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Clinical Utility of Subtyping Binge Eating Disorder by History of Anorexia or Bulimia Nervosa in a Treatment Sample

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Abstract

Objective—This study examined whether having a history of anorexia nervosa (AN) or bulimia nervosa (BN) is associated with response to treatment in adults with binge eating disorder (BED).

Method—Data from 189 adults diagnosed with BED who were randomly assigned to one of three group cognitive-behavioral (CBT) treatments were analyzed to compare those with and without a history of AN/BN.

Results—A total of 16% of the sample had a history of AN/BN. The BED subgroup with a history of AN/BN presented with higher rates of mood disorders and greater eating-related symptom severity at baseline. Participants with a history of AN/BN also had higher global eating disorder (ED) symptoms at end of treatment (EOT), and more frequent objective binge-eating episodes at EOT and 12-month follow-up.

Discussion—These findings suggest that in adults with BED, a history of AN/BN is predictive of greater eating-related symptom severity following group-based CBT and poorer short- and long-term binge-eating outcomes. These findings suggest that considering ED history in the treatment of adults with BED may be clinically useful.

Longitudinal evidence suggests that individuals with binge eating disorder (BED) commonly have a history of bulimia nervosa (BN)^{1–4} and that the transition from BN to BED is associated with higher BMI, earlier onset, greater eating concerns, and depression.³ In contrast, cross-sectional data suggest that current psychiatric comorbidity in BED is more strongly associated with greater eating disorder (ED) symptom severity, earlier onset of dieting, and depression than past psychiatric comorbidity in BED, including ED history.⁵ However, ED history in this study was grouped together with all lifetime psychiatric disorders, precluding our understanding of the specific impact of ED history on BED

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symptomatology. Although individuals with BED appear to have better remission rates than individuals with anorexia nervosa (AN) or BN,⁶⁻⁷ it is unknown whether the treatment outcomes for those with BED who have a history of AN or BN differ from those who do not have a history of another ED.

Research on the transition between AN and BN indicates that having a prior ED may impact treatment outcome. Among individuals with BN, a history of AN is common^{2,8-9} and is associated with comorbid psychopathology,^{3,10} lower BMI,¹⁰⁻¹³ and greater body dissatisfaction.¹¹ While some evidence suggests that those with BN who have a history of AN may have worse outcomes,^{8,14-15} one comprehensive review concluded that having a history of AN did not predict poorer outcomes in BN.¹⁶ The transition from BN to AN is less common,^{4,6,8,16} but also associated with comorbid psychopathology.^{3,17-18} Despite inconsistent findings in BN and a paucity of findings in AN, this body of research on the impact of ED history on outcome may have implications for BED treatment.

The treatment outcomes associated with a lifetime history of AN or BN in those with BED are unknown. Although AN and BN are distinct diagnostic categories, the high rates of crossover between these diagnoses and similarities in the clinical features associated with such transitions suggest that having an ED history may have important implications for the treatment of BED. The primary aims of this study were to compare the baseline differences and treatment outcomes of two BED subgroups, those with and without an ED history (i.e., lifetime AN or BN), who received group cognitive-behavioral treatment (CBT). An additional objective was to examine whether any between-group differences were independent of lifetime major depressive disorder (MDD), which is the most common comorbid diagnosis in EDs.^{14,19} We hypothesized that individuals with a history of AN/BN would have greater ED symptom severity and psychiatric comorbidity at baseline, as well as earlier onset of dieting. Given that eating-related symptom severity has been found to be predictive of poorer treatment outcome,²⁰ we also hypothesized that individuals with BED who have a history of AN/BN would have poorer treatment outcomes than those without a history of AN/BN.

Method

Participants

Participants (N=189) were adults enrolled in a randomized clinical trial (RCT) comparing three group CBT treatments for BED from July 2002 to December 2007. The mean age of the sample was 46.7 years (SD=10.2), mean body mass index (BMI) was 39.3 (SD=8.1), 90% were female (N=170), and 96% were Caucasian. The original study was approved by the institutional review boards at both study sites and written informed consent was obtained from all participants. Additional information about recruitment, assessment, and treatment is provided in the original report of this RCT (see Peterson, Mitchell, Crow, Crosby, & Wonderlich, 2009; clinicaltrials.gov identifier NCT00041743).²¹

Measures

Structured Clinical Interview for DSM-IV Axis I Disorders, Research Version, Patient Edition (SCID-I/P)—The SCID-I/P is a structured interview used to determine DSM-IV diagnoses.²² The SCID-I/P has good to moderate inter-rater reliability²³ and was used at the start of treatment to assess current and lifetime history of Axis I diagnoses, including mood and anxiety disorders, and AN, BN, and BED.

Eating Disorder Examination (EDE)—The EDE is a standardized semi-structured interview used to assess the frequency and severity of eating-related disturbances, including frequency of objective binge episodes (OBEs) during the past 28-days.²⁴ The EDE has been shown to have good validity and reliability²⁵ and was completed at baseline, end-of-treatment (EOT), 6-month, and 12-month follow-up. Inter-rater reliability (based on intraclass correlation coefficients) for the subscales and global score ranged from 0.955 to 0.982.

Statistical Analyses

The original study included 259 adults with BED who were randomized to one of three group CBT treatments or to a waitlist control. This study included only those who were randomized to active treatment (N=190). One participant was missing lifetime diagnostic information required for classification based on ED history and was excluded. The final sample (N=189) were included in all analyses and missing outcome data were automatically excluded from the models.

BED subgroups were determined by lifetime EDs reported on the SCID-I/P, with those reporting a history of full AN or BN or subthreshold AN or BN forming one group and those without a history of AN/BN forming the other. In the current study, several possible symptom constellations were possible in diagnosing subthreshold AN or BN, with subthreshold AN defined as meeting all but one DSM-IV criteria (e.g., no amenorrhea, absence of cognitive symptoms) and subthreshold BN defined as meeting all but one DSM-IV criteria (e.g., binge eating and/or purging was present but below required frequency, absence of cognitive symptoms). Baseline demographic and clinical characteristics were compared across the two subgroups using chi square for categorical variables and analysis of variance for continuous variables.

Primary outcome variables were abstinence from objective binge episodes (OBEs), frequency of OBEs, and EDE global score at EOT, 6-month, and 12-month follow-up. Secondary analyses examined outcomes on the EDE subscales, Restraint, Shape Concern, Weight Concern, and Eating Concern. Twenty one generalized linear models were used to compare the two subgroups on each outcome variable at each of the three outcome periods. Given the number of analyses, the alpha level was set at .01. Analyses of treatment outcome controlled for baseline values of the respective outcome variables (e.g., OBE frequency). All analyses controlled for lifetime history of MDD. Because outcome varied by treatment group at EOT in the main paper, with those in the therapist-led group achieving higher rates of binge eating abstinence (see Peterson, Mitchell, Crow, Crosby, & Wonderlich, 2009),²¹ all

analyses of outcome also controlled for treatment condition. Negative binomial with log link models were used for all count variables.

Results

Diagnostic History

Four (2.1%) participants had a lifetime diagnosis of full- or sub-threshold AN and 27 (14.3%) participants had a lifetime diagnosis of full- or sub-threshold BN. One participant reported a lifetime history of both AN and BN and as a result, thirty (15.9%) participants were classified as having BED with a history of AN/BN.

Baseline Demographics and Clinical Characteristics

As shown in Table 1, no significant between-group differences were observed for age, gender, BMI, or race. Available data on highest adolescent BMI ($n=162$) indicated that during adolescence (mean age of 16 years) $n=3$ (1.6%) participants were underweight, $n=82$ (43.3%) were normal weight, $n=47$ (24.9%) were overweight, and $n=30$ (15.9%) were obese. There were no significant differences in highest adolescent BMI between those with AN/BN histories and those without. At baseline, $n=22$ (22.6%) of participants were overweight and $n=166$ (87.8%) were obese, with $n=1$ missing baseline BMI data. There were no significant between-group differences in age of onset of dieting to either lose weight or control weight. There were also no significant between-group differences in lifetime history of MDD; however, those with a history of AN/BN presented with significantly higher rates of current comorbid mood disorders. Those with a history of AN/BN also presented with significantly higher baseline global EDE scores and higher Shape Concern EDE subscale scores.

Treatment Completion and Success Rates

In the overall sample, 71.58% of participants completed EOT, 61.58% completed 6-month follow-up, and 47.89% completed 12-month follow-up. At EOT, 32.8% of participants were abstinent from OBEs, with 45.7% and 50% OBE abstinence rates at 6-month and 12-month follow-up, respectively.

Lifetime AN/BN History as a Predictor of Outcome in BED

At EOT, BED participants with a history of AN/BN had higher global EDE scores, higher OBE frequencies, and higher Restraint, Eating Concern, and Weight Concern EDE subscale scores (see Table 2). At 12-month follow-up, participants with a history of AN/BN had higher OBE frequencies.

Discussion

Our findings indicate that individuals with BED who have a history of AN/BN have higher global EDE scores and higher rates of mood disorders at baseline. These findings are consistent with previous studies showing that eating-related psychopathology and comorbid depression are associated with prior ED histories in AN or BN.^{3,11,17} A comparison of treatment response between BED subgroups revealed higher global EDE scores and higher Restraint, Eating Concern, and Weight Concern at EOT in those with a history of AN/BN.

The subgroup with a history of AN/BN also had more OBEs at EOT and at 12-month follow-up.

The present findings suggest that adults with BED can be differentiated by AN/BN history. Extant literature on diagnostic “crossover” may help to interpret these findings, as previous studies of AN, BN, and BED have demonstrated more severe symptomatology in those with a history of a different ED.^{3,10-13,17-18} First, the presence of higher rates of comorbid mood disorders in our BED subgroup with a history of AN/BN is consistent with ED crossover in general, as both AN to BN and BN to AN transitions are associated with depression.^{3,17} Second, crossover from AN or BN to BED involves a change in the symptoms required for diagnosis, but not necessarily a change in global ED severity. Our findings suggest that while some symptoms may improve in the transition from AN/BN to BED (e.g., decrease in compensatory behaviors), eating-related disturbances are more severe in those with a history of AN/BN and these symptoms remain elevated at EOT.

ED history appears to have predictive value in BED treatment, as our data show that those who have a history of AN/BN have greater eating-related psychopathology and higher OBE frequencies following group CBT. Interestingly, however, only higher OBE frequencies remained significant through 12-month (but not 6-month) follow-up. Despite the lack of between-group differences in OBEs at baseline, these findings suggest that more intensive strategies may be needed to target binge-eating in the treatment of the subgroup of adults with BED who have an ED history.

Several methodological limitations of this study should be noted. First, this study examined a treatment-seeking sample that may not be representative of community samples. In addition, the sample size and power limitations prevented the examination of possible differences between AN and BN histories independently, of ED history as a moderator of outcome, and of other ED histories (e.g., not otherwise specified). The nature of available data also precluded our ability to examine AN/BN or BED onset or total duration of illness, which may have been confounding variables given our examination of AN/BN histories. Future research examining these particular variables may provide useful and relevant information about the trajectory of BED. In addition, given that diagnoses were based on DSM-IV classification, replication is needed using DSM-5 criteria. Finally, the validity of our results may be limited by our approach to subgroup classification, which relied on retrospective recall and self-report.

Currently, little is known about the longitudinal progression of BED. Results from this investigation indicate that subgrouping BED by lifetime history of AN/BN may provide clinically useful information about symptom severity and response to treatment. Future research may expand upon current findings by aiming to identify the maintaining mechanisms of binge-eating in adults with BED who have a history of AN/BN, as this diagnostic trajectory may have important implications for treatment.

References

1. Allen KJ, Byrne SM, Oddy WH, Crosby RD. DSM-IV-TR and DSM-5 EDs in adolescents: Prevalence, stability, and psychosocial correlates in a population-based sample of male and female adolescents. *J Abnorm Psychol.* 2013; 122(3):720–732. [PubMed: 24016012]
2. Fichter MM, Quadflieg N. Long-term stability of ED diagnoses. *Int J Eat Disorder.* 2007; 40:561–566.
3. Castellini G, Lo Suaro C, Mannucci E, Ravaudi C, Rotella CM, Faravelli C, et al. Diagnostic crossover and outcome predictors in EDs according to DSM-IV and DSM-V proposed criteria: A 6-year follow-up study. *Psychosom Med.* 2011; 73:270–279. [PubMed: 21257978]
4. Eddy KT, Swanson SA, Crosby RD, Franko DL, Engel S, Herzog DB. How should DSM-V classify ED not otherwise specified (EDNOS) presentations in women with lifetime anorexia or bulimia nervosa? *Psychol Med.* 2010; 40:1735–1744. [PubMed: 20047706]
5. Grilo CM, White MA, Masheb RM. DSM-IV psychiatric disorder comorbidity and its correlates in binge eating disorder. *Int J Eat Disord.* 2009; 42(3):228–234. [PubMed: 18951458]
6. Agras WS, Crow S, Mitchell JE, Halmi KA, Bryson S. A 4-year prospective study of ED NOS compared with full ED syndromes. *Int J Eat Disorder.* 2009; 42(6):565–570.
7. Agüera Z, Riesco N, Jimenes-Murcia S, Islam MA, Granero R, Vicente E, et al. Cognitive behaviour therapy response and dropout rate across purging and nonpurging bulimia nervosa and binge eating disorder: DSM-5 implications. *BMC Psychiatry.* 2013; 13:285–293. [PubMed: 24200085]
8. Eddy KT, Dorer DJ, Franko DL, Tahlilani K, Thompson-Brenner H, Herzog DB. Diagnostic crossover in anorexia nervosa and bulimia nervosa: Implications for DSM-V. *Am J Psychiatry.* 2008; 165(2):245–250. [PubMed: 18198267]
9. Bulik CM, Sullivan PF, Fear J, Pickering A. Predictors of the development of bulimia nervosa in women with anorexia nervosa. *J Nerv Ment Dis.* 1997; 185(11):704–707. [PubMed: 9368548]
10. Sullivan PF, Bulik CM, Carter FA, Gendall KA, Joyce PR. The significance of a prior history of anorexia in bulimia nervosa. *Int J Eat Disorder.* 1996; 20(3):253–261.
11. White JH. Symptom development in bulimia nervosa: A comparison of women with and without a history of anorexia nervosa. *Arch Psychiatr Nursing.* 2000; 14(2):81–92.
12. Vaz FJ, Guisado JA, Penas-Lledo EM. History of anorexia nervosa in bulimic patients: Its influence on body composition. *Int J Eat Disorder.* 2003; 34:148–155.
13. Goldschmidt AB, Peterson CB, Wonderlich SA, Crosby RD, Engel SG, Mitchell JE, et al. Trait-level and momentary correlates of bulimia nervosa with a history of anorexia nervosa. *Int J Eat Disorder.* 2013; 46(2):140–146.
14. Fichter MM, Quadflieg N. Twelve-year course and outcome of bulimia nervosa. *Psychol Med.* 2004; 34:1395–1406. [PubMed: 15724871]
15. Eddy KT, Dorer DJ, Franko DL, Tahlilani K, Thompson-Brenner H, Herzog DB. Should bulimia nervosa be subtyped by history of anorexia nervosa? A longitudinal validation *Int J Eat Disorder.* 2007; 40:567–571.
16. Keel PK, Mitchell JE. Outcome in bulimia nervosa. *Am J Psychiatry.* 1997; 154(3):313–321. [PubMed: 9054777]
17. Santonastaso P, Zanetti T, De Antoni C, Tenconi A, Favaro A. Anorexia nervosa patients with a prior history of bulimia nervosa. *Compr Psychiatry.* 2006; 47:519–522. [PubMed: 17067877]
18. Tozzi F, Thornton LM, Klump KL, Fichter MM, Halmi KA, Kaplan AS, et al. Symptom fluctuation in EDs: Correlates of diagnostic crossover. *Am J Psychiatry.* 2005; 162(4):732–740. [PubMed: 15800146]
19. Herzog DB, Keller MB, Sacks NR, Yeh CJ, Lavori PW. Psychiatric comorbidity in treatment-seeking anorexics and bulimics. *J Am Acad Child Adolesc.* 1992; 31:810–818.
20. Quadflieg N, Fichter MM. The course and outcome of bulimia nervosa. *Eur Child Adolesc Psychiatr.* 2003; 12:99–109.
21. Peterson CB, Mitchell JE, Crow SJ, Crosby RD, Wonderlich SA. The efficacy of self-help group treatment and therapist-led group treatment for binge-ED. *Am J Psychiatry.* 2009; 166(12):1347–1354. [PubMed: 19884223]

22. First, MB.; Spitzer, RL.; Gibbon, M.; Williams, JBW. Structured clinical interview for DSM-IV axis I disorders, research version, patient edition (SCID-I/P). New York: Biometrics Research, New York State Psychiatric Institute; 2002.
23. Lobbestael J, Leurgans M, Arntz A. Inter-rater reliability of the structured clinical interview for DSM-IV Axis I disorders (SCID I) and Axis II disorders (SCID II). *Clin Psychol Psychoth*. 2010; 18(1):75–79.
24. Fairburn, CG.; Cooper, Z. The ED examination. In: Fairburn, CG.; Wilson, GT., editors. *Binge-eating: Nature, assessment, and treatment*. 12. New York: Guilford Press; 1993. p. 317-360.
25. Berg KC, Peterson CB, Frazier P, Crow SJ. Psychometric evaluation of the ED examination and ED examination-questionnaire: A systematic review of the literature. *Int J Eat Disord*. 2012; 45(3): 428–438. [PubMed: 21744375]

Table 1
Baseline Characteristics of BED Diagnostic Subgroups

	History of AN/BN (N = 30)	No History of AN/BN (N = 159)	
Characteristic	M (SD) n (%)	M (SD) n (%)	p
Age	44.21 (10.63)	47.16 (10.09)	ns
Gender			
Female	29 (96.67%)	141 (88.68%)	ns
Male	1 (3.33%)	18 (11.32%)	
BMI	37.31 (6.34)	39.69 (8.43)	ns
Highest Adolescent BMI	24.70 (4.32)	26.11 (6.03)	ns
Age of Onset of Dieting to Control Weight	16.63 (8.21)	18.8 (9.77)	ns
Age of Onset of Dieting to Lose Weight	16.35 (6.50)	18.41 (9.02)	ns
Race (Caucasian)	27 (90.00%)	154 (96.86%)	ns
History of AN			
Full Threshold	1 (3.33%)	0 (0%)	--
Subthreshold	3 (10.00%)	0 (0%)	
History of BN			
Full Threshold	17 (56.67%)	0 (0%)	--
Subthreshold	10 (33.33%)	0 (0%)	
History of MDD	19 (63.33%)	96 (60.38%)	ns
OBE Frequency	24.13 (13.07)	22.75 (15.44)	ns
EDE Global	3.03 (.90)	2.54 (.83)	.004 *
Restraint	1.81 (1.45)	1.54 (1.31)	ns
Eating Concern	2.41 (1.40)	1.88 (1.17)	ns
Shape Concern	4.07 (.81)	3.46 (1.02)	.002 *
Weight Concern	3.83 (1.06)	3.29 (1.12)	ns
Current Comorbidity			
Mood Disorder	8 (26.67%)	10 (6.29%)	.002 *
Anxiety Disorder	12 (40.00%)	36 (22.64%)	ns

Note: BMI, Body Mass Index; AN, Anorexia Nervosa; BN, Bulimia Nervosa; BED, Binge Eating Disorder; ED, Eating Disorder; and EDE, Eating Disorder Examination; MDD, Major Depressive Disorder.

*
p .01

Table 2

Comparison of Outcomes by BED Diagnostic Subgroup

History of AN/BN No History of AN/BN (N=30) (N=159)							
Outcome Variable	M	SE	M	SE	B	W ^a	p
EOT							
OBE Abstinence	.20	.08	.34	.04	.69	2.00	.158
OBE Frequency	7.03	1.78	3.33	.40	-.75	6.59	.010*
EDE Global	2.34	.16	1.75	.07	-.60	11.71	.001**
Restraint	1.69	.20	1.07	.09	-.62	8.47	.004*
Eating Concern	1.51	.18	.79	.08	-.71	13.09	<.001**
Shape Concern	2.97	.21	2.58	.10	-.39	2.73	.098
Weight Concern	3.22	.23	2.56	.11	-.67	6.92	.009*
6-Month Follow-Up							
OBE Abstinence	.44	.12	.48	.06	.13	.06	.800
OBE Frequency	6.80	1.72	3.47	.43	-.67	5.54	.019
EDE Global	1.74	.16	1.65	.07	-.09	.28	.599
Restraint	1.55	.22	1.09	.10	-.45	3.43	.064
Eating Concern	.75	.21	.70	.10	-.06	.06	.802
Shape Concern	2.26	.22	2.42	.10	.16	.43	.515
Weight Concern	2.40	.23	2.39	.11	-.01	.00	.964
12-Month Follow-Up							
OBE Abstinence	.25	.11	.59	.06	1.46	5.11	.024
OBE Frequency	7.00	1.94	2.18	.34	-1.17	12.60	<.001**
EDE Global	1.56	.18	1.50	.09	-.06	.09	.767
Restraint	1.34	.27	1.10	.13	-.24	.62	.431
Eating Concern	.61	.20	.62	.10	.00	.00	.992
Shape Concern	2.10	.25	2.13	.13	.03	.01	.919
Weight Concern	2.22	.26	2.18	.13	-.03	.01	.905

Notes: B, Logit Coefficient; W, Wald's χ^2 Statistic; CI, Confidence Interval; EOT, End of Treatment; EDE, Eating Disorder Examination; and OBE, Objective Binge Episodes

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