



Effect of dose of behavioral treatment for obesity on binge eating severity



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ABSTRACT

Objectives: We evaluated the effects of three doses of a behavioral intervention for obesity (High dose = 24 sessions, Moderate = 16 sessions, Low = 8 sessions) compared with a nutrition education control group (Control) on binge eating. We also examined whether participants with clinically significant improvements in binge eating had better treatment adherence and weight-loss outcomes than those who did not experience clinically significant improvements in binge eating. Finally, we examined the relation of pretreatment binge eating severity to changes at six months.

Methods: Participants included 572 adults (female = 78.7%; baseline mean \pm SD: age = 52.7 \pm 11.2 years, BMI = 36.4 \pm 3.9 kg/m²) who provided binge eating data at baseline. We evaluated binge eating severity (assessed via the *Binge Eating Scale*) and weight status at baseline and six months, as well as treatment adherence over six months.

Results: At six months, participants in the Moderate and High treatment conditions reported greater reductions in binge eating severity than participants in the Low and Control conditions, $ps < .02$. Participants who demonstrated improvements in binge eating severity reported greater dietary self-monitoring adherence and attained larger weight losses than those who did not experience clinically significant reductions, $ps < .001$. Pretreatment binge eating severity predicted less improvement in binge eating severity over six months and fewer days with dietary self-monitoring records completed, $ps \leq .002$.

Conclusion: A moderate or high dose of behavioral weight-loss treatment may be required to produce clinically significant reductions in binge eating severity in adults with obesity.

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1. Introduction

Binge eating – generally defined as consuming what is perceived as a large amount of food within a discrete period of time accompanied by a loss of control and negative feelings such as disgust, shame, and guilt – is common among adults seeking obesity treatment (Hudson, Hiripi, Pope, & Kessler, 2007; Klatzkin, Gaffney, Cyrus, Bigus, & Brownley, 2015). While eating large amounts of food in one sitting is not unusual in the United States, binge eating is a distinct behavioral pattern associated with distress and loss of control, and Binge Eating Disorder (BED) is a clinical diagnosis with specific requirements regarding the period of time during which the food is eaten and the frequency of the binge eating behaviors (American Psychiatric Association, 2013). Previous studies have found that as many as 55% of adults seeking weight-management treatment for obesity report episodes of binge eating (de Zwaan, 2001; Gormally, Black, Daston, & Rardin, 1982; Linde et al., 2004). Estimates of lifetime prevalence of BED in the United States

range from 2.0%–3.5% (Hudson et al., 2007; Kessler et al., 2013), yet 20%–30% of treatment-seeking adults with obesity meet full criteria for BED (Hudson et al., 2007; Spitzer et al., 1992; Striegel-Moore & Franko, 2008) and adults who meet diagnostic criteria for BED are more likely to have a Body Mass Index (BMI) in the obese range than those without a history of eating disorders (Pike, Dohm, Striegel-Moore, Wilfley, & Fairburn, 2001). However, there is currently limited research on the effects of behavioral weight-loss treatment on binge eating and the dose of treatment needed to produce significant reductions in binge eating severity. In the current study, we evaluated the effect of three doses of a behavioral weight-loss intervention on binge eating symptom severity in obese adults.

Evidence is mixed regarding whether behavioral weight-loss interventions for obesity can reduce participants' binge eating symptom severity. Some previous studies suggest that behavioral weight-management interventions are less effective at reducing symptoms of binge eating than cognitive behavioral therapy (CBT) and other specialized treatments for BED but more effective at inducing weight loss (Berkman et al., 2015; Iacovino, Gredysa, Altman, & Wilfley, 2012; Vocks et al., 2010; Wilson, Wilfley, Agras, & Bryson, 2010; Wilson, 2011). However, Grilo, Masheb, Wilson, Gueorguieva, and White (2011) found that CBT induced significantly greater reductions in BED symptoms up to 12-months than behavioral weight-loss treatment,

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yet both treatment options were effective; 51% of participants receiving CBT, 36% of participants receiving behavioral weight-loss treatment, and 40% of participants receiving both CBT and behavioral weight-loss treatment experienced remission from BED. Additionally, [Munich et al. \(2007\)](#) found that the superior posttreatment effect of CBT over a behavioral weight-loss intervention in treating BED diminished at the 12-month follow-up. Given these conflicting findings, further research is warranted regarding the effectiveness of behavioral weight-loss interventions for adults with symptoms of binge eating.

To our knowledge, there is no research on the effect of different doses of a behavioral weight loss treatment on binge eating severity. While several studies have found that 16 sessions of a weight-loss program for obese adults are associated with significant reductions in binge eating severity over six months (e.g., [Devlin, Goldfein, Petkova, Liu, & Walsh, 2007](#); [Grilo et al., 2011](#)), none has specifically compared treatment doses to identify a threshold dose that can elicit clinically meaningful improvements.

Currently, there is also no empirical consensus on whether obese individuals who binge eat experience greater difficulties with treatment adherence or achieve poorer weight-loss outcomes in behavioral weight-loss treatments than their non-binge eating counterparts. Several studies have found that individuals who binge eat are more likely to drop out of a standard weight management intervention for obesity (e.g., [Goode et al., 2016](#); [Moroshko, Brennan, & O'Brien, 2011](#); [Teixeira, Going, Sardinha, & Lohman, 2005](#)) and achieve poorer weight-loss outcomes (e.g., [Gorin et al., 2008](#); [Masheb et al., 2015](#)). While other studies have failed to find a relationship between pretreatment binge eating and either dietary self-monitoring adherence or weight-loss outcomes (e.g., [de Zwaan, 2001](#); [Raymond, de Zwaan, Mitchell, Ackard, & Thuras, 2002](#); [Stunkard & Allison, 2003](#)), there are data to suggest that improvements in uncontrolled eating are associated with better weight loss outcomes and treatment adherence in adults with obesity (e.g., [Nurkkala et al., 2015](#); [Keränen et al., 2009](#); [Wilson et al., 2010](#)).

1.1. Current study aims

The primary aim of the present study was to evaluate the impact of three doses of behavioral treatment for obesity compared with a nutrition education control group on participants' self-reported symptoms of binge eating. A secondary aim of the current study was to determine whether participants who experienced clinically significant improvements in binge eating symptoms had better treatment adherence and larger weight losses than those who did not report improvements. As a third aim, this study examined the relation of pretreatment binge eating severity to changes in binge eating severity, treatment adherence, and weight outcomes at six months.

1.2. Hypotheses

Given that longer treatment should afford participants' greater opportunities to acquire the skills to manage binge eating, we hypothesized that participants in the High dose treatment condition would report greater reductions in binge eating behaviors over six months than participants in the Low dose and Control conditions. We further hypothesized that participants who reported clinically meaningful improvements in binge eating severity would have greater treatment adherence (i.e., completion of dietary self-monitoring records and treatment session attendance) and weight loss than those who did not report clinically meaningful improvements. Additionally, we hypothesized that greater pretreatment binge eating severity would predict less improvement in binge eating severity, lower treatment adherence, and smaller weight losses over six months.

2. Methods

2.1. Participants

Participants in the current study included 572 of the 612 men and women (ages 21–75) with obesity who volunteered to take part in a study examining the effects of three doses of a group lifestyle intervention on weight outcomes; the 40 participants who did not complete the *Binge Eating Scale* at baseline were excluded from the analyses. Participants were required to have a baseline BMI (kg/m^2) ≥ 30 and ≤ 45 and live in one of ten rural counties in northern Florida. Eligible participants were free of uncontrolled medical conditions (e.g., hypertension and diabetes). The use of medications known to affect body weight, a net weight change ≥ 4.5 kg in the preceding six months, musculoskeletal conditions that impede walking for 30 min, psychosocial conditions such as substance abuse, and clinically significant depression were similarly exclusionary (see [Perri et al., 2014](#) for a detailed description of eligibility requirements, recruitment and screening procedures, and treatment content). Participants in the current study were not required to endorse symptoms of binge eating or meet criteria for BED.

2.2. Content and doses of treatment

Participants attended weekly in-person meetings in groups of 6–15 women and men for up to six months. Eligible participants were randomized into one of the four study conditions: High dose behavioral treatment (HIGH = 24 weekly sessions), moderate dose behavioral treatment (MOD = 16 weekly sessions), low dose behavioral treatment (LOW = 8 weekly sessions), and a nutrition education control group (CONTROL = 8 weekly sessions). The intervention in the HIGH, MOD, and LOW dose lifestyle treatments were modeled after the Diabetes Prevention Program ([Diabetes Prevention Program Research Group, 2002](#)) and focused on implementing a low-calorie diet (e.g., 1200 kcal/day), increasing physical activity (e.g., additional 30 min of walking), and utilizing behavior change strategies (e.g., goal setting, written self-monitoring of food and drink intake, stimulus control, cognitive restructuring) aimed at creating a negative energy balance. Intervention content and accompanying written materials provided to participants were the same for LOW, MOD, and HIGH, but the time available for discussion varied according to the dose of treatment. The nutrition education condition (CONTROL) served as a control for staff attention and for delivery of information relevant to weight management.

2.3. Measures

Measures in this study were administered at baseline and six months. Given the differing doses of treatment, the assessment at six months is not synonymous with posttreatment (e.g., HIGH dose treatment lasted six months, MOD lasted four months, and LOW and CONTROL lasted two months).

2.3.1. Binge eating severity

In the current study, specific diagnostic criteria for BED were not formally assessed. Rather, the *Binge Eating Scale* (BES; [Gormally et al., 1982](#)) was used to assess binge eating symptomatology and behaviors. The BES is a self-report measure created using a sample of treatment-seeking obese adults. Each question on the BES provides three or four options of increasing severity regarding participants' eating behaviors and cognitions. Scores ranging from 0–46 reflect a sum of 16 questions, with higher scores indicating more severe binge eating. The BES also classifies participants based upon their scores into clinically meaningful categories: Mild/No Binge Eating (0–17), Moderate Binge Eating (18–26), and Severe Binge Eating (27–46). The major differences between those with Moderate and Severe Binge Eating were identified as the degree and frequency of self-control over eating urges and the severity of the emotional consequences of overeating. In previous studies,

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