

Importance of Size in Defining Binge Eating Episodes in Bulimia Nervosa

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Abstract: Objective: *This study sought to determine if amount of food consumed is important in defining binge eating episodes in individuals with bulimia nervosa (BN).* **Method:** *Women (N = 30) with DSM-IV BN (OBN) and women (N = 25) who would have met DSM-IV criteria for BN except that their binge episodes were not objectively large (SBN) were recruited from the community. Subjects completed telephone interviews and questionnaires.* **Results:** *Results demonstrated no significant differences between women with OBN and SBN in levels of dietary restraint, disinhibition, or hunger; no significant differences in general psychopathology; and significant differences in frequency of binge/purge episodes and impulsiveness. Differences in impulsiveness remained after controlling for frequency of binge/purge episodes.* **Discussion:** *These results partially validate current diagnostic criteria for bulimia nervosa and elucidate one factor, impulsiveness, that may be important in understanding objective binge episodes in bulimia nervosa.* © 2001 by John Wiley & Sons, Inc. *Int J Eat Disord* 29: 294–301, 2001.

Key words: *objective binge eating; subjective binge eating; bulimia nervosa*

INTRODUCTION

Since the introduction of bulimia nervosa (BN) to the Diagnostic and Statistical Manual of Mental Disorders in 1980 (initially termed *bulimia*), several of the diagnostic criteria have changed (American Psychiatric Association [APA], 1980). However, each set of criteria has required that individuals consume a large amount of food for eating episodes to be considered binges (APA, 1980, 1987, 1994). In a review of feeding lab studies of bulimic patients, mean caloric intake during binge episodes ranged from 3,031 to 4,479 kcal, suggesting that these episodes are unambiguously large (Mitchell, Crow, Peterson, Wonderlich, & Crosby, 1998). However, feeding lab studies may not accurately portray binge episodes as they naturally occur in women with BN. Women from both community and clinical samples have given significantly greater emphasis to loss of control compared

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with the amount of food consumed in their lay definitions of binge episodes (Beglin & Fairburn, 1992; Telch, Pratt, & Niego, 1998). In a BN treatment study (Rossiter & Agras, 1990), the majority of episodes described as binges by women involved less than 1,000 kcal. Indeed, 31% of women in this study (Rossiter & Agras, 1990) reported a mean caloric intake during self-described binge episodes that was not appreciably different from caloric intake during meals among normal controls. Thus, women with BN have problems differentiating between binge eating episodes on the basis of whether or not they are objectively large.

Given this ambiguity, two kinds of binges have been defined in eating disorders research (Fairburn & Cooper, 1993) based on the amount of food consumed and subjective loss of control (Figure 1). Objective binge episodes (OBE) represent binges as they are defined within the 4th ed. of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; APA, 1994). The current nosology of BN requires that women have at least two OBEs per week over a period of 3 months. With this definition, women can have subjective binge episodes (SBE) in addition to or even more frequently than OBEs or they can have recurrent OBEs alone. Conversely, women who purge but only have SBEs would be diagnosed with an eating disorder not otherwise specified.

It has long been suggested that perception of loss of control and perceived excessive intake are more important than the actual amount of food consumed in defining binge eating episodes (Fairburn, 1983). Age of onset and predictors of OBEs and SBEs appear to be almost identical (Stice, Killen, Hayward, & Taylor, 1998). Recent investigations have indicated that differentiating between OBEs and SBEs may not be clinically meaningful because they are not associated with different levels of depression or anxiety (Hay, Fairburn, & Doll, 1996; Pratt, Niego, & Agras, 1998; Tobin, Griffing, & Griffing, 1997). These studies are reviewed below.

Hay et al. (1996) recruited subjects from a community sample based on women's reports of recurrent episodes of binge eating. Binge eating included both OBEs and SBEs. Women underwent structured interviews including the Eating Disorders Examination (EDE) and Structured Clinical Interview for DSM-III-R (SCID-I). Cluster analyses revealed four symptom patterns. The first cluster represented a purging disorder, primarily via self-

		Loss of Control?	
		YES	NO
Large Amount of Food?	YES	OBE	Objective Overeating
	NO	SBE	Subjective Overeating

Figure 1. Distinction between objective binge episodes (OBE) and subjective binge episodes (SBE).

induced vomiting (97% of women in cluster) or laxatives (63%), accompanied by either OBEs (43%) or SBEs (30%) or both (27%). The second cluster resembled women with nonpurging BN; all had OBEs and high levels of dietary restraint but few purged or had SBEs. A third cluster included women with recurrent SBEs (100%), some of whom also had OBEs (40%) and engaged in purging via self-induced vomiting (13%) or laxatives (33%). The fourth cluster was heterogeneous and presented with the least disturbance. Notably, the first cluster was associated with the greatest levels of psychopathology and the worst outcome at 1-year follow-up assessment. This study (Hay et al., 1996) did not support defining binge eating episodes by size among women who purge because both baseline and follow-up assessments failed to separate women who purged based on the size of their binge eating episodes.

Pratt et al. (1998) assessed 174 women seeking treatment for DSM-IV BN. Subjects completed structured clinical interviews (EDE, SCID-I, and SCID-II) and questionnaire assessments (Symptom Check List-90, Rosenberg Self-Esteem Scale, Social Adjustment Scale-Self Report). The authors created two measures of binge eating, namely, the sum of OBEs and SBEs and the difference between number of OBEs and SBEs. Although total number of binge eating episodes (OBEs plus SBEs) was associated with a measure of self-efficacy, the relative proportion of binge episodes comprising SBEs (SBEs minus OBEs) was not associated with any measure. The relative frequency of subjective versus objective binge episodes was not associated with differences in demographic variables, eating disorder characteristics, or general psychopathology. The authors concluded that relying on consumption of an objectively large amount of food in defining binge eating episodes might not be valid due to the inability of scores on other measures to distinguish between OBEs and SBEs. Notably, women in this study (Pratt et al., 1998) all met DSM-IV criteria for BN and therefore all engaged in OBEs at least twice per week over a 3-month period. Their shared diagnostic status according to current criteria could account for the failure to find meaningful distinctions within this subject group between OBEs and SBEs.

Tobin et al. (1997) compared women with binge eating disorder (BED), purging BN, nonpurging BN, and a fourth category, compensatory eating disorder (CED). CED is a clinical pattern characterized by the use of inappropriate compensatory behaviors to control weight in the absence of recurrent OBEs. Women in the CED group did not necessarily perceive themselves as having any form of binge eating episode and compensatory behaviors included both purging and nonpurging methods. No significant differences were found between the purging BN group and the CED group on demographic variables, eating disorder characteristics, or general psychopathology. However, the CED group was more likely to have a history of hospitalization. The authors concluded that compensatory behaviors, such as self-induced vomiting, and not binge eating, represent the "focal clinical features of bulimia nervosa" (p. 184).

These studies (Hay et al., 1996; Pratt et al., 1998; Tobin et al., 1997) suggest that, apart from the size of binge eating episodes, symptom patterns and clinical correlates may be similar for women who meet full criteria for BN-purging subtype (objective bulimia nervosa [OBN]) and women who would meet these criteria except they only experience SBEs (subjective bulimia nervosa [SBN]). However, a number of methodological limitations constrain this conclusion. The failure across studies to control for lifetime histories of BN is a significant limitation. Specifically, an inability to distinguish between SBEs and OBEs may be due to a high lifetime prevalence of full BN among women who no longer have OBEs. Indeed, in one long-term outcome study of BN (Keel, Mitchell, Miller, Davis, & Crow, 2000), women were as likely to purge in the absence of OBEs as to have full BN at final follow-up assessment. An additional limitation is the use of treatment-seeking

samples in two studies (Pratt et al., 1998; Tobin et al., 1997) to assess comorbid psychopathology. Results of these studies may have suffered from Berkson's bias (Berkson, 1946). This bias produces high levels of comorbidity within treatment-seeking samples because treatment is more likely sought by individuals with comorbid disorders than individuals with a single disorder. Treatment seeking may mask differences in comorbidity that distinguish between OBEs and SBEs. Finally, only one of these studies (Pratt et al., 1998) included personality measures; however, all women in this study (Pratt et al., 1998) shared a diagnosis of DSM-IV BN. Potentially, women with OBN may differ from women with SBN on a measure of personality such as impulsiveness. Perhaps women with OBN have lower levels of impulse control compared with women with SBN and non-eating-disordered women. A diminished ability to control the impulse to eat could contribute to the ingestion of a large amount of food during binge eating episodes.

To our knowledge, no published study has tested the utility of defining binge eating episodes according to the amount of food consumed by comparing women who meet full criteria for OBN with women who meet criteria for SBN. Additionally, no study has assessed the importance of this distinction by comparing eating pathology, general psychopathology, and personality in these groups. Finally, no study has sought to understand why some women discontinue a binge episode before it becomes objectively large whereas others consume extraordinarily large amounts of food.

METHODS

Subjects

Women ($n = 30$) with OBN and women ($n = 24$) with SBN were recruited for participation via advertising in the community. Women were interviewed using Module H of the SCID-I and questions concerning binge eating from the EDE to determine study eligibility. Among women with SBN, no woman could have a history of OBEs. Of the 30 women with OBN, 25 were recruited for and completed participation in a study that required visits to the research lab at Harvard University (Harnden-Fischer, 1999). Women with SBN and the remaining 5 women with OBN were recruited for the present study.

Subjects with OBN did not differ from subjects with SBN on demographic variables, with one exception. Women with OBN were significantly older than women with SBN (M [SD] age OBN: 25.4 [5.5] and SBN: 21.4 [3.4]); $t(49) = 3.31, p < .01$. Among participants, 2% were in high school, 56% were in college, 19% had completed college, and 23% were either in graduate school or had completed graduate school. The majority of subjects were full-time students (63%); however, 33% were employed at least part-time and 4% were unemployed. Among subjects, 75% were Caucasian, 11% were Asian, 6% were African American, 6% were Hispanic, and 2% were of mixed racial background.

Measures

For the present study, women completed the following questionnaire assessments. As measures of eating pathology, women completed the Revised Restraint Scale (Herman & Polivy, 1980), the Bulimia Test-Revised (BULIT-R; Thelen, Farmer, Wonderlich, & Smith, 1991), and the Three-Factor Eating Questionnaire (TFEQ; Stunkard & Messick, 1985). The TFEQ comprises three dimensions of human eating behavior: cognitive restraint of eating, disinhibition, and hunger. As measures of general psychopathology, women completed

the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), the Michigan Alcoholism Screening Test (MAST; Selzer, 1971), and the Drug Abuse Screening Test (DAST; Skinner, 1982). As a measure of personality, women completed the Barratt Impulsiveness Scale-11 (BIS-11; Patton, Stanford, & Barratt, 1995).

These measures were selected for their strong psychometric properties and to minimize participation requirements for subjects in the present study.

Analyses

Analyses were conducted using SPSS for Macintosh. Responses to at least 80% of items were required for scaled scores to be included. When at least 80% but fewer than 100% of items had been completed for a given measure, scale scores were prorated. Given the significant difference in age between subject groups, all analyses were conducted with age entered as a covariate. However, mean (*SD*) values presented in Tables 1 and 2 are not age adjusted. A multivariate analysis of variance (MANOVA) was employed to determine if women with OBN differed from women with SBN across measures of eating pathology, general psychopathology, and impulse control. A *p* value of .05 was set for statistical significance.

RESULTS

Results from the MANOVA indicated a significant difference across measures due to the main effect of diagnostic group, $F(10,37) = 2.2, p < .05$. Follow-up analyses of variance (ANOVAs) suggested no significant differences in eating pathology measured by the Revised Restraint Scale or TFEQ subscales (Table 1). However, a significant main effect for diagnostic status was found for frequency of binge eating and purging episodes. Women with OBN engaged in both binge eating and purging episodes approximately twice as often as did women with SBN. Furthermore, women with OBN had significantly higher scores on the BULIT-R compared with women with SBN.

Follow-up ANOVAs suggested no significant differences between women with OBN and SBN in general psychopathology. Diagnostic status did not account for a significant portion of variance in depression, anxiety, or history of alcohol or substance abuse (Table 2). Despite a lack of difference between women with OBN and SBN in general psycho-

Table 1. Comparisons of women with OBN and SBN on measures of eating pathology

Measure	OBN (<i>n</i> = 30) <i>M</i> (<i>SD</i>)	SBN (<i>n</i> = 24) <i>M</i> (<i>SD</i>)	<i>F</i> (1,51) <i>M</i> (<i>SD</i>)
Revised Restraint Scale	26.1 (4.3)	24.3 (4.0)	2.0
TFEQ-cognitive restraint	14.4 (4.3)	16.0 (4.5)	0.3
TFEQ-disinhibition	12.6 (2.0)	11.0 (4.1)	2.5
TFEQ-hunger	7.7 (3.2)	6.7 (3.9)	1.7
Bulimia Test-Revised	114.6 (15.0)	101.8 (13.0)	11.1*
Binge frequency	6.7 (5.8)	3.0 (1.5)	8.0*
Purge frequency	7.8 (7.5)	3.2 (1.8)	8.3*

Note: OBN = objective bulimia nervosa; SBN = subjective bulimia nervosa; TFEQ = Three-Factor Eating Questionnaire.

**p* < .01.

Table 2. Comparisons of women with OBN and SBN on measures of general psychopathology

Measure	OBN (<i>n</i> = 30) <i>M</i> (<i>SD</i>)	SBN (<i>n</i> = 24) <i>M</i> (<i>SD</i>)	<i>F</i> (1,51) <i>M</i> (<i>SD</i>)
Beck Depression Inventory	17.2 (9.7)	17.0 (9.0)	0.6
State-Trait Anxiety Inventory: State	45.2 (12.2)	47.5 (12.7)	0.0
State-Trait Anxiety Inventory: Trait	52.6 (11.4)	54.2 (10.4)	0.0
Michigan Alcoholism Screening Test	6.6 (10.6)	2.7 (3.0)	3.4
Drug Abuse Screening Test	3.7 (5.2)	2.0 (2.4)	1.8
Lifetime psychological treatment	77.8%	39.1%	7.7*

*Chi-square, $p < .01$.

pathology, women with SBN received significantly less psychological treatment during their lifetime compared with women with OBN, $\chi^2(1) = 7.7, p < .01$.

An ANOVA demonstrated that diagnostic status (OBN vs. SBN) accounted for a significant portion of variance in BIS-11 scores, $F(1, 51) = 7.8, p < .01$. In order to distinguish the effects of size of binge episodes from the frequency of binge episodes, the frequencies of binge and purge episodes were entered as covariates in a second ANOVA of the BIS-11. Again, diagnostic status accounted for a significant portion of variance in BIS-11 scores, $F(1, 46) = 4.9, p < .05$. Women with OBN had significantly less impulse control compared with women with SBN; *M* (*SD*) BIS-11 scores for OBN and SBN women were 82.8 (11.9) and 73.0 (12.8), respectively.

DISCUSSION

This study replicated results of previous investigations in finding that the amount of food consumed during binge eating episodes is not associated with general psychopathology or some measures of eating pathology such as dietary restraint. However, other measures of eating pathology such as frequency of binge eating and purging episodes and BULIT-R scores did differ between women with OBN and women with SBN. Additionally, women with SBN were less likely to have received psychiatric treatment compared with women with OBN. Finally, women with OBN reported significantly less impulse control compared with women with SBN.

The present study suggests that the amount of food consumed may be important in defining binge eating episodes in BN patients if impulsiveness is viewed as an integral part of the pathology. Conversely, binge size may represent a basis on which to subtype women with a purging disorder. Future research may benefit from studying women who purge but do not experience objectively large binge episodes. Such research may reveal why some women discontinue a binge episode before it becomes objectively large whereas others consume extraordinarily large amounts of food. The present study indicates that women with OBN and SBN both experience disinhibition around food, perhaps explaining the subjective sense of loss of control reported by both groups. However, one possible explanation for differences in the amount of food consumed could be that women with OBN have lower levels of impulse control compared with women with SBN and non-eating-disordered women. A diminished ability to control the impulse to eat could contribute to the ingestion of a large amount of food during binge eating episodes.

Despite a number of strengths in the current study, limitations should also be noted. First, the assessments were limited in scope in order to minimize participation require-

ments for subjects. Interview measures of eating pathology, general psychopathology, and personality would be important for understanding both similarities and differences between women with OBN and SBN. Second, most women with OBN participated in a more extensive study protocol that required personal visits to the research lab. This difference would seem to decrease the likelihood of greater impulse control problems in the OBN group because greater skill in planning and follow-through would be required for attending personal visits. However, the difference in participation requirements may have produced a bias that masked similarities or significant differences between the two groups. Finally, the current assessments allowed only for a cross-sectional comparison. Longitudinal data would be important to understand the predictive validity of distinguishing among women who purge following OBE versus SBEs.

The present study suggests that women with SBN may be underrepresented in treatment-seeking samples, as women with SBN were significantly less likely to have received psychological treatment compared with women with OBN. We may treat what we define in addition to the tendency to “study what we define” (Walsh & Kahn, 1997, p. 369). Interestingly, Russell’s (1979) seminal description of BN was based on 30 patients whom he studied over 6.5 years. Had this been taken as a true measure of the prevalence of BN, research elucidating the efficacious treatment of this disorder never would have been undertaken. By specifically recruiting women with SBN for further research, we may discover that this condition is not a rarity, but a significant source of undetected psychiatric morbidity within eating disorders.

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