



# Dieting in bulimia nervosa is associated with increased food restriction and psychopathology but decreased binge eating



Michael R. Lowe<sup>a,b,\*</sup>, Ashley A. Witt<sup>a</sup>, Stephanie L. Grossman<sup>a</sup>

<sup>a</sup> Department of Psychology, Drexel University, Mail Stop 626, 245 North 15th St., Philadelphia, PA 19102, United States

<sup>b</sup> The Renfrew Center for Eating Disorders, Philadelphia, PA, United States

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## ABSTRACT

The cognitive behavioral model of bulimia nervosa (BN) suggests that dieting is central to the maintenance of binge eating. However, correlational and experimental studies suggest that additional clarification is needed about the nature of this relationship. Dieting, weight, eating disorder psychopathology, and depression were assessed at admission among 166 patients with BN presenting for residential treatment. As in past research, a significant fraction (43%) of patients with BN reported not currently dieting. A comparison of weight loss dieters and non-dieters found greater food restriction and eating disorder psychopathology among weight loss dieters. However, dieters reported less frequent binge eating. There were no significant group differences in depression. Results suggest that 1) while many individuals with BN are attempting to restrict their food intake, the goal of losing weight fundamentally alters the effect of such restriction on binge eating, and 2) treatment may benefit from helping patients to establish a healthier approach to achieving long-term weight stability.

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## 1. Introduction

Bulimia nervosa (BN) is a serious disorder characterized by a pattern of binge eating and inappropriate compensatory behavior as well as an overemphasis on body weight and shape in self-evaluation (American Psychiatric Association, 2000). Cognitive behavioral therapy (CBT) is regarded as the gold-standard of empirically-based treatments for BN (Shapiro, Berkman, Brownley, Sedway, & Bulik, 2007), but incomplete response and relapse are major concerns (Keel, Mitchell, Miller, Davis, & Crow, 1999; Wilson, Grilo, & Vitousek, 2007). An improved understanding of the maintenance of the disorder is therefore crucial. Dieting is thought to be an important maintenance factor, but conflicting findings have been reported on the relation of dieting and binge eating. The purpose of the present paper is to re-examine the role of dieting in BN and to investigate the relation of different motivations for dieting (e.g., weight loss versus avoidance of weight gain) to psychopathology and eating disorder behaviors.

### 1.1. Dieting and BN

#### 1.1.1. Theory

In the cognitive-behavioral model of BN, dietary restraint is thought to play a central role in the maintenance of the disorder and is a primary

*Abbreviations:* AN, Anorexia Nervosa; BN, Bulimia Nervosa; CBT, Cognitive behavioral therapy; DLW, dieting to lose weight; DAG, dieting to avoid weight gain; ND, not dieting.

\* Corresponding author at: Dept. of Psychology, Drexel University, Mail Stop 626, 245 N. 15th St., Philadelphia, PA 19102-1192, United States. Tel.: +1 215 762 6508; fax: +1 215 762 7441.

E-mail address: ml42@drexel.edu (M.R. Lowe).

treatment target (Fairburn, 2008; Wilson, Fairburn, & Agras, 1997). CBT targets three types of dietary restraint: 1) avoidance of eating for long periods of time, 2) rigid avoidance of certain types of food, and 3) extreme restriction of the total amount of food consumed. Dietary restraint is assumed to be motivated both by concern about shape and weight and by the desire to compensate for instances of perceived or actual overeating (American Psychiatric Association, 2000). Dietary restraint is the most proximal cause of binge eating in the CBT model, and could be hypothesized to drive binge eating either in the short term (e.g., food restriction leading to intense feelings of deprivation and binge eating later in the day) or over the long term (e.g., diagnostic crossover from anorexia nervosa (AN) restricting type to AN binge purge type or BN). Consistent with this model, the reduction of dietary restraint partially mediates the reduction in binge eating and purging produced by CBT (Wilson, Fairburn, Agras, Walsh, & Kraemer, 2002). In addition, a recent ecological momentary assessment study, in which women with BN provided information on binge eating at multiple points throughout the day, found that greater restriction was associated with increased likelihood of binge eating on the same day and on the following day (Zunker et al., 2011).

#### 1.1.2. Dieting and restrained eating in non-clinical samples

Based on research in non-clinical populations, Lowe and colleagues suggested that restrained eating aimed at avoiding weight gain and dieting with the intention of losing weight are distinct dimensions associated with different effects on eating (Lowe, 1993; Lowe & Levine, 2005). This distinction is based in part on a series of studies (e.g., Stice, Sysko, Roberto, & Allison, 2010) that have shown that restrained eaters, defined by any of several measures of restrained eating, do not naturalistically

eat less than unrestrained eaters, suggesting that their food restriction may prevent weight gain but is insufficient to induce weight loss. In contrast to restrained eating, current dieting with the intention of losing weight is reliably associated with decreased rather than increased overeating and binge eating (Lowe & Kral, 2006). The reason for the divergent eating patterns between restrained eaters and those on diets to lose weight is not known, although cognitive weight-loss intentions may play an important role. Nonetheless, in laboratory studies, current dieters have been found to eat less (while restrained nondieters ate more) following a high-calorie preload (Lowe, 1995; Lowe, Whitlow, & Bellwoar, 1991). Another study found that inducing impulsivity led to increased eating in restrained and unrestrained nondieters, but not among participants currently dieting to lose weight (Guerrieri, Nederkoorn, Schrooten, Martijn, & Jansen, 2009). A prospective study comparing adolescents who were successfully restricting their eating (i.e., losing weight) to those with similar self-reported dietary restraint who were unsuccessfully restricting their eating (i.e., maintaining or gaining weight) found that successful dietary restriction was associated with reductions in binge eating and compensatory behaviors over one-year follow-up (Stice, Martinez, Presnell, & Groesz, 2006). These results provide additional evidence for an inverse association between weight-loss dieting and disinhibited eating.

### 1.1.3. Dieting research in BN

The reliable group differences in eating behavior based on dieting status and weight-loss intentions in non-clinical populations suggest that it is important to investigate whether these patterns hold among individuals with BN, particularly considering the centrality of dieting in current models of BN. Certain studies suggest that additional clarity is needed regarding the role of dieting in maintaining the disorder. For instance, Lowe, Gleaves, and Murphy-Eberenz (1998) divided three samples of individuals with BN into infrequent dieters and frequent dieters. Across these samples, roughly one third were infrequent dieters, raising the question of what maintains binge eating in this group. In two of the three samples, infrequent dieters binged more frequently than frequent dieters. Another study found inverse relationships between binge eating and the EDE Restraint scale as well as an EDE item assessing strength of desire to weigh less (Lowe, Thomas, Safer, & Butryn, 2007). Burton and Stice (2006) provide experimental evidence for an inverse relation between dieting and binge eating in BN: participants randomly assigned to receive a healthy dieting intervention showed greater weight loss and larger decreases in frequency of binge eating compared to controls.

Taken together, these findings suggest that the relationship between dieting to lose weight and binge eating is complex, and raise the possibility that current dieting with the intention of losing weight may be associated with increased control over eating and decreased binge eating in BN, at least in the short term. Thus, research clarifying both the short-term and long-term influences of dieting on binge eating is important for efforts to refine treatment models and maximize treatment gains.

### 1.2. The present study

One purpose of the present study was to re-examine the prevalence of dieting with the intention of losing weight and the relation of such dieting to binge eating in BN. In line with the studies reviewed above, it was hypothesized that individuals who reported currently dieting to lose weight would show reduced binge eating relative to those who reported not currently dieting. In addition, because compensatory behaviors such as self-induced vomiting may produce an energy deficit that could be hypothesized to increase binge eating, vomiting frequency was compared across groups to determine whether this variable might partially explain any group differences found in binge eating frequency.

A second aim was to extend previous research by examining the relation of dieting to lose weight to other eating disorder-specific psychopathology and to depression, which is highly prevalent among individuals with BN (Herzog, Nussbaum, & Marmor, 1996). While depression is a complex problem that may interact with eating pathology to varying degrees depending on the individual, there is reason to believe that examining the relation of weight-loss dieting and depression is relevant. First, frequent food deprivation might produce dysphoria among individuals who significantly restrict their eating. In addition, individuals who are currently dieting in an attempt to lose weight might experience higher dissatisfaction with their weight or shape, another potential source of distress that could contribute to depressed mood. It should also be noted that if the above hypothesis about the relation of dieting and binge eating is not supported and dieting to lose weight is associated with increased rather than decreased binge eating, the feelings of loss of control, guilt, and shame associated with binge eating might also contribute to depressed mood as well as heightened concerns about eating. Accordingly, it was hypothesized that individuals currently dieting to lose weight would show higher scores on measures of depression, dietary restraint, and concerns about eating, shape, and weight.

An exploratory aim of the study was to examine whether the purpose of dieting (to lose weight vs. to avoid weight gain) is significant in understanding the relation of dieting and binge eating. Individuals who are dieting to lose weight may be engaging in more intensive food restriction and may thus be more vulnerable to binge eating relative to those who are dieting to avoid weight gain. However, it is also possible that those dieting to lose weight are more highly motivated to exert control over their eating and, in line with the findings described above, may show reduced binge eating relative to those who are dieting to avoid weight gain.

## 2. Methods

### 2.1. Participants

Participants ( $N = 166$ ) were admitted between December 2009 and September 2010 to two residential treatment centers specializing in eating disorders (one located in an urban area in the northeast and one in the southeastern United States). During this time period, 81% of admitted patients completed the admission research measures. Patients who did not complete admission measures either missed the opportunity due to scheduling conflicts or refused to consent. All participants were females who met DSM-IV criteria for BN and provided informed consent to participate in the research assessment. Participants' mean age at admission was 24.5 years ( $SD = 9.0$ ; range 14 to 58), and average eating disorder duration was 10.0 years ( $SD = 9.7$ ). Participants on average were in the normal weight range (mean BMI = 23.7,  $SD = 5.7$ ; range = 17.3 to 55.2). The vast majority of participants ( $N = 150$ , 90%) reported purging via self-induced vomiting in the 28 days prior to admission. Mean length of treatment was 27.3 days ( $SD = 10.1$ ). Participants were 84.9% Caucasian, 3.0% African American, 2.4% Asian or Pacific Islander, 3.0% Hispanic, 0.6% Native American, 1.2% multiracial, and 4.2% other race or ethnicity. One participant did not report her ethnicity. Eleven percent of participants were married at the time of admission.

### 2.2. Measures

A basic patient information sheet assessed demographic information and age of eating disorder onset. Body weight was measured using an electronic scale and height was measured using a stadiometer.

#### 2.2.1. Dieting status

Two questions assessed current dieting and the purpose of dieting. Participants who answered in the affirmative to the question "Are you

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