method: Seventy-eight adult women with bulimic disorders (bulimia nervosa; atypical bulimia nervosa) undertook individual CBT, with few exclusion criteria and a treatment protocol based on evidence-based approaches, utilizing individualized formulations. Patients completed measures of eating behaviors, eating attitudes, and depression pre- and post-treatment. Eight patients dropped out. The mean number of sessions attended was 19.2.

Results: No pretreatment features predicted drop-out. Treatment outcome was similar whether using treatment completer or intent to treat analyses. Approximately 50% of patients were in remission by the end of treatment. There were significant improvements in mood, eating attitudes and eating behaviors. Reductions in bingeing and vomiting were comparable to efficacy trials.

Discussion: The improvements in this 'real-world' trial of CBT for adults with bulimic disorders mirrored those from large, funded research trials, though the conclusions that can be reached are inevitably limited by the nature of the trial (e.g., lack of control group and therapy validation).

Keywords:

Bulimia nervosa; atypical bulimic disorders; cognitive-behavioral therapy; effectiveness

Cognitive-behavioral therapy for bulimia nervosa and atypical bulimic nervosa:**Effectiveness in clinical settings**

There is substantial evidence that cognitive-behavioral therapy (CBT) is efficacious in the treatment of adult women with bulimia nervosa and atypical bulimic disorders (1-7). However, that evidence has come from funded research studies. Such findings are not necessarily generalizable to the wider range of clinical settings, due to factors such as the exclusion of comorbidity or atypical cases, treatment being delivered under highly stringent conditions, and the need to adhere strictly to protocols. Thus, such evidence of efficacy in the research environment needs to be translated into evidence of effectiveness in less specialized clinical practice, in order to avoid clinicians ignoring the evidence as being irrelevant to their client group (8). This attitude might explain the common omission of core techniques when delivering CBT for adults with eating disorders (9) and the fact that only a minority of clinicians report using manuals when working with bulimia nervosa (10). There is evidence for the clinical applicability of research-based CBT for anxiety and depression (11-12). However, that is not the case in the eating disorders. Therefore, this study considered whether the efficacy of CBT for bulimic disorders (as shown by existing research trials) can be translated into clinical effectiveness in routine clinical settings, where none of the exclusion- and protocol-based constraints outlined above apply.

Method**Participants**

All patients were treated in a publically-funded outpatient eating disorder service in the UK. The only exclusion criteria were psychosis, learning difficulties, or an inability to work in English. The participants in the trial were a case series of those patients with bulimic disorders who opted to undertake CBT when assessed and when treatment options were discussed. A small number of patients opted to undertake a psychodynamic therapy, while another group attended for assessment but declined or failed to attend for treatment. However, the numbers in these groups were not recorded. Therefore, this is a study of those who opted to begin CBT, rather than all who attended the clinic or who had bulimic

disorders. None were excluded from the trial due to missing data (see below).

The sample entering treatment were 78 adult women with bulimic disorders - 55 with bulimia nervosa (52 purging subtype; three non-purging subtype) and 23 with EDNOS involving bulimic behaviors (nine with subthreshold bulimia nervosa, involving bingeing and purging at least once per week over three months; ten with binge eating disorder; and four with purging in the absence of bingeing). None were in the anorexic weight range. All were assessed using a semi-structured interview protocol (13), and diagnosed using DSM-IV criteria (14). The mean age of the sample at assessment was 27.8 years ($SD = 7.11$) and their mean body mass index (BMI) was 22.1 ($SD = 3.26$).

A minority of the bulimic sample ($N = 9$) were receiving SSRI antidepressants (stabilized prior to treatment and maintained throughout the treatment period) and a small number had occasional dietetic reviews, but none were receiving any other form of treatment in parallel with CBT. A high proportion had some comorbidity (major depressive disorder - 44% of cases; obsessive-compulsive disorder - 26%; other anxiety disorders - 32%; substance misuse - 23%). The levels for anxiety and depressive disorders are higher than in some efficacy studies (3), but comparable for substance misuse.

Measures

Height and weight were measured objectively. Diaries were used to assess frequency of bingeing and vomiting. The women also completed measures of eating pathology and depression at the beginning and end of treatment.

Eating Disorders Inventory. The EDI (15) is a self-report measure of eating and related attitudes. Scores are responsive to changes over treatment. Scores on the eating-related scales (Drive for thinness; Bulimia; Body dissatisfaction) were summed to provide an overall score reflecting eating attitudes.

Beck Depression Inventory. The BDI (16) is a self-report measure of depressive symptoms, with good psychometric properties.

Treatment

This version of CBT (13) is based on techniques employed in evidence-based

approaches to bulimia nervosa (1,2,4) , In keeping with those approaches, this programme includes: individualized formulation, taking into account different maintaining factors across cases (e.g., nutritional and/or emotional drivers for bingeing); agenda setting; homework; change in diet (particularly to improve carbohydrate intake); diary-keeping; exposure; behavioral experiments; cognitive restructuring; and surveys. Comorbidity was usually addressed once the core eating disorder symptoms were substantially reduced, unless there was evidence that the patient was not changing eating behaviors in the early part of CBT.

The clinicians were all clinical psychologists with at least four years of experience in delivering CBT for eating disorders, and were supervised routinely on these cases (individually and in groups). The usual assumption was that there would be around 20 one-hour CBT sessions. However, this was reduced if the patient improved rapidly, and was increased if the patient had substantial comorbidity (such increases were reviewed by the team after each additional set of ten sessions). Whatever the duration, behavioral change was maintained as a focus, along with changes in mood and cognitions. The mean number of sessions delivered per patient was 19.2 (SD = 12.4; range = 7-80). Three follow-up sessions were offered in addition.

Patients were regarded as in remission if they no longer had a diagnosis of any eating disorder by the end of treatment (including being free of bulimic behaviors for at least a month prior to the last session, and not having pathological concerns about eating, weight and shape). This latter criterion was established through clinical review. Drop-out was defined as the patient ending treatment before the agreed termination point (defined by patient and clinician), whether early or late in treatment.

Data analysis

Binary logistic regression was used to identify any pre-treatment factors that predicted drop-out (17). Change was measured in three ways – as the proportion of patients ceasing individual and all bulimic behaviours (objective binge-eating, vomiting, laxative abuse) by the end of treatment; as the proportion of patients who changed or no longer met diagnostic criteria at the end of treatment (remission); and as the dimensional differences in

frequencies of behaviours, BMI level, eating attitudes and depression. As the data were not sufficiently normal, changes in symptom levels were tested using Wilcoxon tests. This final analysis is done as both a treatment completer analysis and an intent-to-treat analysis (carrying forward the most recent data to substitute for missing data where a patient dropped out). At the end of treatment, there were nine missing EDI scores and 12 missing BDI scores. These were treated as absent for the completer analysis.

Results

Predictors of attrition

Eight of the 78 patients dropped out over the course of treatment. This rate is similar to that reported in protocol-driven research studies (3-4,18). Binary logistic regression was used to determine whether drop-out was related to pre-treatment age, BMI, frequency of bingeing or vomiting, EDI scores or BDI scores. The overall model was not significant ($\chi^2 = 11.5$, $df = 6$, $P = .075$), and no individual variable approached significance ($P > .16$ in all cases). Therefore, no identified pre-treatment variables predicted attrition from CBT.

Cessation of bulimic behaviours following CBT

Among the completer group, 66 engaged in objective bingeing at the beginning of treatment, and 28 at the end of treatment (abstinent = 58%), 51 engaged in vomiting at the beginning and 25 at the end (abstinent = 51%), and 17 engaged in laxative abuse at the beginning and three at the end (abstinent = 82%). 56% were free of all bingeing and purging behaviours by the end of treatment (all patients had at least one of these behaviours at the start of treatment). These reductions are comparable with those reported across treatment in clinical trials (3).

Change in diagnosis following CBT

Table 1 shows shifts in diagnoses from beginning to end of CBT. Overall, 37 (52.9%) of the 70 patients who reached the end of treatment were diagnosis-free by that point (no bulimic behaviours, alongside normalised eating attitudes). Assuming no such change among the eight patients who had dropped out, this represents 47.4% of the 78 patients who started CBT. This remission rate is similar to that found in comparable research (2-4).

Insert Table 1 about here

Diagnostic group at the outset of treatment was not broadly predictive of change in diagnosis. However, those with purging disorder showed a mixture of positive and negative outcomes, suggesting that this form of CBT is more suitable for those who binge-eat.

Dimensional change in symptoms following CBT

Table 2 shows changes across therapy in body mass index, frequencies of bulimic behaviors, eating attitudes, and depression. This is done separately for treatment completers ($N = 70$) and as an intent to treat analysis ($N = 78$). Regardless of the form of analysis, there were significant changes on all of these measures, with a small increase in BMI and larger reductions in objective binges, vomiting, eating attitudes and depressed mood. The effect sizes ($\tau = Z/\sqrt{[N]}$) for these changes varied between medium and large in both sets of analyses. The frequency of objective bingeing fell by 59% in the treatment completer analysis (intent to treat - 64%), and vomiting levels fell by 72% (intent to treat - 65%). These findings are similar to levels of change reported in the literature (7).

Insert Table 2 about here

Discussion

Research trials have demonstrated the efficacy of CBT for bulimic disorders. However, clinicians commonly regard such findings as irrelevant to their practice (8). Therefore, this study tested whether those findings can be translated into evidence of effectiveness in healthcare settings where there are few exclusion criteria and where the implementation of the therapy is less intensively scrutinised. It also included atypical bulimic cases. The findings were broadly comparable to those found in research trials - the drop-out

rate was low (10.3%), the remission rate was approximately 50%, and there were substantial reductions in levels of pathological eating attitudes and depression. In short, these findings demonstrate that this form of CBT for bulimia nervosa (13) is effective in treating the eating disorders in 'real-life' clinical settings. However, it is important to note that these results were achieved by clinicians within a specialist eating disorder clinic, who had relatively high levels of training, experience and supervision. Its effectiveness in other settings or as delivered by less experienced clinicians remains to be demonstrated. It is also necessary to note that this was an uncontrolled trial, with no validation checks (beyond routine supervision) to confirm that the therapy delivered actually was CBT. While these features are inevitable consequences of delivering treatments in real life settings, they limit the strength of any conclusions that can be reached regarding the effectiveness of CBT.

Several forms of CBT for adults with eating disorders have been shown to be efficacious to a comparable degree in research settings (1-4). Each shares themes with the form used here - particularly the foci on individualized formulation, exposure, behavioral change, recording, and cognitive restructuring. Therefore, these findings suggest that other evidence-based forms of CBT for the bulimic disorders might have similar levels of effectiveness in purely clinical settings, although the lack of a control group in studies of this sort makes it impossible to conclude definitively that it is elements of CBT that are responsible for the positive outcomes seen. Clinicians could be encouraged to use existing manualized forms of CBT for bulimia nervosa more than they currently do (9-10), on the grounds that these relatively structured forms of treatment for the eating disorders can be as effective in everyday clinical settings as they are efficacious in research settings. Further work is needed to determine whether these effects are maintained in the long term, as they are in research trials. Such research would also benefit from a wider range of measures of eating pathology (e.g., body image, other purging behaviours), as the measures used here were relatively crude, and might have omitted key indices of change. It should also consider the potential role of factors such as duration of disorder, previous treatment experiences, and socio-economic status, to allow for comparison with existing and future clinical trials.

Finally, it will be important to determine whether the efficacies of other therapies for bulimic disorders (e.g., interpersonal psychotherapy; dialectical behavior therapy) are matched by their effectiveness.

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Table 1

Diagnostic outcomes at end of treatment, among those completing CBT (N = 70)

<u>Diagnostic group at beginning of treatment</u>	Diagnostic group at end of treatment				
	No eating disorder	Bulimia nervosa		EDNOS	
		Purging subtype	Non-purging subtype	Atypical bulimia nervosa	Binge eating disorder
Bulimia nervosa					
Purging subtype (N = 46)	22 (47.8%)	22 (47.8%)	0	2 (4.3%)	0
Non-purging subtype (N = 1)	1 (100%)	0	0	0	0
EDNOS					
Atypical bulimia nervosa (N = 9)	5 (55.6%)	0	0	4 (44.4%)	0
Binge eating disorder (N = 10)	8 (80.0%)	0	0	0	2 (20.0%)
Purging disorder (N = 4)	1 (25.0%)	0	1 (25.0%)	1 (25.0%)	0

Table 2

Symptom change across treatment among those completing CBT (N = 70) and using intent-to-treat analysis (N = 78)

Type of analysis	Treatment completers						Intent-to-treat						Effect size	
	Beginning of treatment		End of treatment		Wilcoxon test		Beginning of treatment		End of treatment		Wilcoxon test			
Point in treatment	Mean	(SD)	Mean	(SD)	Z	P	tau	Mean	(SD)	Mean	(SD)	Z	P	tau
Symptom^a														
Body mass index	22.8	(3.58)	23.3	(3.80)	2.98	.003	0.36	22.1	(3.26)	22.8	(3.67)	3.61	.001	0.41
Objective binges per week	4.45	(6.51)	1.84	(5.07)	3.25	.001	0.39	5.51	(9.65)	1.98	(4.86)	4.93	.001	0.56
Vomiting per week	5.31	(7.96)	1.49	(3.28)	2.93	.003	0.35	6.88	(10.1)	2.41	(5.29)	2.83	.005	0.32
Eating Disorders Inventory	46.0	(15.4)	26.3	(21.0)	2.39	.02	0.29	37.6	(21.8)	24.1	(22.5)	2.58	.01	0.29
Beck Depression Inventory	22.7	(9.95)	12.2	(11.0)	4.78	.001	0.57	21.9	(9.46)	12.1	(10.5)	4.59	.001	0.52

^a No missing data for body mass index, objective binges or vomiting episodes, and no missing start of treatment data for other variables.

Missing data for Eating Disorders Inventory and Beck Depression Inventory mean that completer $N = 61$ and 58 , respectively.