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Behavioural interventions in the treatment of eating disorders

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Key words

Eating disorders; behaviour therapy; anorexia nervosa; bulimia nervosa; nutrition

Key points

- Nutritional change is key to the treatment of all eating disorders
- Other behavioural methods are also important – particularly exposure and skills development
- Clinicians routinely fail to deliver on these key behavioural elements of therapy

Behavioural interventions in the treatment of eating disorders

Synopsis

Behavioural methods are inherent in many evidence-based treatments for eating disorders, and have also been used separately. This review demonstrates that behavioural methods are necessary in the effective treatment of eating disorders – particularly the improvement of nutrition and exposure-based methods. It is also possible that these methods are sufficient to treat anorexia nervosa, though other elements are needed on the treatment of bulimia nervosa. The impacts and mechanisms of behavioural and nutritional change merit serious attention in clinical work and research. However, clinicians are often reluctant to use these methods, and that needs to be the focus of supervision.

Behavioural interventions in the treatment of eating disorders

Introduction

Behaviour therapy is rooted in the principles of learning (e.g., operant and classical conditioning). Behavioural strategies are action-based and highly focused, aiming to reduce or eliminate problematic behaviours through new learning. Behavioural interventions are present in a large proportion of evidence-based treatments for psychological disorders, though there is often a focus on the other elements of those treatments (e.g., focusing on the cognitive rather than the behavioural methods). In relation to treatments for eating disorders, there has been limited consideration of the importance of behavioural interventions and learning principles. Are behavioural methods either necessary or sufficient to explain the outcome of evidence-based therapies for patients with eating disorders?

In its 2017 update, the National Institute for Health and Clinical Excellence (NICE) (1) recommended a limited set of evidence-based psychological treatments for eating disorders, which included cognitive-behavioural therapy (CBT), family based treatment (FBT) and specialist supportive clinical management (SSCM)[1]. A common element of these treatments is a relatively strong focus on using behavioural strategies to reduce eating disorder symptoms, with all interventions particularly focused on normalizing eating habits and weight. Each of these therapies integrates behavioural strategies with other elements, such as structural, systemic, and narrative interventions in FBT, and cognitive strategies in CBT. Consequently, it is not clear which are the necessary components of each therapy. Understanding which components of each treatment are necessary is pertinent to the efficient and effective delivery of psychological therapies for any disorder. In other psychological disorders, it has been demonstrated that the behavioural elements of treatment are sufficient to generate most of the change that is attributed to the full therapy (2-4). Very few studies

[1] While other treatments that include behavioural strategies have been researched (e.g., dialectical behaviour therapy, acceptance and commitment therapy), their lower level of benefit (1) means that they will not be included here.

have dismantled treatment components to identify the most important mechanisms of change for patients with eating disorders. Therefore, the relative importance of behavioural interventions compared to other treatment components is currently poorly understood.

The value of behavioural strategies in reducing psychopathology in other disorders and the strong focus on behavioural strategies in effective therapies for eating disorders raises several important questions.

- Are behavioural strategies sufficient to drive the outcomes of evidence-based treatments for eating disorders?
- What are the key behavioural strategies that are necessary in treating eating disorders?
- By what mechanisms do behavioural strategies operate?

From the outset, it should be emphasized that definitive answers are not currently possible given the lack of true dismantling studies. It should also be stressed that behavioural interventions for eating disorders are not used simply to target eating disorder behaviours, but also have the implicit and explicit targets of creating other changes (e.g., modifying emotions and cognitions in CBT; modifying family interactions around the eating problems in FBT).

Given these questions and contextual factors in the literature, the present paper will:

1. Summarise the literature on purely behavioural approaches for eating disorders;
2. Identify key behavioural interventions in evidence-based treatments for eating disorders,
3. Consider the evidence regarding how those behavioural interventions work

Finally, we will consider some of the clinician-level obstacles to implementation of behavioural methods.

Do purely behavioural approaches work for eating disorders?

Behavioural strategies are commonly used in the treatment of eating disorders. For example, within inpatient units, operant conditioning techniques have been employed to

encourage patients with anorexia nervosa to eat and regain weight (5). In eating disorder inpatient units in Germany, experts report routinely using behavioural contracts in the management of anorexia nervosa (6-7) with the goal of motivating patients to gain weight by applying positive and negative consequences for the achievement or non-achievement of weight goals. The most frequently used positive consequences are the cessation of ward restriction (84%), hospital leave (83%) and the cessation of a liquid diet, while the most frequently used negative consequences were restriction to the ward (87%) and additional high caloric nutrients (70%). Experts rated behavioural contracts as highly effective, although there is currently no empirical research examining that effectiveness, and the high rates of relapse following discharge from hospital suggest that behavioural interventions in isolation may not be sufficient to deliver recovery or sustained remission in isolation.

Cue exposure (exposing the individual to the characteristics of the feared object, such as the smell or taste of a binge food) has also been used to address the urge to binge in routine clinical practice. For example, in a small sample of non-responders to pharmacological treatment or CBT, cue exposure was associated with almost complete cessation of binge-eating and vomiting behaviours in individuals with bulimia nervosa that was sustained at long-term follow-up (8). However, in routine practice, behavioural elements are usually integrated into a wider package of care, where their individual benefits cannot be assessed. Therefore, we will first focus on pure behaviour therapies for eating disorders. It will be noted that there is very little evidence relating to such interventions for children and adolescents, and almost nothing relating specifically to behaviour therapies for binge eating disorder or other atypical eating disorders in adulthood.

Behavioural therapy for bulimia nervosa

When considering the outcome of behavioural therapy (BT) in isolation, the earliest studies to consider are those of Freeman and Fairburn (9-11), though others have been published more recently. The core elements in BT for bulimia nervosa are detailed in Table 1.

Insert Table 1 about here

Fairburn compared BT to CBT and an interpersonal approach. Their behavioural approach is described as a "dismantled" form of CBT, focusing "exclusively on the normalization of eating habits" (10). In this therapy, the emphasis of the behaviour change was on:

- regaining control over eating;
- establishing a regular pattern of eating, and;
- ceasing to diet

While this purely behavioural approach, focused on normalization of eating habits, was associated with improvements by the end of therapy (10), the results for BT were weaker than those for CBT and the interpersonal intervention. BT had higher rates of attrition during the therapy and lower effectiveness than CBT in the short and longer term. By the end of the 6-year follow-up, BT was performing far less well than the other therapies - probably no better than spontaneous recovery levels would have explained. This finding suggests that BT in isolation may not be sufficient to change eating disorder behaviours.

A similar approach has been presented (12), based on dietary change (establishing a pattern of eating every three hours) and self-monitoring (recording food and drink intake, and frequency of bulimic behaviours). Their intervention was conducted over only four weeks, meaning that the effects were relatively small. However, it is noteworthy that the level of effect was substantially smaller than achieved by the first four weeks of CBT (13), suggesting that BT in isolation may be less effective in reducing symptoms of bulimia nervosa than therapies that combine behavioural and cognitive strategies. Another related behavioural approach to treating bulimia nervosa (nutrition, feedback on pacing of eating, and thermoregulation) is stated to have positive results (14). However, while a large number of patients have been treated using this approach, the substantial methodological problems in the studies (e.g., lack of control groups, non-replicability, handling of missing data, omission of very large numbers

of patients from the sample included in the analyses) mean that the evidence of outcomes is relatively weak. Thus, it appears that a nutrition-based behavioural intervention in isolation is of limited utility in treating bulimia nervosa.

In contrast, Freeman (9) described a form of BT for bulimia nervosa that was slightly broader than Fairburn's, as it incorporated graded tasks and relaxation training (i.e., systematic desensitization), as well as regularisation of eating and self-monitoring. Unlike Fairburn's outcomes (above), BT had very similar outcomes to those of CBT, and tended to have a lower attrition rate across the course of therapy. The loss to follow-up in this study means that one cannot conclude that the outcomes were sustained equally for all therapies. However, this study highlights the possibility that behavioural interventions that more thoroughly address long-standing fear-based learning might perform at least as well as CBT at post-treatment.

To summarise, in treating bulimia nervosa, behavioural strategies based primarily on nutritional changes are effective in the short-term, but are not sufficient to generate the level of remission and recovery that are found in CBT (see Agras, this edition). While it is likely that behavioural interventions focused on nutritional change and normalizing eating habits are necessary, it is possible that exposure-based elements or cognitive elements are also needed to enhance such nutritional elements.

Behavioural therapy for anorexia nervosa [2]

Table 1 shows the key studies of BT for anorexia nervosa, and the behavioural techniques involved. The first controlled study that examined the impact of purely behavioural approaches on anorexia nervosa compared the outcome of BT and CBT (15). Their behavioural approach included nutritional changes, using graded approach to feared foods combined with relaxation components (i.e., systematic desensitization, rather than the more effective approach of graded exposure). The outcomes for BT and CBT both tended to be positive relative to treatment as usual and were equivalent across the two therapies, even

[2] Because of the substantial methodological issues with the Bergh et al. paper (14), as outlined above, that study is not included in this review and does not contribute to the conclusions.

though attendance at BT was poorer. The conclusion reached was that adding cognitive elements to BT did not have measurable benefits for anorexia nervosa. However, the small sample size in each condition (n = 8) leaves the possibility that the lack of significant differences is attributable to low power. Further replication studies are needed to assess whether these results are generalizable. The authors also noted that the lack of significant differences between the cognitive-behavioural and behavioural treatments may be because directly manipulating cognitive processes using techniques such as cognitive restructuring is unnecessary since behavioural change is mediated by cognitive factors – that is, both treatments might work via the same mechanisms of change.

A second behavioural approach that has been employed successfully with adults with anorexia nervosa is SSCM (16). SSCM's only behavioural, action-based technique is focusing the patient on the need for weight gain and normalization of eating. Thus, the key behavioural method used is nutritional change, as with Fairburn's BT approach to bulimia nervosa (10-11). The value of the behavioural strategies within SSCM for anorexia nervosa is demonstrated by its outcomes with this clinical group. In a number of trials to date (17-21), SSCM has proven at least as effective as other therapies [including CBT, Maudsley Model of Anorexia Nervosa Treatment for Adults (MANTRA), and interpersonal psychotherapy (IPT)] in the treatment of anorexia nervosa (including atypical cases), in the short and longer term. Thus, it appears that SSCM is a behavioural approach that is at least as effective for anorexia nervosa as other interventions, such as CBT. However, it is important to note that the 'support with life issues' element of SSCM is less clearly defined (16), so it is possible that there are elements here that are not entirely behavioural.

To summarise, while outcomes across treatments are weaker for anorexia nervosa than they are for bulimia nervosa, behavioural approaches to AN appear to be as effective as broader approaches. The question that arises in consequence is whether we should be implementing more complex forms of therapy when BT may be at least as effective (and easier to deliver) than those other approaches.

Behavioural therapy for eating and feeding disorders of childhood and adolescence

The most strongly recommended treatments for children and adolescents with eating disorders are family based, though CBT can be used in some cases (1). While these approaches all include substantial focus on nutrition and behavioural change, they are embedded within wider systemic and cognitive approaches, making the behavioural element impossible to isolate. The literature on the use of behavioural therapy with these cases is also made harder to interpret as a result of inconsistent definitions used across the field (22). Changes in categorization have been operationalized under DSM-5 (23). However, the recency of that definitional change means that research into the treatment of the new categories is in its infancy. While there are some promising treatments in development for such cases (24), few are purely behavioural in nature.

Considering the evidence for such disorders under the less well-defined categories that preceded DSM-5, some behavioural strategies (e.g., nutritional change; stimulus control; extinction, contingency management) are effective in the treatment of young children with feeding disorders (25). Similarly, it has been suggested that exposure-based methods should be used for selective eating across the age span (26). However, the conclusions that can be reached about the role of behavioural therapy in younger cases are limited.

Summary

At present, the evidence for BT as an approach to eating disorders is limited, but suggests different responses according to the nature of the disorders. Behavioural methods (particularly focused on nutrition) might seem to be as effective as other therapies for anorexia nervosa. However, given that the literature has a number of limitations (e.g., lack of extended follow-up, high relapse rates post hospitalisation), it might be premature to suggest that BT is *sufficient* as a treatment for anorexia nervosa. The evidence is more mixed when considering treatment of bulimia nervosa, where it appears that simple nutritional change is *necessary but not sufficient* to effect positive, sustained outcomes, and that exposure techniques might be necessary to maximise the effects of nutritional change. It also appears that behavioural therapies are effective with some childhood eating disorders, but further research is needed to support that case, especially given recent diagnostic changes. However, this is only a small

part of the evidence regarding treatment of eating disorders, and many of the existing treatment packages for eating disorders contain substantial behavioural strategies. The key behavioural strategies that are commonly used in that way are outlined below.

Key behavioural strategies in the treatment of eating disorders

When considering behavioural elements in the evidence-based treatment of eating disorders, it should be remembered that those elements are most commonly found as components of full therapy protocols, such as CBT (27-28), FBT (29-30), SSCM (16), and MANTRA (31). The techniques are not always labeled as such within the specific therapy protocol, though they serve the functions outlined. The most important of those techniques are outlined in Table 2, along with examples of their use and whether they are found in different therapies. These techniques are used very differently across therapies, as outlined below.

Insert Table 2 about here

Normalizing eating patterns and weight

The majority of evidence-based therapies for eating disorders stress nutritional change as necessary, but they differ in the timing of change. For example, in underweight cases, Fairburn stresses nutritional behavior change as an early focus in CBT-enhanced for non-underweight and underweight patients, but only emphasizes the need for weight gain later (27). In contrast, Waller et al. (13,28) emphasize the need for nutritional behaviour change and weight regain from the outset, regardless of diagnosis. Similarly, nutritional change is described as a target from the outset in MANTRA for anorexia nervosa (31). However, in all of these approaches, changing eating structure and content to ensure weight gain and weight maintenance are stressed as key skills.

Skills training

The development and implementation of practical skills can assist patients who have

a long history of an eating disorder and a consequent loss of self-esteem and confidence. The development of such skills is a central part of all the evidence-based therapies considered here (e.g., the parental skills needed to manage behavioural change in FBT; the practical skills of planning, shopping, and food preparation that are stressed in SSCM). The support of a wide range of professionals (e.g., dietitians, occupational therapists) can be valuable here.

Exposure and avoidance of safety behaviours

Exposure is a core element of CBT-ED and BT, though it is not always explicitly detailed in the relevant protocols. However, the changes to eating that are stressed in other effective therapies mean that exposure takes place there, too. In CBT-ED and BT, such exposure is used to reduce anxiety and fear. Through sustained exposure to the feared object (e.g., food; seeing one's body), the individual learns that the feared negative outcome (e.g., weight gain) does not occur. As well as changes in eating patterns, exposure is used to address other important maintaining factors such as body avoidance, binge eating, purging, and avoidance of being weighed.

While most exposure is delivered using a habituation paradigm (using hierarchy-based methods), developments in the anxiety literature suggest that this approach is not as effective as an approach based on inhibitory learning (32). Consequently, it has been suggested that inhibitory learning should be used to underpin the use of exposure in working with eating disorders (33). Such a goal means that clinicians should aim to ensure that the patient's anxiety is maximized (rather than increased slowly between sessions, using a hierarchy), and that the exposure should be practiced in as wide a range of settings as possible, to maximize and deepen the patient's learning. To date, this approach has only been reported in one form of CBT-ED (13,34), but that brief CBT-ED (CBT-T) has demonstrated promisingly rapid results that are sustained to follow-up. The form of exposure to be used in future versions of CBT-ED and other therapies merits consideration.

Behavioural experiments

This technique addresses cognitive distortions and errors, and is exclusive to CBT-ED. Behavioural experiments are more commonly used later in therapy, as it can be important to

reduce anxiety levels before the individual can reliably make a single change in order to learn its consequences. However, experiments can be set up earlier in CBT-ED, to help patients learn that their weight does not increase uncontrollably, as per their belief (35). Behavioural experiments are used in different ways in the different forms of CBT-ED. For example:

- Fairburn (27) stresses the use of such experiments to:
    - modify beliefs related to self-esteem and perfectionism
- Waller et al. (28) also use such experiments in order to:
    - correct specific beliefs about the impact on weight of changes in energy balance (e.g., introducing specific foods, changing exercise levels);
    - reduce body-related behaviours (particularly checking and comparison)
- Waller et al. (36) have recently suggested that clinicians should aim to maximize the level and speed of learning for patients by raising their anxiety prior to making predictions (e.g., discussing eating patterns in depth immediately before predicting weight gain), so that the patient's predictions can be shown to be more incorrect.

Mechanisms underlying the effects of behavioural interventions for eating disorders

The evidence outlined above makes a clear case that behavioural techniques are necessary for the effective treatment of eating disorders and their different symptoms. However, it should be stressed that the mechanisms of change are not always clear. Behavioural experiments are usually assumed to operate by changing cognitions (37), but it is also possible that there is a mood-change element. Similarly, exposure is assumed to be a method for reducing affect, but there is likely to be cognitive change too. Despite its very long history, we are still not clear about how exposure works, with long-standing suggestions including habituation and extinction, and more recent explanations centering on inhibitory learning processes (33). What is more clear is that the behavioural changes relating to nutritional balance have their widespread impact via enhancing mood stability and positive affect, cognitive flexibility, biological safety, and interpersonal/social functioning (38-39). However, these changes are likely to be complex and interactive, rather than distinct,

explaining the extent of the effects of nutritional balance.

Even though the learning and biological mechanisms of behavioural change are not always clearly understood, a key feature of behavioural strategies is their transparency. These methods are highly observable, discrete, and focused, so the therapist and the patient can clearly observe their impact. That transparency of effect means that learning can be maximized, with clear causality established. When the patient learns the effect of behavioural change, they can learn to change their everyday behaviours in an adaptive way: when the therapist learns the effect of behavioural change, they can carry it over to future patients with greater confidence.

A caveat: The role of the clinician in the delivery of behavioural methods

While the evidence above clearly shows that behavioural methods have a necessary role in the treatment of eating disorders, it is important to remember that no therapy has the potential to help our patients if we do not use it. With that in mind, it is important to remember that clinicians rarely use treatment protocols in the field of eating disorders (40-41) and report relatively low use of key behavioural methods. For example, clinicians who report that they use CBT for eating disorders describe using structured eating regularly with only about half of their patients, and using behavioural experiments and exposure with only about a third (42-43). This failure to use behavioural methods is not confined to CBT-ED, as shown by the reported reluctance of clinicians to employ nutritional change and other key methods in SSCM, MANTRA and FBT (16,31,44). Possibly more worrying is the fact that clinician's own anxiety levels are predictive of whether they will employ structured eating, exposure and weighing (42-43,45). This impact of clinician anxiety is known outside of the field of eating disorders, and has resulted in the suggestion that clinicians' own anxiety levels should be addressed in supervision, using role play.

Conclusions

In treating eating disorders, it is clear that:

- We do not have the necessary dismantling studies to demonstrate which elements are critical in explaining the outcomes of our effective therapies
- Behavioural components are definitely necessary, across therapies and diagnoses, in order to get the strongest outcomes
- In anorexia nervosa, the central behavioural strategy of nutritional change appears to be the most important aspect of evidence-based treatments
- A range of behavioural techniques are valuable in the treatment of eating disorders. However, while they are inherent in some techniques used in other evidence-based therapies, they are more overtly planned into CBT-ED and BT.
- Even within CBT-ED, the methods are used differently, reflecting disparate models.
- Despite their being key to CBT-ED and other therapies, clinicians do not always use behavioural methods, and are less likely to do so in response to their own anxiety levels.

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Table 1

Elements of behavioural therapy, as used to treat bulimia nervosa and anorexia nervosa

		Element of intervention			**Measurement point**	
	Type of therapy	Regularise eating	Monitoring eating	Systematic desensitization	Effective by end of therapy?	Effective at follow-up?
Bulimia nervosa						
Freeman et al.	BT	■	■	■	++	Not known
Fairburn et al.	BT	■			++	-
Barakat et al.	Dietary change (4 weeks)	■	■		+	Not known
Anorexia nervosa						
Channon et al.	BT	■	■	■	++	++
McIntosh et al.	SSCM	■	■		++	++

Table 2

Core behavioural techniques used in evidence-based therapies

Behavioural technique	**Examples of general roles**	**Found in**
Change in eating patterns	• Enhances flexible thinking • Mood stabilization • Weight regain and stabilization	• FBT • CBT-ED • MANTRA • SSCM • BT
Exposure with response prevention	• Reduce anxiety • Reduce avoidant behaviours (e.g., restriction; not using mirrors) • Reduce safety behaviours (e.g., bingeing to block emotional states; vomiting to avoid feared weight gain)	• CBT-ED • MANTRA • BT (some)
Behavioural experiments	• Testing and changing cognitions • Reduces beliefs about the uncontrollability of weight gain • Reduces belief in value of body checking and comparison • Enhancement of self-esteem • Reduction in beliefs about the value of perfectionist style	• CBT-ED
Behavioural skills training	• Meal planning • Parental management skills	• FBT • CBT-ED • BT • SSCM