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Bulimia nervosa in overweight and normal weight women

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Abstract

The aim of the present study was to examine overweight bulimia nervosa (BN) in a community sample of women. Volunteers ($N=1,964$) completed self-report questionnaires of weight, binge eating, purging, and cognitive features. Participants were classified as overweight ($BMI \geq 25$) or normal weight ($BMI < 25$). Rates of BN within the overweight and normal weight classes did not differ (6.4% vs. 7.9%). Of the 131 participants identified as BN, 64% ($n=84$) were classified as overweight BN (OBN) and 36% ($n=47$) as normal weight BN. The OBN group had a greater proportion of ethnic minorities, and reported significantly less restraint than the normal weight BN group. Otherwise, the two groups reported similarly, even in terms of purging and depression. In summary, rates of BN did not differ between overweight and normal weight women. Among BN participants, the majority (two-thirds) were overweight. Differences in ethnicity and restraint, but little else, were found between overweight and normal weight BN. Findings from the present study should serve to increase awareness of the weight range and ethnic diversity of BN, and highlight the need to address weight and cultural sensitivity in the identification and treatment of eating disorders.

Keywords

obesity; binge eating; bulimia nervosa; eating disorders; prevalence

Introduction

According to the Diagnostic and Statistical Manual Of Mental Disorders, Fourth Edition (DSM-IV) and the DSM-IV-Text Revision (DSM-IV-TR), the two prominent behavioral features of bulimia nervosa (BN) include: recurrent episodes of binge eating, and recurrent episodes of inappropriate compensatory behavior to prevent weight gain (e.g., self-induced vomiting, fasting, excessive exercise, or misuse of laxatives, diuretics, enemas, or other medications). While weight status is not a diagnostic criterion for BN, the DSM-IV states that moderate and morbid obesity are uncommon comorbid conditions within this diagnostic group.

There is a substantial body of eating disorder literature in which investigators have examined subgroups of, or groups with many similarities to, patients with bulimia nervosa

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Disclosure

The authors have no conflicts of interest.

(BN). This has included comparisons of behavioral and eating disorder-related functioning for individuals with BN and differing histories of anorexia nervosa (AN) [1–3], for individuals with BN who use different methods of compensatory behaviors [4], for individuals who have recurrent episodes of binge eating but not compensatory behaviors (e.g., binge eating disorder (BED) [5]), for individuals who do not binge eat but do engage in recurrent compensatory behaviors (e.g., purging disorder [6]), and for individuals with BN who have personality disorder or substance abuse comorbidities [7, 8]. Thus, much has been learned about the behavioral and eating disorder pathology of individuals with BN or behaviorally similar eating disorders in relation to eating disorder history, method and presence of compensatory behaviors, and presence of binge eating and other comorbidities.

Despite the rapid escalation in rates of overweight and obesity in the general population since the publications of DSM-IV and DSM-IV-TR, only one study to date has examined comorbid overweight or obesity among individuals with BN [9]. In 1990, Mitchell and colleagues [9] found that only a small percent (4.2%) of clinic patients with BN were also overweight and that this subgroup differed considerably from patients with normal weight BN. The aim of the present study was to examine overweight in a community sample of women with BN.

Overweight and normal weight community volunteers who self-reported symptoms consistent with a diagnosis of BN were compared on rates of diagnosis, demography, diagnostic criteria, and associated clinical features. We hypothesized that an overweight subgroup of women with BN would be well-represented, and that this group would report greater levels of binge eating, lower levels of purging and similar levels of severity for the clinical eating disorder features in comparison to a normal weight group of women with BN.

Method and Procedures

Participants

Participants were 1,964 community women (18 years old or greater) who completed a battery of questionnaires online in response to advertisements requesting participation in a research study on eating and dieting. Participants were identified for the present study if they: 1) were normal or overweight defined as a body mass index (BMI) of greater than or equal to 18.5 ($n=1,897$ of 1,964); and 2) met modified criteria for BN (binge eating and purging at least once per week for the past 28 days, and overvaluation of body shape/weight at an intensity of “moderately” or greater on the Eating Disorder Examination-Questionnaire described in greater detail below; $n=131$ of 1,897). The approach of defining BN with a once-weekly frequency criterion was used because research has consistently supported a broadening of the required frequency criterion from twice-weekly to once-weekly [10, 11].

Procedure

Advertisements were placed on Craigslist internet classified ads throughout the United States (e.g., New York, Washington DC, San Antonio, Philadelphia, Boston, Baton Rouge, Tulsa, Austin, Oklahoma City, Seattle, San Francisco). Volunteers were sought to complete on-line questionnaires about dieting, weight concerns and/or eating habits. Ads contained a link to the online data gathering website SurveyMonkey (www.surveymonkey.com). Volunteers were offered a 1 in 20 chance to receive a \$50 gift card in exchange for participation. Participants were required to affirm willingness to participate and to provide informed consent prior to accessing the questionnaires. Procedures for obtaining consent received approval from the Yale School of Medicine Institutional Review Board. No personal identifying information was collected.

Assessments and Measures

Participants provided basic demographic information, including self-reported height and current weight, and completed the following self-report measures:

The *Eating Disorder Examination Questionnaire (EDE-Q)* [12], the self-report version of the EDE interview [13, 14], was used in part to create the two study groups based on the three prominent diagnostic features of BN according to the DSM-IV-TR [15]: recurrent episodes of binge eating, recurrent episodes of inappropriate compensatory behaviors to avoid weight gain, and self-evaluation unduly influenced by body shape and weight. The *EDE-Q* focuses on the previous 28 days and assesses the frequency of *binge eating episodes* (objective bulimic episodes, i.e., eating unusually large amounts of food while experiencing a subjective sense of loss of control), as well as the frequency of *purging episodes* (self-induced vomiting, and laxative and diuretic misuse). The *EDE-Q* has received empirical support for identifying binge eating and purging in community studies [16]. In addition, the *EDE-Q* contains two items that tap overvaluation of body shape/weight (i.e., the DSM-IV-TR [15] diagnostic criterion “self-evaluation unduly influenced by body shape and weight.”) Participants who reported moderate importance or greater (i.e., a score of 4 or greater) on either the “Has your *shape* influenced how you think about (judge) yourself as a person?” or “Has your *weight* influenced how you think about (judge) yourself as a person?” were considered to meet this criterion as this methodology has been used in previous studies (e.g., [17]). In addition the *EDE-Q* generates four subscales that reflect the attitudinal features of eating disorders. These are: *dietary restraint*, *eating concern*, *weight concern*, and *shape concern*. The Total *EDE-Q* score represents the average of the four subscales.

The *Beck Depression Inventory (BDI)* [18] 21-item version is a widely used inventory of the cognitive, affective, and somatic symptoms of depression. Studies have reported adequate internal consistency (coefficient alpha generally ranges .73 to .95), acceptable short-term test-retest reliability, and convergent validity [19]. Higher scores reflect greater depressive symptoms.

Overview of Analyses

Descriptive summaries were presented in terms of means and standard deviations, and relative frequencies and percentages for continuous and discrete variables, respectively. Analyses using analysis of variance (ANOVA) and analysis of covariance (ANCOVA) controlling for BMI and ethnicity were conducted to test for differences between groups on diagnostic and clinical features. Correlation analyses were performed between BMI and eating disorder variables within groups.

Results

Rates of Overweight and Obesity, and BN Diagnosis

The prevalence of overweight and obesity in the overall sample ($n=1,897$) was: 68.7% with $BMI \geq 25$, 44.9% with $BMI \geq 30$, and 14.4% with $BMI \geq 40$. Among the 1,897 women with a BMI of 18.5 or greater, the overall rate of BN was 6.9% ($n=131$). Rates of BN within each weight classification were: 6.4% in the overweight class ($n=84$ of 1,303) and 7.9% in the normal weight class ($n=47$ of 594). Overweight and normal weight classes did not differ in rates of BN ($\chi^2(1) = 1.36, p=.243$). In the BN subgroup ($n=131$), the prevalence of overweight and obesity was: 64.1% with $BMI \geq 25$, 40.5% with $BMI \geq 30$, and 15.3% with $BMI \geq 40$.

Validation and Demography of BN Study Groups

Of the 131 women identified as BN, 64% ($n=84$) were classified as Overweight BN (OBN; $BMI \geq 25$) and 36% ($n=47$) as normal weight BN ($BMI < 25$). Rates of obesity for $BMI \geq 30$ and $BMI \geq 40$ were 40.5% ($n=53$) and 15.3% ($n=20$), respectively. The mean BMI was 30.2 kg/m^2 ($range = 18.58$ to 60.0 , $SD=8.9$). By definition, the OBN group was heavier than the normal weight BN group ($M=34.7$, $SD=8.1$ vs. $M=22.2$, $SD=1.7$, $F(1, 129)=107.8$, $p=.000$). Mean age for the overall sample was 33.3 ($range = 18$ to 64 , $SD=10.7$), and analysis of variance (ANOVA) showed no significant differences for age ($F(1, 108)=1.19$, $p=.278$) across the weight groups. The racial/ethnic distribution was: 77.1% ($n=101$) Caucasian, 10.7% ($n=14$) Hispanic, 5.3% ($n=7$) African American, 3.1% ($n=4$) Asian, and 3.8% ($n=5$) reporting "other." Chi-square test of independence performed on the two study groups showed significant differences for ethnicity ($\chi^2(df=1, N=131)=4.26$, $p=.039$). The OBN group had a greater proportion of non-Caucasians (28.6%, $n=24$ of 84) than the normal weight BN group (12.8%, $n=6$ of 47).

Do Overweight and Normal Weight Groups Differ on Diagnostic Features of BN?

Table 1 summarizes ANOVAs performed for the diagnostic features of BN according to DSM-IV-TR [15] and adapted for the present study: binge eating episodes, purging episodes, and self-evaluation unduly influenced by body shape and weight (shape and weight are presented separately). A significant finding was found for the frequency of binge eating episodes (previous 28 days), but not for the other diagnostic items. The OBN group reported less frequent binge eating than the normal weight BN group ($M=12.4$ episodes, $SD=7.7$ vs. $M=18.0$, $SD=21.2$; $F(1, 130)=4.74$, $p=.031$). All findings remained consistent using ANCOVA controlling for BMI and ethnicity with the exception of binge eating which was no longer significant.

Do Overweight and Normal Weight Groups Differ on Clinical Features of BN?

Table 2 summarizes ANOVAs performed for the clinical features of BN including the four subscales and total scale of the EDE-Q, and the BDI. A significant finding was revealed for Restraint, but not for the other clinical features. The OBN group reported less restraint than the normal weight BN group ($M=3.7$, $SD=1.5$ vs. $M=4.5$, $SD=1.0$; $F(1, 130)=12.5$, $p=.001$). ANCOVA controlling for BMI and ethnicity also revealed a significant difference between the overweight and normal weight BN groups for restraint ($F(3, 113)=3.33$, $p=.022$) and BDI ($F(3, 113)=3.18$, $p=.027$). All other findings remained consistent using ANCOVA.

Are Eating Disorder Diagnostic and Clinical Features Related to BMI?

Table 3 summarizes a correlation analysis performed between the eating disorder variables and BMI, separately by study group. Among both the overweight and normal weight groups, BMI was significantly related to the item representing overvaluation of body shape/weight (i.e., "Has your weight influenced how you think about (judge) yourself as a person?"). Higher weight was related to greater weight self-evaluation within both study groups ($r=.22$, $p=.041$ and $r=.35$, $p=.015$ for overweight and normal weight BN, respectively). Fisher r -to- z transformations of the correlation coefficients found that the magnitude of correlation did not differ across the overweight and normal weight BN groups ($p=.45$). BMI was also significantly related to depression as measured by the BDI in the OBN group ($r=.30$, $p=.008$) but not the normal weight BN group ($r=.062$, $p=.70$). None of the other diagnostic or clinical features was related to BMI within either group.

Discussion

To date, studies of individuals with BN have primarily been comprised of normal weight, Caucasian women. As the population changes with regard to weight status and ethnic diversity, we hypothesized that these changes might be reflected in a community sample of women with BN. The last study to compare overweight and normal weight BN was published in 1990 [9]. Rates of BN did not differ between overweight and normal weight classes of women (6.4% vs. 7.9%, respectively) who participated in an on-line research study on eating and dieting. Among women identified with BN, we found that overweight BN made up the majority (64%), compared to the normal weight subgroup of BN participants (36%). Few differences were found between overweight and normal weight BN participants, except for a greater proportion of ethnic minority women, less restrained eating, and an association between BMI and symptoms of depression, among the overweight group.

While weight status is not a diagnostic criterion for BN, the disorder has been historically associated with normal weight. In anticipation of DSM-V many issues have been raised about definitions of binge eating and loss of control, as well as the specific diagnostic criteria for BN such as the frequency and duration of the binge eating and compensatory behaviors, and whether subtyping by compensatory behavior is supported by the existing literature [20]. Despite these many issues, and the rapid escalation in rates of overweight and obesity in the general population, it is surprising that more attention has not been given to comorbid overweight and obesity in BN. In the present study, two-thirds of a community sample of women with BN had a BMI of 25 or greater. While this seems at odds with prevailing beliefs about weight status and BN, and the 1990 published rate of 4.2% for BN clinic patients who were greater than or equal to 130% of ideal body weight [9], recent epidemiologic studies have documented an increased risk of BN in overweight and obese groups [21, 22].

In the current community study, 23% of the entire sample represented ethnic minorities whereas clinical studies of BN in the United States have primarily been comprised of Caucasian women [23]. Interestingly, we observed a higher rate of ethnic minorities in the overweight BN group (approximately 29%) than the normal weight BN group (approximately 13%). We hypothesize that there may be an increasing proportion of overweight individuals with BN as the population rate of overweight has increased [24]. The greater proportion of overweight ethnic minorities with BN may be reflective of the greater proportion of overweight ethnic minorities in the population [24] and/or may be explained by an existing classification system for eating disorders that is not culturally sensitive for capturing maladaptive behaviors and cognitions related to eating and weight [25, 26]. Several recent studies have found similar rates of eating disorder symptoms, including binge eating and purging, across ethnic groups [27–29], yet rates of BN among Hispanics have been found to be both higher [30] and lower [26], than non-Hispanic Caucasians.

It is noteworthy that the overweight and normal weight BN groups did not differ in age, or on any diagnostic or clinical features with the exception of restraint. These findings suggest that the lower weight in the normal weight BN group may be attributed to greater efforts at dieting, rather than to the effects of purging or age. However, these results contrast findings by Mitchell and colleagues who found that a normal weight sample of clinic patients with BN were younger and had more frequent binge eating and vomiting episodes than the overweight counterparts [9]. Differences from the present study may be attributed to both cohort effects and differences in sample types (i.e., clinical vs. community, treatment seeking vs. not). Also of note was the relationship between symptoms of depression and BMI in the OBN group, but not the normal weight BN group. We hypothesize that the

additional problem of overweight may compound the symptoms of depression that coexist with BN.

Our study has a number of strengths and limitations that need to be considered as context for interpreting the findings. This study relied on a sample of convenience; that is a community sample of volunteers who met modified criteria for BN based upon self-report measures. These individuals may be somewhat different than the general or eating disorder populations. For example, rates for overweight and obesity in the overall and BN samples from the present study were higher than prevalence rates reported in the general [24] and eating disorder [31] populations, respectively. These volunteers may also be different than individuals known to meet DSM-IV, or proposed DSM-V, diagnostic criteria for BN. The relatively high rate of BN in the present sample compared to the rate reported in the National Comorbidity Survey Replication [31] may be due to the self-selection of the sample, the self-report of symptoms, the modification of the BN criteria, or all of these factors. In addition, while a strength of the study was the use of the modified criteria for BN that were more in line with the proposed DSM-V criteria, at the same time findings from the present study may be limited in their ability to generalize to a more “pure” DSM-IV sample of BN that were believed to be closer to normal weight status.

While the use of diagnostic interviews may have been preferable in identifying participants with BN, the use of a community sample and the method of anonymous data collection may have improved participants’ candor, especially as it pertains to disordered eating. Another limitation was the use of self-reported height and weight compute BMI. While self-report is associated with overestimation of height and underestimation of weight, self-reported height and weight are highly correlated with actual height and weight, and clinic measures, even among obese groups [32–36]. This suggests that self-reported height and weight are an adequate proxy for measured weights. Finally, this sample was restricted to women with purging subtype of BN, and it is not clear if these findings would generalize to men with BN or individuals with non-purging BN.

The present study found similar rates of BN between overweight and normal weight women, and that overweight BN made up the majority (two-thirds) of a community sample of women who met criteria for self-reported, modified criteria for BN. Surprisingly, few differences were found between overweight and normal weight BN community volunteers except for a greater proportion of ethnic minority women within the overweight group. Previous studies indicate that treatment seeking by ethnically diverse women is less frequent than by Caucasian women with eating disorders [37]. Thus, findings from the present study should serve to increase awareness of the weight range and ethnic diversity of BN, and highlight the need to address weight and cultural sensitivity in the identification and treatment of eating disorders.

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Table 1

Comparisons of overweight and normal weight BN on diagnostic features

	Overall (N=131)			Overweight BN (n=84)			Normal Weight BN (n=47)			ANOVAs			
	M	SD		M	SD		M	SD		F	p	η^2	
EDE-Q Binge Eating Episodes (past 28 days) ^a	14.4	14.3		12.4	7.7		18.0	21.2		1, 129	4.74	.031	.035
EDE-Q Purging Episodes (past 28 days)	17.9	16.3		16.8	15.9		20.0	17.0		1, 125	1.12	.291	.009
EDE-Q "Has your shape influenced how you think about (judge) yourself as a person?"	5.6	0.9		5.6	0.7		5.5	1.0		1, 129	0.80	.372	.006
EDE-Q "Has your weight influenced how you think about (judge) yourself as a person?"	5.5	0.9		5.6	0.8		5.4	1.2		1, 129	1.00	.320	.008

^a ANCOVA controlling for BMI and ethnicity was $F(3, 113)=0.58, p=.630$, not significant.

Table 2

Comparisons of overweight and normal weight BN on clinical features

	Overall (N=131)		Overweight BN (n=84)		Normal Weight BN (n=47)		ANOVAs		
	M	SD	M	SD	M	SD	df	F	p
EDE-Q Restraint ^a	4.0	1.4	3.7	1.5	4.5	1.0	1, 129	12.47	.001
EDE-Q Eating Concern	4.2	1.3	4.2	1.3	4.2	1.3	1, 129	0.04	.851
EDE-Q Shape Concern	5.4	0.6	5.5	0.6	5.3	0.6	1, 129	3.10	.081
EDE-Q Weight Concern	4.9	0.8	4.9	0.7	4.7	1.0	1, 129	2.20	.140
EDE-Q Total	4.6	0.8	4.6	0.8	4.7	0.8	1, 129	0.79	.376
Beck Depression Inventory ^b	24.2	10.0	24.6	9.9	23.4	10.3	1, 118	0.34	.560

^a ANCOVA controlling for BMI and ethnicity was $F(3, 113)=3.33, p=.022$, significant.^b ANCOVA controlling for BMI and ethnicity was $F(3, 113)=3.18, p=.027$, significant.

Table 3

Correlations of BMI and eating disorder variables

Eating Disorder Variables	Overweight BN		Normal Weight BN	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
EDE-Q Binge Eating Episodes	−.01	.903	.10	.507
EDE-Q Purging Episodes	.13	.237	.00	.985
EDE-Q “Has your shape influenced how you think about (judge) yourself as a person?”	.18	.101	−.04	.817
EDE-Q “Has your weight influenced how you think about (judge) yourself as a person?”	.22		.35	
		.041		.015
EDE-Q Total	−.04	.707	−.02	.922
Beck Depression Inventory	.30	.008	.06	.698