

Comparison of Patients With Bulimia Nervosa, Obese Patients With Binge Eating Disorder, and Nonobese Patients With Binge Eating Disorder

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Abstract: This study compared patients with bulimia nervosa (BN), obese patients with binge eating disorder (BED), and nonobese patients with BED. One hundred sixty-two adult women consecutively evaluated for outpatient clinical trials who met DSM-IV criteria for BN, purging type ($N = 46$) or for BED ($N = 79$ obese and $N = 37$ nonobese) were compared using the Eating Disorder Inventory (EDI). The three groups differed significantly on two (drive for thinness and body dissatisfaction) of the three eating-related scales and on all five of the general personality scales of the EDI. When age and depression level were controlled, findings for the eating-related scales did not change, whereas four of the five general personality scales were no longer significant. Post hoc analyses revealed that the BN group and the nonobese BED group had significantly higher drive for thinness than the obese BED group. The nonobese and the obese BED groups did not differ from each other in any area (other than drive for thinness), including body dissatisfaction. The nonobese and the obese BED groups had significantly lower maturity features than the BN group. Our findings suggest that when the effects of age and depression levels are controlled, treatment-seeking women with BN and BED are generally similar. Certain differences that do exist between women with BN and BED are associated with obesity status (drive for thinness), whereas others are associated with diagnosis (body dissatisfaction, maturity fears).

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Binge eating is characterized in DSM-IV (American Psychiatric Association, 1994) as eating an amount of food in a discrete period of time that is clearly larger than most

people would eat under similar circumstances, accompanied by a subjective sense of loss of control. Binge eating is a core feature of binge eating disorder (BED), a newly defined provisional eating disorder diagnosis in the DSM-IV (American Psychiatric Association, 1994), and of bulimia nervosa (BN), a well established eating disorder diagnosis. Although the diagnosis of BED requires that distress about the binge eating is present, the diagnosis does not require the presence of the two other BN criteria (*i.e.*, inappropriate weight control behaviors and overvalued ideas about weight or shape).

Since the multisite field trials (Spitzer et al., 1993), empirical studies have reported general, but not unequivocal, support for the validity of the BED diagnosis (Grilo, 1998; 2002a). Overall, people with BED differ from those who do not binge eat, and BED appears to have important similarities with and differences from BN (Grilo, 2002a). Three recent major findings support the validity of the BED diagnosis. BED and BN differ in their risk factor profiles (Fairburn et al., 1998) and in their natural course and outcome (Fairburn et al., 2000), and they resemble different (latent) categories of eating problems (Bulik et al., 2000).

Although the emerging literature suggests the validity of BED, many substantive questions remain about its diagnostic features and its specific and associated psychopathology (Grilo, 1998). Studies using clinical (Masheb and Grilo, 2000; Wilfley et al., 2000) and community samples (Striegel-Moore et al., 2001) have found that although people with BN generally report higher levels of dietary restraint, people with BN and BED tend to report similar eating disorder-specific attitudes and overvalued ideas regarding weight and shape. Although people with BED tend to be heavier and are more likely to suffer from obesity than people with BN (Striegel-Moore et al., 2001), two different studies (Masheb and Grilo, 2000; Wilfley et al., 2000) found that the marked similarities in eating disorder-specific cognitions among BN and BED were unrelated to body mass index (BMI) or obesity status.

Although BED and obesity are associated, the nature of this association is uncertain. Although binge eating is asso-

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ciated with increased risk for obesity (Telch et al., 1988) and people with BED are more likely to be obese than their purging and nonpurging BN counterparts, many questions remain regarding this complex relationship. Interestingly, familial obesity seems to be a stronger risk factor for BN than BED (Fairburn et al., 1998). Nonetheless, binge eating appears to be associated with future weight gain in clinical (Agras et al., 1994) and naturalistic studies (Fairburn et al., 2000). The complex associations between obesity and BED may be related in part to age; samples with younger participants with BED (Fairburn et al., 2000) tend to have lower rates of co-occurring obesity than samples with older participants with BED (Striegel-Moore et al., 2001).

Grilo (2002a) noted that obesity is associated with but is not necessary for the diagnosis of BED, and that it is not uncommon to see BED in cases without obesity. For example, Fairburn et al. (2000) found that only 21% of 48 people with BED recruited for a naturalistic longitudinal study were obese. Although community studies generally include substantial portions of participants with BED who are not obese, it appears that the clinical literature is characterized by primarily obese samples of patients with BED. Although this may reflect in part a form of treatment-seeking bias, it may also reflect the recruitment of many research centers, where overweight is a requirement for inclusion (e.g., in treatment trials; Agras et al., 1994).

Thus, it seems critical to perform studies of obese and nonobese people with BED in comparison with people with BN. This represents a natural extension and complement to the recent efforts comparing nonpurging BN with BED (Hay and Fairburn, 1998; Santonastaso et al., 1999; Striegel-Moore et al., 2001). In addition, although some work has compared risk factors (Fairburn et al., 1998), most studies to date comparing BED and BN have focused on the behavioral or cognitive features of eating disorders (Striegel-Moore et al., 2001; Wilfley et al., 2000) or of associated psychiatric comorbidity (Striegel-Moore et al., 2001). A complementary approach would be to compare BN and BED (considering obese and nonobese subgroups) on psychological variables potentially representing vulnerabilities (Grilo, 2002b). The present study aims to do this using the Eating Disorder Inventory (EDI; Garner et al., 1983). Although three EDI scales assess features of eating disorders, the remaining five scales assess more general personality features, some of which may represent vulnerabilities for the development or persistence of eating disorders (Lilenfeld et al., 1998; 2000). Last, this study considers the potential effects of depression, given its complex associations with eating-related psychopathology such as body dissatisfaction (Joiner et al., 1994; Joiner et al., 1995; Keel et al., 2001; Hurlley et al., 1990) and with personality disturbances (Grilo et al., 2000; Loranger et al., 1991; Zimmerman, 1994).

METHODS

Subjects

Subjects were 162 adult females who were consecutively evaluated for outpatient controlled clinical trials and met DSM-IV (American Psychiatric Association, 1994) criteria for either BED ($N = 116$) or BN, purging type ($N = 46$). Participants were age 18 to 60 years (mean, 38.7; SD, 10). Eighty-five percent ($N = 138$) of the women were Caucasian, 10% ($N = 16$) were African-American, 2.5% ($N = 4$) were Hispanic, and 2.5% ($N = 4$) were self-defined as "other." Fifty-one percent ($N = 83$) of the women were married, 34% ($N = 55$) were single, 14% ($N = 22$) were divorced, and 1% ($N = 2$) endorsed the "other" category.

The subjects with BED had a mean BMI (weight divided by height squared) of 34.9 (SD, 8.8), and the BN subjects had a mean BMI of 22.8 (SD, 9.5); this difference was statistically significant ($F[1,161] = 71.97, p < .001$). Using a BMI of 30 or more as a cutoff for obesity, of the 116 BED subjects, 68% ($N = 79$) were categorized as obese (mean, 39.2; SD, 7.2) and 32% ($N = 37$) as nonobese (mean, 25.9; SD, 3.2).

Procedures and Measures

Participants provided written informed consent. Participants were administered structured diagnostic and clinical interviews and completed a battery of self-report questionnaires. DSM-IV (American Psychiatric Association, 1994) diagnoses were determined by the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I/P; First et al., 1996). The SCID-I/P was reliably administered by trained and monitored Ph.D.-level research clinicians. Interrater reliability was good; Kappa coefficients ranged from .58 to 1.0 for all axis I diagnoses and .77 to 1.0 for eating disorder diagnoses. Final research diagnoses considered additional convergent data from independently administered clinical interviews and from relevant portions of two self-report instruments, the Questionnaire on Eating and Weight Patterns—Revised (QEWP-R; Yanovski, 1993) and the Eating Disorder Examination—Questionnaire (EDEQ; Fairburn and Beglin, 1994).

The EDI (Garner et al., 1983), a widely used 64-item self-report measure with eight subscales, was completed by participants. Three EDI subscales (drive for thinness, body dissatisfaction, and bulimia) tap attitudes, behaviors, and features of eating disorders. The other five subscales (ineffectiveness, perfectionism, interpersonal distrust, interoceptive awareness, and maturity fears) assess more general psychological traits or personality features that are conceptually or empirically related to eating disorders (Garner, 1991; Garner et al., 1998). Garner (1991) reported that the EDI possesses good psychometric properties, including excellent internal consistency (standardized alphas ranged from

.83 to .92 with eating disorder samples). The EDI has demonstrated good convergent and discriminant validity (e.g., Rathner and Rumpold, 1994) and has been used in studies of obesity and binge eating (Johnson and Torgrud, 1996). Recent empirical research has provided further support for the view that these psychological constructs may represent vulnerabilities for the development or persistence of eating disorders (Lilenfeld et al., 1998; 2000).

The Beck Depression Inventory (BDI; Beck and Steer, 1987), 21-item version, is a widely used and psychometrically well established (Beck et al., 1988) measure of the cognitive, affective, and somatic symptoms of depression. The BDI has demonstrated adequate internal consistency, reliability, and convergent validity (Beck et al., 1988). The BDI taps a broad range of negative affect—not just depressive affect—and can potentially influence self-reports of certain psychological and behavioral variables (Watson and Clark, 1984). In the present study, we administered the BDI to allow for controlling the effects of depression level on the group comparisons. This step seemed indicated given the complex associations between depression levels and body dissatisfaction across diagnostic groups (Hurley et al., 1990; Joiner et al., 1994; 1995) and because depression levels complicate the assessment of personality particularly by inflating self-report measures (Loranger et al., 1991; Zimmerman, 1994).

RESULTS

Table 1 summarizes the findings for the three groups (BN, obese BED, nonobese BED) on the EDI. Of the 37 patients with a BMI less than 30, 15 had a BMI between 27

and 30. Twenty-two patients had a BMI below 27, a widely used convention for overweight. We ran an exploratory series of parallel analyses using the 22 patients with a BMI below 27 as the nonobese study group; no differences on any variables or findings were obtained. Thus, we report here on findings for obese ($N = 79$) and nonobese ($N = 37$) BED groups (in addition to the BN group, $N = 46$). Analysis of variance (ANOVA) was used to test for group differences on the EDI subscales, and Scheffe post hoc tests were used to examine differences between specific groups.

As shown in Table 1, the three groups (BN, obese BED, and nonobese BED) differed significantly on two (drive for thinness and body dissatisfaction) of the three EDI eating-related scales. The BN group had the highest levels of disturbances for all the scales, except for body dissatisfaction. Scheffe post hoc tests revealed that the obese BED group had significantly lower drive for thinness than both the nonobese BED group (mean difference, 2.7; 95% confidence interval [CI], 14.06 to 17.02; $p < .05$) and the BN group (mean difference, 4.9; 95% CI, 16.78 to 18.61; $p < .001$); the BN and nonobese groups did not differ significantly from one another. Scheffe post hoc tests conducted on the body dissatisfaction scales revealed no significant differences between the specific groups, with the only notable finding a nonsignificant trend for the obese BED group to have higher scores than the BN group (mean difference, 1.98; 95% CI, $-.15$ to 4.10; $p = .07$).

As summarized in Table 1, the three groups differed significantly on all five EDI subscales that assess more general psychological and personality features. As summarized in Table 1, ANOVAs revealed significant overall group

TABLE 1. Comparison of Patients With BN, Obese Patients With BED, and Nonobese Patients With BED on EDI

EDI	BN ($N = 46$)		Obese BED ($N = 79$)		Nonobese BED ($N = 37$)		ANOVA		Analysis of Covariance With Age and BDI Covariates	
	Mean	SD	Mean	SD	Mean	SD	$F(2,159)$	P	$F(2,158)$	P
Eating-Related scales										
Drive for thinness	17.7 ^a	3.1	12.8 ^{ab}	4.8	15.5 ^b	4.5	20.11	.000	10.60	.000
Bulimia	13.7	5.7	13.3	4.0	12.6	4.9	0.54	.587	0.17	.847
Body dissatisfaction	21.6	5.8	23.6	4.4	23.8	3.2	3.16	.045	5.00	.008
Associated personality scales										
Interceptive awareness	17.0 ^a	7.6	10.8 ^a	6.7	13.4	8.0	10.78	.000	1.89	.155
Ineffectiveness	17.1 ^a	8.5	12.1 ^a	8.6	13.3	7.9	5.29	.006	1.14	.322
Interpersonal distrust	9.6 ^a	5.9	6.9 ^a	5.7	7.7	5.7	3.39	.036	0.40	.674
Maturity fears	9.8 ^{ab}	7.5	6.2 ^a	5.1	5.9 ^b	4.7	7.05	.001	5.39	.005
Perfectionism	10.3 ^a	4.5	7.7 ^a	5.1	8.8	5.8	3.71	.027	1.93	.148

^{ab}Scales with the same superscripts differ significantly from each other at $p < .05$ for two-tailed tests using Scheffe posthoc test; scales without superscripts do not differ significantly from other scales in that row.

differences for interoceptive awareness, ineffectiveness, interpersonal distrust, maturity fears, and perfectionism. Scheffé post hoc tests revealed that, whereas the BN group had significantly higher scores than the obese BED group for four scales (interoceptive awareness [mean difference, 6.2; 95% CI, 14.77 to 19.27; $p < .005$], ineffectiveness [mean difference, 5.0; 95% CI, 14.61 to 19.65; $p < .005$], interpersonal distrust [mean difference, 2.7; 95% CI, 7.66 to 11.19, $p < .05$], and perfectionism [mean difference, 2.6; 95% CI, 8.94 to 11.62; $p < .01$]), the BN group did not differ significantly from the nonobese BED group. The BN group had significantly higher maturity fears than both the obese BED group (mean difference, 3.6; 95% CI, 5.00 to 7.30; $p = .003$) and the nonobese BED group (mean difference, 3.9; 95% CI, 4.35 to 7.49; $p = .009$), which did not differ significantly from one another. The obese and nonobese BED groups also did not differ significantly from one another on interoceptive awareness, ineffectiveness, interpersonal distrust, or perfectionism.

Age and Depression Effects

The relevance of effects of age (Hurley et al., 1990; Keel et al., 2001) and depression (Joiner et al., 1994; 1995; Zimmerman, 1994) on the EDI eating and personality scales have been documented. Thus, we performed a series of analyses to determine meaningful differences between the study groups and to control for such effects. ANOVAs revealed that the three groups differed significantly in age ($F(2,159) = 26.78$; $p < .001$) and in depression scores on the BDI ($F(2,159) = 5.10$; $p = .007$). Scheffé post hoc tests revealed that the BN group was significantly younger [mean (years), 30.4; SD, 8.6] than the obese BED (mean, 42.7; SD, 8.5) and nonobese BED (mean, 38.5; SD, 10.6) groups, which did not differ significantly from each other. Similarly, the BN group had significantly higher BDI scores (mean, 24.9; SD, 13.0) than the obese BED (mean, 20.0; SD, 9.5) and nonobese BED (mean, 18.1; SD, 7.7) groups, which did not differ significantly from one another. In addition, this seemed further indicated because BDI scores were significantly correlated with all EDI scales (all $p < .007$). Thus, we compared the three groups using analyses of covariance with age and BDI scores as the covariates. As summarized in Table 1, when age and depression level were controlled, overall group findings for the three eating-related scales did not change, whereas four of the five general personality scales were no longer significant.

DISCUSSION

This study compared treatment-seeking women with BN and BED. This study extended previous work comparing BN and BED (Grilo, 1998) by considering physical differences (age and obesity status) and depression levels. Our approach of contrasting obese and nonobese patients with

BED to BN complements recent studies that compare non-purging BN to BED (Hay and Fairburn, 1998; Santonastaso et al., 1999; Striegel-Moore et al., 2001). Specifically, we compared patients with BN (purging type), obese patients with BED, and nonobese patients with BED using the EDI. The BN group was significantly younger and had higher levels of depression than the obese and nonobese groups, which did not differ on these variables. Although women who seek treatment for BN have higher levels of disturbances in personality functioning than those with BED, when the effects of age and depression levels are removed, women with BN and BED are generally similar. However, women with BN and BED differ in certain features, some associated with obesity status (drive for thinness) and others associated with diagnosis (body dissatisfaction, maturity fears).

Our analyses replicate certain findings in the literature, while clarifying other questions. First, our findings generally support the notion that BN is associated with greater psychological disturbance than BED (Grilo, 1998). Overall, patients with BN had higher BDI depression scores and higher disturbances on the five personality scales of the EDI, although the post hoc tests revealed that the significant differences were between the BN and obese BED groups. Indeed, the BN and the nonobese BED groups were quite similar on most measures.

Second, our analyses revealed that the obese BED group had significantly lower drive for thinness than the nonobese BED and the BN groups, whereas the BN and nonobese groups did not differ significantly from one another. These findings highlight previous findings suggesting that patients with BN have higher dietary restraint than patients with BED (Hay and Fairburn, 1998; Wilfley et al., 2000) and that the level of dietary restraint in patients with BED is associated with obesity (Masheb and Grilo, 2002). Clinically, this finding reinforces suggestions that interventions from the BN treatment literature adapted for patients with BED need to aim at structuring and normalizing eating throughout the day (Marcus, 1997). Indeed, although efficacious treatments for binge eating and associated psychological distress have been developed (Grilo, 1998), these treatments have generally been unsuccessful in reducing excess weight.

Third, our findings suggest that the levels of eating-related disturbances in BN and BED are comparable. This extends previous findings that both patient groups are similar in their eating disorder attitudinal psychopathology (Wilfley et al., 2000). Although obese people with BED may exhibit greater body dissatisfaction than their obese counterparts without BED (Grilo, 1998; Yanovski, 1993), results from this study indicate that obesity status did not significantly impact body dissatisfaction ratings in women with BED. Previously, Santonastaso et al. (1999) reported that patients with BED experience greater dissatisfaction than nonpurging patients

with BN, which they speculated could be a function of higher body weight among patients with BED. In the present study, we found that body dissatisfaction did not differ between obese and nonobese patients with BED and that their levels of body dissatisfaction were at least equal to those of patients with BN.

Lastly, we found that the BN group had significantly higher levels of maturity fears than the BED groups, even after controlling for the effects of age and depression level. The levels of maturity fears reported by the three patient groups in our study are slightly higher than the norms reported by Garner (1991) for patients with BN, and substantially higher than nonpatient norms. To our knowledge, this is a new finding that awaits replication. We can only speculate that patients with BN perhaps struggle with concerns about maturity, adulthood, and independence to a significantly greater degree than patients with BED.

We note the following context for considering our findings. The BN and BED groups were recruited concurrently for clinical trials and were assessed by the same research evaluation team using the same diagnostic instruments. This methodology should eliminate some potential selection and sampling confounds. However, several limitations should be noted. The present study sampled patients with BN and BED who sought treatment at a university hospital center. It is unclear whether the obtained results are generalizable to people with these eating disorders who do not seek treatment or who seek treatment at nonspecialty clinics. In the case of BN, one study found that patients who seek treatment at university treatment centers show some differences from community or other patient samples (Fairburn et al., 1996). However, Wilfley et al. (2001), in a comparison of women with BED from a recruited clinic sample with those of a community sample, failed to observe such meaningful differences or biases. Prospective longitudinal studies with repeated measures (Grilo et al., 2000) are needed to address the nature and course of these disorders more definitively. Future work should include repeated measurements of these factors over time and may include different comparison groups (e.g., obese people who do not binge eat).

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