Published in final edited form as:

Compr Psychiatry. 2013 April ; 54(3): 209–216. doi:10.1016/j.comppsy.2012.07.012.

Psychiatric Disorder Co-morbidity and Correlates in an Ethnically Diverse Sample of Obese Patients with Binge Eating Disorder in Primary Care Settings

Carlos M. Grilo^{1,2}, Marney A. White¹, Rachel D. Barnes¹, and Robin M. Masheb¹

¹Department of Psychiatry, Yale University School of Medicine, New Haven, Connecticut

Abstract

Objective—To examine DSM-IV lifetime/current psychiatric disorder co-morbidity and correlates in ethnically-diverse obese patients with binge eating disorder (BED) seeking treatment for obesity and binge eating in primary care.

Method—A consecutive series of 142 participants (43% Caucasian, 37% African-American, 13% Hispanic-American, and 7% “other” ethnicity) were evaluated with semi-structured interviews.

Results—67% of BED patients had at least one additional lifetime psychiatric disorder, with mood (49%), anxiety (41%), and substance-use (22%) disorders most common. In terms of current co-morbidity, 37% had at least one other psychiatric disorder, with anxiety (27%) and mood (17%) most common. Few gender differences were observed but psychiatric co-morbidity rates differed across ethnic/racial groups with larger differences for current diagnoses. African-American and Hispanic groups were more than twice as likely as the Caucasian group to have additional current psychiatric disorders, mood disorders, and anxiety disorders. Psychiatric co-morbidity was associated with greater eating-disorder psychopathology and poorer functioning, but not with binge-eating or BMI.

Conclusion—Our study presents new findings suggesting that among obese BED patients in primary care, ethnic/racial minority groups are more likely than Caucasian groups to present with psychiatric co-morbidity. *Within* BED, psychiatric co-morbidity shows few gender differences but is associated with greater eating-disorder psychopathology and poorer functioning.

Binge eating disorder (BED), a research category in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*) (1), is characterized by recurrent binge eating without inappropriate compensatory weight-control behaviors. BED is a prevalent problem strongly associated with obesity and psychosocial impairment (2). BED has distinctive psychopathology from other disordered eating groups (3, 4) that is significantly elevated relative to obese controls (5, 6). BED has been added as a formal diagnosis in the current proposal for *DSM-5* (www.dsm5.org) as critical reviews have concluded that sufficient evidence exists for BED to warrant its inclusion (7).

© 2012 Elsevier Inc. All rights reserved.

²**Corresponding Author:** Carlos M. Grilo, Ph.D., Department of Psychiatry, Yale University School of Medicine, 301 Cedar St., 2nd Floor, New Haven, CT 06519, carlos.grilo@yale.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

The study of diagnostic co-occurrence can contribute to developing models of etiology and has relevance for treatment formulation. Several studies have examined psychiatric comorbidity in patients with varying definitions of BED using various approaches to recruitment (e.g., community, convenience, treatment-seeking at research clinics), assessment (e.g., selfreport and interview methods), and comparison groups. We briefly note here the major findings from selected rigorous studies using diagnostic interviews. In the first controlled study of psychiatric co-morbidity in patients diagnosed with BED, Yanovski and colleagues (8) reported that 43 obese subjects with BED were significantly more likely to have co-occurring *DSM-III-R* defined psychiatric disorders than 85 obese subjects without BED (60% versus 34%, respectively). Wilfley and colleagues (9), in a study of 162 patients with BED participating in a clinical trial, found that 77% of the patients met criteria for at least one additional *DSM-III-R* lifetime psychiatric disorder; mood, substance-use, and anxiety disorders were most common (61%, 33%, and 29%, respectively). Hudson and colleagues (2) reported that 79% of persons with BED met criteria for at least one additional *DSM-IV* lifetime psychiatric disorder in the National Comorbidity Replication Study; anxiety, mood, and substance use were most common (65%, 46%, and 23%, respectively). Javaras and colleagues (10), in a community-based study, reported elevated rates of most psychiatric disorders in persons with BED relative to those without BED. Grilo and colleagues (11) in a study of 404 consecutive patients with BED assessed at a research clinic reported that 74% met criteria for at least one additional *DSM-IV* lifetime psychiatric disorder and that 43% had at least one additional current disorder. Lifetime-wise, mood, anxiety, and substance use disorders were most common (54%, 37%, and 25%, respectively) at rates that echo those of the previous reports.

Although research has consistently reported elevated rates of psychiatric co-morbidity in obese BED groups relative to obese groups (10), less is known about the significance of psychiatric co-morbidity *within* BED (within group correlates). The Wilfley et al (9) *DSM-III-R*-based study, but not the Grilo et al (11) *DSM-IV*-based study, found that overall lifetime psychiatric co-morbidity was significantly more likely in men than women, although both studies reported that men were significantly more likely to have lifetime histories of substance use disorders. Grilo et al. (11) and Wilfley et al (9) both found that psychiatric co-morbidity was unrelated to body mass index or to binge-eating frequency; however, Wilfley et al (9) reported no association with eating-disorder psychopathology whereas Grilo et al (11) found significant associations between current psychiatric co-morbidity and higher eating-disorder psychopathology, as did a smaller study by Peterson et al (12) based on self-report measures. Thus, relatively little is known regarding the nature and significance of *DSM-IV* psychiatric co-morbidity *within* patient groups with BED. The literature consistently highlights the high rates of co-occurring psychiatric disorders in BED but is mixed regarding the relationship of co-morbid conditions to eating-disorder psychopathology. The mixed findings are perhaps due in part to limited power of some studies and varied recruitment and assessment methods.

The present study examined psychiatric co-morbidity in an ethnically diverse sample of obese patients with BED seeking treatment for obesity and binge eating in primary care, which is important for several reasons. First, the existing clinical literature is based on samples of treatment-seekers from specialist research clinics (9, 11, 12) and those findings may not generalize adequately to other clinical settings due to various “clinic biases” (13, 14, 15). Second, the existing literature is based on samples comprised predominately of Caucasian participants and findings may not generalize to more diverse groups comprising different ethnic composition (16). Epidemiological studies have found that African American and Hispanic groups have comparable rates of binge-eating as Caucasians (17, 18) but in sharp contrast to such prevalence data, African-American and Hispanic persons have been vastly under-represented in clinical studies of BED at research clinics (16).

Epidemiological studies have also found that minority groups with binge-eating problems have lower mental health utilization rates than Caucasians and receive most of their health care from generalist or primary care settings rather than from specialist settings (18). Third, although BED appears to be common in primary care settings and associated with increased medical problems and service utilization (19), research has documented that general healthcare providers are unfamiliar with and often miss problems with BED (20) resulting in little available knowledge about this patient group.

Method

Participants

Participants were a consecutive series of 142 patients who were respondents for a treatment study for obese persons who binge eat being performed in primary care settings in a large university-based medical center in an urban setting. Participants were required to be obese (body mass index (BMI) ≥ 30) and meet proposed *DSM-5* criteria for BED. Unlike *DSM-IV* criteria for BED, which requires a minimum frequency of twice-weekly binge-eating, the *DSM-5* stipulates a minimum frequency of once-weekly binge-eating. This revision follows convergent empirical evidence and is intended to parallel the criteria for bulimia nervosa (7). Recruitment for the treatment study (designed as an “effectiveness” study) was intended to enhance generalizability and therefore included relatively few exclusionary criteria. Notable exclusion criteria included current antidepressant therapy, severe psychiatric problems (lifetime schizophrenia and bipolar disorders and current substance use dependence), severe medical problems (cardiac, liver disease), and uncontrolled hypertension, thyroid conditions, or diabetes. The study had full IRB approval and all participants provided written informed consent.

Overall, participants had a mean age of 43.6 years ($SD = 11.3$) and a mean BMI of 38.5 kg/m² ($SD = 5.5$). Seventy-four percent ($N=105$) were female and 26% ($N=37$) were male. In terms of ethnicity/race, 43% ($N=61$) were Caucasian, 37% ($N=52$) were African-American, 13% ($N=19$) were Hispanic-American, and 7% ($N=10$) were of “other” minority/ethnic groups.

Assessments and Measures

Participants were assessed by doctoral-level research-clinicians who were trained in the administration of the study’s measures. BED and axis I psychiatric diagnoses were determined using the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I/P) (21) and the Eating Disorder Examination (22) was used to assess eating-disorder psychopathology. Participants completed a battery of self-report measures and measurements of weight and height were obtained using a high-capacity digital scale.

Eating Disorder Examination (EDE)—(22) interview focuses on the previous 28 days, except for diagnostic items that are rated for relevant duration stipulations. The EDE assesses the frequency of different forms of overeating, including *objective bulimic episodes* (i.e., OBEs; eating unusually large quantities of food while experiencing a subjective sense of loss of control) which corresponds to the *DSM-IV* and *DSM-5* criterion for binge-eating. The EDE comprises four subscales: Restraint, Eating Concern, Shape Concern, and Weight Concern. The items assessing ED features for the four scales are rated on a 7-point forced-choice format (0 to 6), with higher scores reflecting greater severity or frequency. The EDE, an established method for assessing the specific features of eating disorders (23, 24) has shown good inter-rater and test-retest reliability with individuals with BED (25) and diverse ethnic groups (26). In the present study, inter-rater ($N=34$ ratings of taped interviews) reliability of the EDE was excellent. Interrater reliability intra-class correlation coefficients

(ICC) for OBE ranged from .83 (for episodes) to .90 (for days); for EDE scales, ICCs were: 0.92 (restraint), 0.71 (eating concern), 0.90 (weight concern), and 0.91 (shape concern).

Beck Depression Inventory (BDI—27) is a widely used 21-item measure of depressive symptoms, and - more generally - of negative affect and therefore is a useful marker for broad psychosocial distress (28). Studies with clinical samples have reported good internal consistency ($\alpha = .81$ to $.86$), test-retest reliability ($r = .48$ to $.86$), and convergent validity with clinician ratings ($r = .60$ to $.72$) (29). The *Rosenberg Self-Esteem Scale* (RSES) (30) is a well-established 10-item measure of global self-esteem, with good internal consistency and test-retest reliability (31).

Results

Lifetime Psychiatric Co-morbidity: Overall and By Gender

Table 1 summarizes the frequency of lifetime psychiatric disorders overall and separately by gender and findings from chi-square analyses testing for gender differences in the distribution of other disorders. Overall, 67% of BED patients had at least one additional lifetime psychiatric disorder. Mood disorders (49%) were most common, with major depressive disorder being the most common specific disorder (44%). Anxiety disorders (41%) were also quite common, with PTSD being the most common specific anxiety disorder (21%). Lifetime substance use disorders were common overall (22%); rates for alcohol use and drug use disorders were 13% and 16%, respectively. A lifetime history of other eating disorders was infrequent (3%). Chi-square analyses revealed no significant gender differences in the frequency of other lifetime disorders.

Current Psychiatric Co-morbidity: Overall and By Gender

Table 2 summarizes the frequency of current psychiatric disorders overall and separately by gender and chi-square analyses testing for gender differences in the distribution of other current disorders. Overall, 37% of BED patients had at least one additional current psychiatric disorder. Anxiety disorders (27%) were most common followed by mood disorders (17%); major depressive disorder was the most common specific disorder (15%). Chi-square analyses revealed that women were significantly more likely than men to meet criteria for current anxiety disorders overall (31% vs 14%) and for PTSD (12% vs 0%).

Lifetime Psychiatric Co-morbidity by Ethnicity/Race

Table 3 summarizes the frequency of lifetime psychiatric disorders separately by ethnicity/race. Chi-square analyses tested for group differences, comparing Caucasian ($N=61$), Black ($N=52$), and Hispanic ($N=19$) groups; we did not include the “other” mixed group because of its small number ($N=10$). Overall, lifetime anxiety disorders differed significantly across ethnic/racial groups; specific chi-square tests revealed the Hispanic group had significantly higher rates of anxiety disorders than the Caucasian group (63% vs 30%, chi-square (1, $N=80$) = 7.00, $p=.008$). In terms of specific anxiety disorders, post-traumatic stress disorder (PTSD) was found at significantly higher rates in the Hispanic (47%) group than the Caucasian (13%) group (chi-square (1, $N=80$) = 10.16, $p=.001$).

Current Psychiatric Co-morbidity by Ethnicity/Race

Table 4 summarizes the frequency of current psychiatric disorders separately by ethnicity/race and chi-square analyses testing for group differences between the Caucasian, Black, and Hispanic groups. Overall, the African-American (48%) and Hispanic (53%) groups were significantly more likely to meet criteria for an additional current psychiatric disorder than the Caucasian group (21%) (chi-square (1, $N=113$) = 7.84, $p = 0.005$ and chi-square (1,

$N=80$) = 6.94, $p=.008$, respectively). Overall, current anxiety disorders differed significantly across ethnic/racial groups. Specific chi-square tests revealed that the Hispanic group had significantly higher rates of anxiety disorders than the Caucasian group (47% vs 13%, chi-square (1, $N=80$) = 10.16, $p=.001$) and the African-American group had a higher rate than the Caucasian group (33% vs 13%; chi-square (1, $N=113$) = 6.25, $p=.012$). In terms of specific anxiety disorders, generalized anxiety disorder (GAD) was found at significantly higher rates in the Hispanic group (26%) than the Caucasian group (3%) (chi-square (1, $N=80$) = 9.63, $p=.002$) and the African-American group (2%) (chi-square (1, $N=71$) = 10.70, $p=.001$). PTSD was found at a significantly higher rate in the Hispanic group (26%) than the Caucasian group (5%) (chi-square (1, $N=80$) = 7.37, $p=.007$). Specific phobia was found at a significantly higher rate in the African-American group (21%) than the Caucasian group (5%) (chi-square (1, $N=113$) = 6.82, $p=.009$).

Factors Associated with Psychiatric Co-morbidity

Table 5 summarizes current clinical variables by psychiatric co-morbidity and statistical tests (ANOVAs with Scheffe post-hoc tests). Psychiatric co-morbidity was not significantly associated with BMI or binge-eating frequency but was significantly associated with greater eating-disorder psychopathology (EDE global score and EDE scales except for Restraint), higher depression, and lower self-esteem. Scheffe post-hoc tests revealed that the significant elevations were associated with current psychiatric co-morbidity and that the two other BED groups (patients with lifetime co-morbidity or patients without any co-morbidity) did not differ significantly from each other.

Discussion

This study assessed *DSM-IV* lifetime and current psychiatric disorder co-morbidity in ethnically diverse obese patients with BED seeking treatment in primary care. Much like findings reported from research and specialty clinics (11) patients with BED who present for treatment at primary care settings frequently have additional lifetime and current psychiatric disorders. Overall, 67% of BED patients had at least one additional lifetime psychiatric disorder and 37% had at least one current psychiatric disorder. Lifetime-wise, mood (49%), anxiety (41%), and substance use (22%) disorders were most common. In terms of current co-morbidity, anxiety (27%) and mood (17%) were most common. Very few gender differences were observed: none for lifetime rates but women had higher current rates of anxiety disorders overall and PTSD specifically. Our study presents new findings suggesting significant ethnic/racial differences in psychiatric co-morbidity exist in obese minority groups with BED with larger differences observed for current disorders. African-American and Hispanic groups were more than twice as likely as the Caucasian group to meet criteria for an additional current psychiatric disorder, a mood disorder, and an anxiety disorder. Psychiatric co-morbidity was unrelated to BMI or binge-eating frequency but BED patients with current psychiatric co-morbidity had significantly higher levels of current eating-disorder psychopathology and depressive/negative affect and lower levels of self-esteem relative to BED patients with either lifetime (non-current) or no psychiatric histories.

Our observed overall rates of *DSM-IV* psychiatric disorders in this ethnically diverse clinical sample with BED recruited from primary care are generally comparable to those reported previously for BED including our previous *DSM-IV* study at a specialty clinic (11), by the National Co-morbidity Survey replication (2), and to those from a community-based study (10). The generally comparable overall rates of psychiatric co-morbidity observed in our study group relative to the above BED literature, however, reflects substantial elevations particularly in anxiety disorder co-morbidity in the African-American and Hispanic groups. The observed rates of mood disorders and anxiety disorders in our treatment-seeking BED group are substantially elevated (two-to-three fold) relative to epidemiologic survey studies

of psychiatric disorders across ethnic/racial groups (e.g., 32, 33, 34). Reasons for the elevated rates of comorbid psychiatric problems observed among the ethnic/racial groups in this study are unclear. The findings could perhaps simply reflect treatment-seeking confounds; for example, it has been reported that minority groups with eating disorders tend to seek most of their mental health care in general family and primary care settings (18). Further research is needed to understand potential mechanisms underlying BED and psychiatric comorbidity and whether such mechanisms/pathways differ by ethnic/racial status.

Our findings suggest that BED patients with additional current psychiatric disorders have elevated levels of eating disorder psychopathology, higher depression scores, and lower self-esteem relative to patients with lifetime histories of psychiatric disorders, who – in turn – differed little from those without any history of psychiatric disorders. These findings, which replicate our previous findings in a specialty clinic (11) clarify the literature further and provide important guidance to clinicians. Two previous studies produced mixed findings in this regard. One study (9) reported that lifetime psychiatric co-morbidity was unrelated to eating-disorder psychopathology whereas a second smaller study (12) found that lifetime co-morbid *DSM-IV* disorders were associated with significantly elevated levels of distress and eating-disorder psychopathology assessed with self-report measures. Our findings, based primarily on semistructured interviews, suggest that *current* psychiatric co-morbidity, but not past or lifetime history of psychiatric disorders, is associated with a more severe current presentation of BED and its associated features. The literature of the prognostic significance of psychiatric comorbidity in patients with BED is limited but critical inspection reveals few reliable predictors and little evidence that co-morbidity is a negative prognostic indicator when evidence-based treatments are delivered (35, 36).

Although epidemiological studies have found that binge-eating occurs among African-American and Hispanic-American groups at rates comparable to Caucasian groups (17, 18), most of the literature is based on research performed at specialty clinics comprising predominately and disproportionately Caucasian participants (16). This study demonstrated the feasibility of recruiting an ethnically-diverse treatment-seeking sample of obese patients with BED in the primary care setting. Another strength of this study was that the same state-of-the-art measures administered by doctoral research clinicians in specialty clinic studies (e.g., 11) were used in this primary care study, thus allowing for comparisons across the literature.

We observed a sharp discrepancy between the rates of lifetime and current substance use disorders in our study group which likely reflects our exclusionary criterion of current substance dependence (lifetime substance dependence was not exclusionary nor was current substance abuse). This represents a limitation for interpreting our findings regarding current rates of SUD. Interestingly, this apparent discrepancy between lifetime versus current rates of SUD has been previously reported in co-morbidity in extremely obese bariatric surgery candidates (37, 38) and epidemiological (39) and clinical studies with medical (40) and psychiatric (41) patients have reported inverse relations between obesity and SUD. Having noted this, we again emphasize our exclusion criterion of current substance dependence and also stress the importance of considering other possible alternative explanations which would require prospective longitudinal studies to resolve. For example, the observed patterns of low rates of current SUD could simply reflect age effects (i.e., substance use tends to be more frequent in younger persons whereas mood, anxiety, and binge-eating disorders are all distributed throughout adulthood, thus leading to discrepancies in observed rates). In addition, there exist other possible treatment-seeking biases (i.e., patients with current substance dependence might be less likely to seek treatment for BED).

Several additional potential limitations are also noteworthy. Participants were respondents to recruitment flyers placed in primary care centers advertising a treatment study for overweight persons who binge-eat. Thus, findings may not generalize to obese BED patients in primary care who do not perceive themselves to be overweight, choose not to seek treatment for eating/weight issues, or are uninterested or unwilling to participate in research studies. Although we adopted relatively few exclusionary criteria, notable exclusion criteria included current antidepressant therapy, cardiac and liver disease, and uncontrolled hypertension, thyroid conditions, or diabetes. Our lack of a non-BED obese comparison group is another relative limitation although our focus was on *within*-group analyses to understand gender, ethnic/racial, and clinical correlates of psychiatric co-morbidity. Given our exclusionary criteria for psychotic and bipolar disorders, we cannot comment on the co-occurrence of those serious psychiatric illnesses in BED, although exclusions for those reasons were exceedingly rare as reported by other research groups (9). However, we note that two community-based studies reported lifetime bipolar disorder rates ranging from 10.9% to 12.5% among persons with BED (2, 10) suggesting that such psychiatric conditions should not be neglected or overlooked by clinicians. Our findings may not generalize to younger (e.g., adolescent) or elderly groups. Lastly, our crosssectional analysis precludes any statements regarding the prognostic significance of psychiatric co-morbidity for either obesity or BED outcomes in primary care settings and future research should examine its utility as a predictor/moderator of outcomes.

In summary, our findings highlight the importance for clinicians to systematically assess for additional *current* psychopathology in patients who present for treatment with BED. This may be especially important for clinicians working with ethnic/racial minority groups given our findings of elevated rates of some psychiatric disorders relative to Caucasian groups. Our findings also indicate the need for research to examine the implications of current co-morbidity for treatment delivery and outcome.

Acknowledgments

This study was supported by the National Institutes of Health (R01 DK073542). Dr. Grilo, was also supported by National Institutes of Health grant K24 DK070052 and Dr. Barnes by, National Institutes of Health grant K23 DK092279.

References

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM-IV). 4th ed. Washington, DC: Author; 1994.
2. Hudson JI, Hiripi E, Pope HG, Kessler RC. The prevalence and correlates of eating disorders in the NCS Replication. *Biol Psychiatry*. 2007; 61:348–358. [PubMed: 16815322]
3. Allison KC, Grilo CM, Masheb RM, Stunkard AJ. Binge eating disorder and night eating syndrome: a comparative study of disordered eating. *J Consult Clin Psychol*. 2005; 73:1107–1115. [PubMed: 16392984]
4. Grilo CM, Crosby RD, Masheb RM, et al. Overvaluation of shape and weight in binge eating disorder, bulimia nervosa, and sub-threshold bulimia nervosa. *Behav Res Ther*. 2009; 47:692–696. [PubMed: 19552897]
5. Grilo CM, Hrabosky JI, Allison KC, Stunkard AJ, Masheb RM. Overvaluation of shape and weight in binge eating disorder and overweight controls: refinement of a diagnostic construct. *J Abnorm Psychol*. 2008; 117:414–419. [PubMed: 18489217]
6. Grilo CM, Masheb RM, White MA. Significance of overvaluation of shape/weight in binge-eating disorder: comparative study with overweight and bulimia nervosa. *Obesity*. 2010; 18:499–504. [PubMed: 19713949]
7. Wonderlich SA, Gordon KH, Mitchell JE, Crosby RD, Engel SG. The validity and clinical utility of binge eating disorder. *Int J Eat Disord*. 2009; 42:687–705. [PubMed: 19621466]

8. Yanovski SZ, Nelson JE, Dubbert BK, Spitzer RL. Association of binge eating disorder and psychiatric comorbidity in obese subjects. *Am J Psychiatry*. 1993; 150:1472–1479. [PubMed: 8379549]
9. Wilfley DE, Friedman MA, Douchis J, Stein R, Welch R, Ball S. Comorbid psychopathology in binge eating disorder: relation to eating disorder severity at baseline and following treatment. *J Consult Clin Psychol*. 2000; 68:641–649. (2000). [PubMed: 10965639]
10. Javaras KN, Pope HG, LaLonde JK, Roberts JL, Nillni YI, Laird NM, Bulik CM, Crow SJ, McElroy SL, Walsh BT, Tsuang MT, Rosenthal NR, Hudson JI. Co-occurrence of binge eating disorder with psychiatric and medical disorders. *J Clin Psychiatry*. 2008; 69:266–273. [PubMed: 18348600]
11. Grilo CM, White MA, Masheb RM. DSM-IV psychiatric disorder comorbidity and its correlates in binge eating disorder. *Int J Eat Disord*. 2009; 42:228–234. [PubMed: 18951458]
12. Peterson CB, Miller KB, Crow SJ, Thuras P, Mitchell JE. Subtypes of binge eating disorder based on psychiatric history. *Int J Eat Disord*. 2005; 38:273–276. (2005). [PubMed: 16142786]
13. Grilo CM, Lozano C, Masheb RM. Ethnicity and sampling bias in binge eating disorder. *Int J Eat Disord*. 2005; 38:257–262. [PubMed: 16211631]
14. Pike KM, Dohm FA, Striegel-Moore RH, Wilfley DE, Fairburn CG. A comparison of black and white women with binge eating disorder. *Am J Psychiatry*. 2001; 158:1455–1460. [PubMed: 11532731]
15. Wilfley DE, Pike KM, Dohm FA, Striegel-Moore RH, Fairburn CG. Bias in binge eating disorder: how representative are recruited clinic samples? *J Consult Clin Psychol*. 2001; 69:383–388. [PubMed: 11495168]
16. Franko DL, Thompson-Brenner H, Thompson DR, et al. Racial/ethnic differences in adults in randomized clinical trials of binge eating disorder. *J Consult Clin Psychol*. 2012; 80:186–195. [PubMed: 22201327]
17. Alegria M, Woo M, Cao Z, Torres M, Meng XL, Striegel-Moore RH. Prevalence and correlates of eating disorders in Latinos in the United States. *Int J Eat Disord*. 2007; 40:S15–S21. [PubMed: 17584870]
18. Marques L, Alegria M, Becker AE, Chen CN, Fang A, Chosak A, Diniz JB. Comparative prevalence, correlates of impairment, and service utilization for eating disorders across US ethnic groups: implications for reducing ethnic disparities in health care access for eating disorders. *Int J Eat Disord*. 2010; 44:412–420. [PubMed: 20665700]
19. Johnson JG, Spitzer RL, Williams JB. Health problems, impairment and illnesses associated with bulimia nervosa and binge eating disorder among primary care and obstetric gynaecology patients. *Psychol Med*. 2001; 31:1455–1466. [PubMed: 11722160]
20. Crow SJ, Levine AS, Thuras P, Mitchell JE. A survey of binge eating and obesity treatment practices among primary care providers. *Int J Eat Disord*. 2004; 35:348–353. [PubMed: 15048950]
21. First, MB.; Spitzer, RL.; Gibbon, M.; Williams, JBW. Structured Clinical Interview for DSM-IV Axis I Disorders Patient-Version (SCID-I/P). New York: NYSPI; 1996.
22. Fairburn, CG.; Cooper, Z. The Eating Disorder Examination. In: Fairburn, CG.; Wilson, GT., editors. *Binge eating: Nature, assessment, and treatment*. 12th ed. New York: Guilford Press; 1993. p. 317-360.
23. Grilo CM, Masheb RM, Wilson GT. A comparison of different methods for assessing the features of eating disorders in patients with binge eating disorder. *J Consult Clin Psychol*. 2001; 69:317–322. [PubMed: 11393608]
24. Grilo CM, Masheb RM, Wilson GT. Different methods for assessing the features of eating disorders in patients with binge eating disorder: a replication. *Obesity Res*. 2001; 9:418–422.
25. Grilo CM, Masheb RM, Lozano-Blanco C, Barry DT. Reliability of the Eating Disorder Examination in patients with binge eating disorder. *Int J Eat Disord*. 2004; 35:80–85. [PubMed: 14705160]
26. Grilo CM, Lozano C, Elder KA. Inter-rater and test-retest reliability of the Spanish-language version of the Eating Disorder Examination interview. *J Psychiatr Pract*. 2005; 11:231–240. [PubMed: 16041233]

27. Beck, AT.; Steer, R. Manual for revised Beck Depression Inventory. New York: Psychological Corporation; 1987.
28. Grilo CM, Masheb RM, Wilson GT. Subtyping binge eating disorder. *J Consult Clin Psychol.* 2001; 69:1066–1072. [PubMed: 11777111]
29. Beck AT, Steer R, Garbin M. Psychometric properties of the Beck Depression Inventory: 25 years of evaluation. *Clin Psychol Rev.* 1988; 8:77–100.
30. Rosenberg, M. Society and the adolescent self-image. Princeton: Princeton Univ.; 1965.
31. Griffith RA, Beumont EG, Russell J, Schotte D, Thornton C, Touyz SW, Varano P. Measuring self-esteem in dieting disordered patients: the validity of the Rosenberg and Coppersmith contrasted. *Eat Disord.* 1999; 25:227–231.
32. Alegria M, Mulvaney-Day N, Torres M, Polo A, Cao Z, Canino G. Prevalence of psychiatric disorders across Latino subgroups in the United States. *Am J Pub Health.* 2007; 97:68–75. [PubMed: 17138910]
33. Asnaani A, Richey JA, Dimaite R, Hinton DE, Hofmann SG. A cross-ethnic comparison of lifetime prevalence rates of anxiety disorders. *J Nerv Ment Dis.* 2010; 198:551–555. [PubMed: 20699719]
34. Williams DR, Gonzalez HM, Neighbors H, Nesse R, Abelson JM, Sweetman J, Jackson JS. Prevalence and distribution of major depressive disorder in African-Americans, Caribbean Blacks, and non-Hispanic Whites. *Arch Gen Psychiatry.* 2007; 64:305–315. [PubMed: 17339519]
35. Masheb RM, Grilo CM. Examination of predictors and moderators for self-help treatments of binge-eating disorder. *J Consult Clin Psychol.* 2008; 76:900–904. [PubMed: 18837607]
36. Grilo CM, Masheb RM, Crosby RD. Predictors and moderators of response to cognitive behavioral therapy and medication for the treatment of binge eating disorder. *J Consult Clin Psychol.* (in press).
37. Kalarchian MA, Marcus MD, Levine MD, Courcoulas AP, Pilkonis PA, Ringham RM, Soulakova JN, Weissfeld LA, Rofey DL. Psychiatric disorders among bariatric surgery candidates: relationship to obesity and functional health status. *Am J Psychiatry.* 2007; 164:328–334. [PubMed: 17267797]
38. Rosenberger PH, Henderson KE, Grilo CM. Psychiatric disorder co-morbidity and association with eating disorders in bariatric surgery patients: a cross-sectional study using structured interview-based methods. *J Clin Psychiatry.* 2006; 67:1080–1085. [PubMed: 16889451]
39. Simon GE, Von Korff M, Saunders K, Miglietti DL, Crane PK, van Belle G, Kessler RC. Association between obesity and psychiatric disorders in the US adult population. *Arch Gen Psychiatry.* 2006; 63:824–830. [PubMed: 16818872]
40. Kleiner KD, Gold MS, Frost-Pineda K, et al. Body mass index and alcohol use. *J Addict Disord.* 2004; 23:105–118.
41. McIntyre RS, McElroy SL, Konarski JZ, Soczynska JK, Bottas A, Castel S, Wilkins K, Kennedy SH. Substance use disorders and overweight/obesity in bipolar I disorder: preliminary evidence for competing addictions. *J Clin Psychiatry.* 2007; 68:1352–1357. (2007). [PubMed: 17915973]

Table 1

Lifetime DSM-IV Psychiatric Disorders in Patients with BED: Overall and By Gender (N=142)

Lifetime Psychiatric Disorders	Total (N=142)		Male (N=37)		Female (N=105)		χ^2	p
	N	%	N	%	N	%		
Any Axis I Disorder	95	66.9	25	67.6	70	66.7	0.01	.92
All Mood Disorders	69	48.6	17	45.9	52	49.5	0.14	.71
Major depressive disorder	62	43.7	17	45.9	45	42.9	0.35	.56
Dysthymic disorder *	4	2.8	0	0	4	3.8	1.45	.23
Depressive disorder NOS	5	3.5	0	0	5	4.8	1.83	.18
All Anxiety Disorders	58	40.8	11	29.7	47	44.8	2.56	.11
Panic disorder	17	12.0	4	10.8	13	12.4	0.06	.80
Social phobia	13	9.2	2	5.4	11	10.5	0.85	.36
OCD	12	8.5	3	8.1	9	8.6	0.01	.93
PTSD	30	21.1	5	13.5	25	23.8	1.74	.19
GAD *	10	7.0	1	2.7	9	8.6	1.44	.23
Specific phobia/Anxiety NOS	16	11.3	1	2.7	15	14.3	3.67	.06
Substance Use Disorders	31	21.8	11	29.7	20	19.0	1.83	.18
Alcohol abuse/dependence	18	12.7	7	18.9	11	10.5	1.76	.18
Drug abuse/dependence	22	15.5	7	18.9	15	14.3	0.45	.50
Other Eating Disorders	4	2.8	1	2.7	3	2.9	0.00	.96
Anorexia nervosa	0	0	0	0	0	0	--	--
Bulimia nervosa	4	2.8	1	2.7	3	2.9	0.00	.96

Note

* Dysthymic disorder and GAD (generalized anxiety disorder) figures are limited to presence of current status only (per DSM-IV and SCID-I/P rules) but used in the calculation of "All Mood Disorder" and "All Anxiety Disorder" totals, respectively. NOS = not otherwise specified; OCD = obsessive compulsive disorder; PTSD = post-traumatic stress disorder.

Table 2

Current DSM-IV Psychiatric Disorders in Patients with BED: Overall and by Gender (N=142)

Current Psychiatric Disorders	Total (N=142)		Male (N=37)		Female (N=105)		χ^2	P
	N	%	N	%	N	%		
Any Axis I Disorder	52	36.6	10	27.0	42	40.0	1.98	.16
All Mood disorders	24	16.9	6	16.2	18	17.1	0.02	.90
Major depressive disorder	21	14.8	6	16.2	15	14.3	0.08	.78
Dysthymic disorder	4	2.8	0	0	4	3.8	1.45	.23
All Anxiety Disorders	38	26.8	5	13.5	33	31.4	4.48	.03
Panic disorder	5	3.5	0	0	5	4.8	1.83	.18
Social phobia	9	6.3	1	2.7	8	7.6	1.11	.29
OCD	10	7.0	2	5.4	8	7.6	0.21	.65
PTSD	13	9.2	0	0	13	12.4	5.04	.03
GAD	10	7.0	1	2.7	9	8.6	1.44	.23
Specific phobia/Anxiety NOS	16	11.3	1	2.7	15	14.3	3.67	.06
Substance Use Disorders	1	0.7	0	0	1	1.0	0.36	.55
Alcohol abuse	1	0.7	0	0	1	1.0	0.36	.55
Drug abuse	1	0.7	0	0	1	1.0	0.36	.55

Note: OCD = obsessive compulsive disorder; PTSD = post-traumatic stress disorder; GAD = generalized anxiety disorder; NOS = not otherwise specified

Table 3Lifetime DSM-IV Psychiatric Disorders in Patients with BED by Ethnicity/Race (*N*=132)

Lifetime Psychiatric Disorders	African-American (<i>N</i> =52)		Caucasian (<i>N</i> =61)		Hispanic-American (<i>N</i> =19)		χ^2	<i>P</i>
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%		
Any Axis I Disorder	37	71.2	38	62.3	15	78.9	2.20	.33
All Mood disorders	29	55.8	27	44.3	10	52.6	1.55	.46
Major depressive disorder	26	50.0	26	42.6	8	42.1	0.72	.70
Dysthymic disorder *	1	1.9	0	0	3	15.8	12.65	.00
Depressive disorder NOS	2	3.8	1	1.6	1	5.3	0.84	.66
All Anxiety Disorders	24	46.2	18	29.5	12	63.2	7.76	.02
Panic disorder	5	9.6	7	11.5	3	15.8	0.53	.77
Social phobia	3	5.8	5	8.2	3	15.8	1.83	.40
OCD	6	11.5	3	4.9	1	5.3	1.93	.38
PTSD	13	25.0	8	13.1	9	47.4	9.93	.007
GAD *	1	1.9	2	3.3	5	26.3	16.09	.000
Specific phobia/Anxiety NOS	11	21.2	3	4.9	2	10.5	7.00	.03
Substance Use Disorders	17	32.7	11	18.0	2	10.5	5.32	.07
Alcohol abuse/dependence	9	17.3	7	11.5	2	10.5	0.99	.61
Drug abuse/dependence	13	25.0	7	11.5	1	5.3	5.72	.06
Other Eating Disorders	2	3.8	2	3.3	0	0	0.72	.70
Anorexia nervosa	0	0	0	0	0	0	--	--
Bulimia nervosa	2	3.8	2	3.3	0	0	0.72	.70

Note

* Dysthymic disorder and GAD (generalized anxiety disorder) figures are limited to presence of current status only (per *DSM-IV* and *SCID-I/P* rules) but used in the calculation of "All Mood Disorder" and "All Anxiety Disorder" totals, respectively. NOS = not otherwise specified; OCD = obsessive compulsive disorder; PTSD = post-traumatic stress disorder.

Table 4Current DSM-IV Psychiatric Disorders in Patients with BED by Ethnicity/Race ($N=132$)

Current Psychiatric Disorders	African-American ($N=52$)		Caucasian ($N=61$)		Hispanic-American ($N=19$)		χ^2	p
	N	%	N	%	N	%		
Any Axis I Disorder	25	48.1	13	21.3	10	52.6	11.23	.004
All Mood Disorders	11	21.2	6	9.8	7	36.8	7.61	.02
Major depressive disorder	10	19.2	6	9.8	5	26.3	3.65	.16
Dysthymic disorder	1	1.9	0	0	3	15.8	12.65	.002
All Anxiety Disorders	17	32.7	8	13.1	9	47.4	11.05	.004
Panic disorder	2	3.8	1	1.6	2	10.5	3.14	.21
Social phobia	2	3.8	3	4.9	3	15.8	3.75	.15
OCD	5	9.6	3	4.9	1	5.3	1.06	.59
PTSD	5	9.6	3	4.9	5	26.3	7.48	.02
GAD	1	1.9	2	3.3	5	26.3	16.09	.000
Specific phobia/Anxiety NOS	11	21.2	3	4.9	2	10.5	7.00	.030
Substance Use Disorders	1	1.9	0	0	0	0	1.55	.46
Alcohol abuse	1	1.9	0	0	0	0	1.55	.46
Drug abuse	1	1.9	0	0	0	0	1.55	.46

Table 5
Psychiatric Co-morbidity Relationship to Current Clinical Variables in Patients with BED ($N=142$)

	Total ($N=142$)		Never ($N=47$)		Lifetime ($N=43$)		Current ($N=52$)		<i>F</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Current body mass index	38.5	5.5	37.9	5.6	38.0	5.1	39.4	5.7	1.10	0.34
Binge-eating frequency (month)	18.5	15.9	15.9	13.9	18.0	14.3	21.2	18.6	1.41	0.25
EDE Restraint	1.6	1.3	1.4	1.1	1.7	1.4	1.8	1.4	1.54	0.22
EDE Eating Concern	1.8	1.2	1.5 ^a	1.1	1.7	1.1	2.2 ^b	1.4	3.85	0.02
EDE Shape Concern	3.4	1.3	3.2 ^a	1.2	3.2 ^a	1.2	3.9 ^b	1.3	5.36	0.01
EDE Weight Concern	3.1	1.1	2.9 ^a	1.0	2.9 ^a	1.0	3.5 ^b	1.2	6.40	0.00
EDE Global Score	2.5	0.9	2.2 ^a	0.7	2.4 ^a	0.8	2.9 ^b	1.0	6.70	0.00
Beck Depression Inventory	14.8	9.8	11.0 ^a	7.3	13.4 ^a	7.7	19.5 ^b	11.6	10.77	0.00
Rosenberg Self-Esteem	29.6	6.6	32.0 ^a	6.0	31.2 ^a	5.8	26.1 ^b	6.3	13.05	0.00

Note. Different superscripts denote significant ($p<.05$) post-hoc Scheffe contrasts. EDE = Eating Disorder Examination.