

# Behavioral Treatments for Human Obesity

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Gary D. Foster, PhD, and Alexis Wojtanowski  
Center for Obesity Research and Education  
Temple University  
Email: gfooster@temple.edu

## Purpose

The purpose of this manuscript is to describe the behavioral treatment for obesity, its principles and practices, defining characteristics and outcomes.

## Background and Philosophy

Historically, behavioral treatment of obesity developed from the belief that obesity was the result of maladaptive eating and exercise habits, which could be corrected by the application of learning principles.<sup>1</sup> It is now widely recognized that body weight is affected by factors other than behavior. These include genetic, metabolic and hormonal influences<sup>2-4</sup> that probably predispose some people to obesity and may well set the range of possible weights that an individual can achieve. Some individuals may never be thin, despite Herculean efforts to modify eating and activity habits. Behavior therapy, however, can help such individuals develop a set of skills (such as eating a low-calorie diet) to achieve a healthier weight, even if they cannot attain an ideal one.

## Principles and Practices

Behavioral treatment is based primarily on principles of classical conditioning, which posit that eating is often prompted by antecedent events (i.e., cues) that become strongly linked to food intake.<sup>1</sup> Behavioral treatment, as described below, helps patients identify cues that trigger inappropriate eating (and activity) and learn new responses.<sup>5,6</sup> Treatment also seeks to reinforce (or reward) the adoption of positive behaviors. While the reinforcement of positive behaviors (operant conditioning) is a reasonable strategy, it can be challenging when trying to modify targets (sedentary behavior, consumption of highly palatable, energy dense foods) that are immediately and specifically reinforcing. The dilemma is that the very behaviors we are attempting to decrease (consuming a delectable dessert, hitting the snooze button) are much more reinforcing in the short term than the behaviors we are attempting to increase (choosing a low-calorie dessert or getting up early to be physically active). Therefore, many behavioral approaches use strategies based on classical conditioning. This approach involves disconnecting cues on antecedents (times, places,

activities, emotions and people) from unwanted behaviors.

In the past 20 years, cognitive therapy also has been incorporated in the behavioral treatment of obesity. The underlying assumption of cognitive therapy is that thoughts (or cognitions) directly affect feelings and behaviors.<sup>7</sup> Negative thoughts frequently are associated with negative outcomes, as in the case of an individual who overeats and thinks, "I've blown my diet," and then proceeds to eat even more secondary to feelings of failure and hopelessness. With cognitive techniques, patients learn to set realistic goals for weight and behavior changes, to realistically evaluate their progress in modifying eating and activity habits, and to correct irrational, often negative thoughts that occur when they do not meet their goals.<sup>8-10</sup> Cognitive interventions for weight management<sup>11-13</sup> are based on those developed for the treatments of depression, anxiety and bulimia nervosa.

## Characteristics of Behavioral Treatment

Behavioral treatment has several distinguishing characteristics.<sup>14</sup> First, it is goal-directed. It specifies very clear goals in terms that can be easily measured. This is true whether the goal is walking four times per week, lengthening meal duration by 10 minutes or decreasing the number of self-critical comments. Specific goals facilitate a clear assessment of success.

Second, treatment is process-oriented. It is more than helping people to decide what to change (i.e., eating, activity and thinking habits); it is helping them identify how to change.<sup>9</sup> Thus, once a goal is specified, patients are encouraged to examine factors that will facilitate or hinder goal achievement. In cases in which the desired behavior is not implemented, problem-solving skills are used to identify new strategies to overcome barriers. In this view, successful weight management is based on skills that can be learned and practiced in the same manner that an individual can learn to play the piano through frequent practice. Skill power, not willpower, is the key to success.

Third, the behavioral approach advocates small rather than large changes. This is based on the learning principle of successive approximation in which incremental steps are taken to achieve more distant goals. Making small

changes gives patients successful experiences on which to build rather than attempting drastic changes that are typically short-lived.<sup>15</sup>

The behavior change process is facilitated through the use of a variety of problem-solving tools. The behavior chain, an illustration that visually depicts the chain of events that lead to an unwanted behavior such as overeating, is one of the tools commonly used in treatment (Figure 1). By examining the cues and events that lead up to an overeating episode, one can identify areas in which modifications in behavior can be made to break the chain of events and prevent an overeating episode from occurring. For example, if a patient has identified television watching as part of the sequence of events leading up to an overeating episode, limiting eating to a more appropriate location (i.e., table in the kitchen or dining room) can be an effective strategy for weakening the association between eating and television watching. The more often the patient refrains from eating in front of the television, the less likely that television watching will automatically trigger eating (i.e., extinction).

### The Behavioral Package

Behavioral treatment usually includes multiple components, such as keeping food and activity records (i.e., self-monitoring), controlling cues associated with eating (i.e., stimulus control), nutrition education, slowing eating, physical activity, problem solving, and cognitive restructuring (i.e., cognitive therapy).<sup>5,6</sup> These components comprise the “behavioral package” that has been summarized in manuals such as the “LEARN Program for Weight Management 2000.”<sup>8</sup> Studies have shown that two components, self-monitoring<sup>16,17</sup> and physical activity,<sup>18,19</sup> are consistently associated with better weight control in the short term and long term, respectively. Additional research is needed to identify the most potent components of the package, as well as additional interventions that might be added (such as body image therapy) to improve efficacy, especially in the long term. In the interim, researchers and practitioners probably will

continue to use the behavioral package because it is well-validated, as a whole, and different patients are drawn to different components of the intervention.

### Short-Term Results of Behavioral Treatment

A large number of clinical studies have been conducted examining the effects of behavioral treatment on weight loss. The typical design of most behavioral treatment weight-loss studies is group meetings weekly for the initial treatment phase (≈3 to 6 months), biweekly (every other week) for the maintenance phase (6 to 2 months), and monthly or bimonthly for the later phases of the study (12 to 24 months).<sup>20,21</sup>

Wing et al.<sup>22</sup> reviewed behavioral weight-loss studies from 1996 to 1999, which resulted in a mean short-term weight loss of 10.6% (9.6 kg) during the treatment phase (21 weeks) and 8.6% (6.0 kg) at follow up (18 months). Studies over the last decade have produced roughly similar results.<sup>21,23-25</sup>

### Outcomes for Behavioral Treatment

Although behavioral treatment provides individuals with a set of skills to handle barriers to eating healthy and being active, overcoming barriers is a difficult endeavor in a fast-paced environment that encourages overconsumption of energy-dense, palatable, low-cost foods and promotes energy-saving devices.<sup>26,27</sup> A healthy lifestyle requires significant planning, proficiency in making healthy choices and estimating portion sizes, and diligence in monitoring caloric intake and activity, all which take time to develop and maintain. As such, strategies for simplifying and making this process more practical have been investigated and are described below. In general, these strategies provide structure and reduce time spent in meal planning and decision making.

### Food Provision

Jeffery et al.<sup>28</sup> examined the impact of food provision on weight loss outcome in 202 overweight individuals. Participants who received food along with standard behavioral treatment lost more weight at 6 months (-10.1 vs -7.7 kg), 12 months (-9.1 vs -4.5 kg) and 18 months (-6.4 vs -4.1 kg) than those who were prescribed a reduced calorie diet and standard behavioral treatment. In a subsequent study, Wing et al.<sup>29</sup> sought to determine whether food provision itself or limited dietary decision making affected weight loss outcome. In this study, 163 overweight women were randomly assigned to one of four interventions: 1) standard behavioral treatment; 2) standard behavioral treatment plus written meal plans and grocery lists for five breakfasts and dinners each week; 3) standard behavioral treatment plus foods for a charge of \$25/week; and 4) standard behavioral treatment plus foods free of

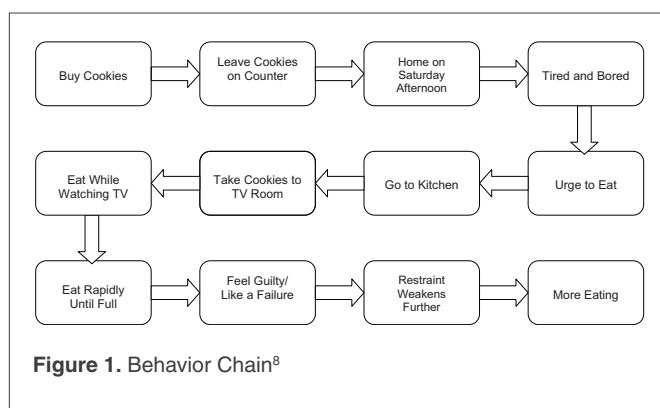


Figure 1. Behavior Chain<sup>8</sup>

charge. Data were collected for 90% of participants at the end of active treatment (i.e., 6 months) and at 1-year follow-up (i.e., 18 months after randomization). Weight loss was greater in groups that received food and meal plans compared with the group that received standard behavioral treatment at 6 and 18 months; however, no differences in weight loss were observed between the groups that were provided food and the group that received meal plans and grocery lists.

### **Meal Replacements**

Similar findings are observed in studies that compared meal replacements<sup>30-32</sup> or prepackaged entrees<sup>33,34</sup> with self-selected diets. These studies suggested that replacing two of three meals with a liquid and/or solid meal replacement or at least two meals with a portion-controlled entrée resulted in greater weight loss than self-selected diets. Although some weight regain was observed over time, a greater reduction in weight was observed even up to 4 years in individuals receiving meal replacements.<sup>30</sup> Based on a meta-analysis by Heymsfield et al.,<sup>35</sup> individuals consuming meal replacements lose  $\approx 7\%$  to  $8\%$  body weight, whereas those on a standard self-selected diet lose  $3\%$  to  $7\%$  body weight at 1 year. It is unclear whether meal replacements are superior to other structured weight loss approaches that provide menus and recipes, however Noakes et al.<sup>36</sup> found similar decreases in weight in individuals using meal replacements ( $-9.0$  kg or  $-9.4\%$  body weight) and those following structured diets ( $-9.2$  kg or  $-9.3\%$  body weight) at 6 months. These findings suggest that increasing structure may improve dietary compliance.

### **Pharmacotherapy**

Another method used to enhance weight loss outcomes is to couple behavioral and pharmacotherapy approaches. It can be argued that behavioral treatment modifies the external environment, whereas pharmacologic approaches modify the internal environment either centrally (i.e., phentermine) or peripherally (i.e., orlistat). To test this hypothesis, Wadden et al.<sup>37</sup> compared weight loss in 224 obese adults randomly assigned to one of four groups: 1) 15 mg of sibutramine alone, given by a primary care provider in eight visits of about 10 minutes; 2) 30 group lifestyle-modification counseling sessions; 3) sibutramine plus 30 group lifestyle-modification counseling sessions (i.e., combined therapy); or 4) sibutramine plus brief lifestyle-modification counseling delivered by a primary care provider in eight visits of 10 minutes each. All subjects followed a calorie-controlled diet of 1,200 to 1,500 kcal per day with a weekly exercise regimen. After one year, subjects who received combined therapy had significantly greater weight losses than all other groups.

These data suggest that the combination of medication and group lifestyle modification resulted in more weight loss than either lifestyle modification or medication alone. These findings may highlight the importance of combining weight-loss medications and lifestyle modification.

### **Commercial Weight Loss Programs**

Most research on behavior treatment has been conducted in university-based clinic programs. Although such studies are important, they tell us little about the effectiveness of these approaches in settings outside specialized clinics. Womble et al.<sup>38</sup> reviewed the available literature on commercial approaches and found, in general, that weight losses were less than those observed in the clinical setting. In a study that evaluated the effectiveness of the Weight Watchers program, Heshka et al.<sup>39</sup> found that those in Weight Watchers lost more weight than those assigned to a self-help group after 1 year ( $4.6\%$  vs.  $1.7\%$ ) and after 2 years ( $3.1\%$  vs.  $0.2\%$ ). A recent, short-term study<sup>40</sup> assessed the effects of a commercial weight loss program on weight and glycemic control among obese patients with type 2 diabetes. The study compared a portion controlled diet (PCD), Nutrisystem<sup>®</sup>D<sup>™</sup>, plan to a traditional diabetes support and education (DSE) program. After three months, those in the PCD group lost significantly more weight than the DSE group ( $7.1 \pm 4\%$  vs.  $0.4 \pm 2.3\%$ ;  $p < 0.0001$ ). Those in the PCD group had significantly greater reductions in HbA1C than the DSE group ( $-0.88 \pm 1.1$  vs.  $0.03 \pm 1.09$ ;  $p < 0.001$ ).

### **Counseling Skills**

Although behavioral change is the responsibility of the patient, it is the responsibility of the health care provider to facilitate change through effective counseling.<sup>41</sup> Counseling is not an innate talent; it requires practice and fine-tuning. Many providers may feel that their primary role is to give advice to patients about healthy methods of weight control. Although some education and advice is useful, most weight control patients are well aware of what they “should” eat; the problem is doing so in an environment that encourages otherwise. Therefore, an emphasis on asking questions to clarify barriers and provide solutions is more effective than giving advice about how to “fix” the problem. The former approach models for patients the manner in which a problem can be managed effectively rather than depending on getting the right advice. As a rough indicator, the more a clinician speaks during the session, the less effective the session will be for the patient. If the clinician is talking  $>50\%$  of the session, it is important to reassess the balance between advice giving and problem solving.<sup>41</sup>

## Weight Maintenance

One of the main challenges in weight loss of overweight or obese people is how to maintain the weight loss. Approximately one-third of the weight that was lost is often regained within the first year after treatment, and more weight is regained over time.<sup>42</sup> Recent literature reviews propose that weight-loss maintenance may be improved by the following methods: drug therapy with either orlistat or sibutramine in combination with lifestyle modification, caffeine or protein supplementation, consumption of a low-fat diet, commitment to physical activity regimens, continued contact with participants, problem-solving therapy, and even alternative treatments (i.e., acupuncture).<sup>43</sup> The recent data, reported by Wing et al., support that self-regulation models incorporating regular weighing can be useful for facilitating weight loss maintenance. Despite these positive signals, it is important to note that the most frequent outcome of weight-loss treatment is weight regain.

## Future Directions

Health care providers can provide a great service to obese patients by reminding them that their worth is not measured on the scale. Patients should be encouraged to take themselves, their health and thus their weight seriously rather than attempting to lose weight so they can like themselves. Reaffirming the patient's self-worth, independent of body weight, is perhaps one of the most powerful interventions a health care provider can provide an obese patient. As Stunkard<sup>44</sup> suggests, "As with any chronic illness, we rarely have an opportunity to cure, but we do have an opportunity to treat the patient with respect. Such an experience may be the greatest gift that [we] can give an obese patient."

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