

Eating Disorders

The Journal of Treatment & Prevention

ISSN: 1064-0266 (Print) 1532-530X (Online) Journal homepage: <https://www.tandfonline.com/loi/uedi20>

Symptoms of anorexia nervosa and bulimia nervosa have differential relationships to borderline personality disorder symptoms

Alexia E. Miller, Sarah E. Racine & E. David Klonsky

To cite this article: Alexia E. Miller, Sarah E. Racine & E. David Klonsky (2019): Symptoms of anorexia nervosa and bulimia nervosa have differential relationships to borderline personality disorder symptoms, *Eating Disorders*, DOI: [10.1080/10640266.2019.1642034](https://doi.org/10.1080/10640266.2019.1642034)

To link to this article: <https://doi.org/10.1080/10640266.2019.1642034>



Published online: 15 Jul 2019.



Submit your article to this journal [↗](#)



Article views: 315



View related articles [↗](#)




View Crossmark data [↗](#)



Citing articles: 1 View citing articles [↗](#)



Symptoms of anorexia nervosa and bulimia nervosa have differential relationships to borderline personality disorder symptoms

Alexia E. Miller ^{a,b}, Sarah E. Racine^a, and E. David Klonsky^b

^aDepartment of Psychology, McGill University, Montreal, QC, Canada; ^bDepartment of Psychology, University of British Columbia, Vancouver, Canada

ABSTRACT

Eating disorders (EDs) and borderline personality disorder (BPD) are highly comorbid. BPD is characterized by the presence of at least five of nine symptoms. Given the number/variety of emotional and interpersonal symptoms that comprise BPD, some BPD traits may relate to EDs, whereas others may not be associated. This study examined relationships between BPD symptoms and symptoms of bulimia nervosa (BN) and anorexia nervosa (AN), including whether the nine BPD symptoms differentially relate to BN versus AN. Participants were 208 adolescent psychiatric inpatients. BPD symptoms, measured via structured interview, correlated more strongly with self-reported BN than AN symptoms. BN and AN symptoms were greater among individuals who endorsed unstable relationships, affective instability, emptiness, identity disturbance, inappropriate anger, dissociation/paranoia, and suicidal behavior. BN, but not AN symptoms, were higher when impulsivity was endorsed. Avoiding abandonment was neither related to BN nor AN. Affective instability, impulsivity, and anger had substantially larger associations with BN compared to AN, while identity disturbance was more strongly related to AN than BN. Findings provide useful information for targeting specific BPD symptoms to help prevent and reduce co-occurring EDs and BPD and the negative consequences associated with this comorbidity.

Clinical Implications

- Bulimia nervosa and anorexia nervosa symptoms were significantly correlated with borderline personality disorder symptomatology.
- Bulimia nervosa and anorexia nervosa symptoms were greater among individuals who endorsed most borderline personality disorder traits.
- Specific borderline personality disorder traits differentially related to bulimia nervosa vs. anorexia nervosa.
- Findings are useful for the conceptualization and treatment of eating disorders-borderline personality disorder comorbidity.

- Treatment should target specific borderline personality disorder symptoms in patients with both an eating disorder and borderline personality disorder.

Introduction

Eating disorders (EDs) and borderline personality disorder (BPD) have high rates of comorbidity (Sansone, Levitt, & Sansone, 2004). In a meta-analysis of 47 studies examining the prevalence of personality disorders among individuals with EDs, BPD was the most prevalent personality disorder among individuals with bulimia nervosa (BN; 28% had BPD) and anorexia nervosa (AN) binge eating-purging subtype (25% had BPD; Sansone et al., 2004). Similarly, ED comorbidity is common among patients with BPD. Prevalence estimates for EDs range from 17.8% in treatment-seeking women with BPD enrolled in dialectical behavior therapy (DBT) trial to 53% in an inpatient BPD sample (Chen, Brown, Harned, & Linehan, 2009; Zanarini et al., 1998). Importantly, having both an ED and BPD is associated with higher levels of distress, psychological disturbance, and non-suicidal and suicidal behavior than having only one disorder (Ben-Porath, Wisniewski, & Warren, 2009; Chen et al., 2009; Steiger & Stotland, 1996). These psychopathological characteristics create a more complicated clinical picture and challenges within treatment, including more frequent re-hospitalizations (Ben-Porath et al., 2009; Chen et al., 2009; Zeeck et al., 2007). The heightened risk associated with ED and BPD comorbidity makes this a critical clinical subgroup to target in interventions, and basic research on co-occurring symptoms may inform treatment options.

Research examining ED-BPD comorbidity has generally focused on BN rather than AN. Indeed, the core features of BN (i.e., binge eating and purging) are impulsive in nature, with binge eating being one of the several forms of impulsivity considered in the BPD diagnosis (American Psychiatric Association, 2013). Further, emotion dysregulation has been identified as an important mechanism in many theoretical frameworks of BN and BPD (Linehan, 1993; Racine & Horvath, 2018). While research has generally found higher rates of BPD in individuals with BN than AN restrictive subtype (Farstad, McGeown, & Von Ranson, 2016), ED diagnoses evidence a fair amount of crossover and flux over time (Eddy et al., 2008). Therefore, the relationship between BPD with AN and its component symptoms is also worthy of study. One study examining rates of EDs in patients with BPD found similar rates of AN (21.7%) and BN (24.1%) comorbidity (Zanarini, Reichman, Frankenburg, Reich, & Fitzmaurice, 2010). Further, in samples of psychiatric inpatients and internal medicine outpatients, correlations between BPD symptoms and the endorsement of binge eating and restrictive eating were similar in magnitude (Sansone, Chu, Wiederman, & Lam, 2011). Finally, although few studies have examined outcomes of patients with AN with comorbid BPD (see Zanarini et al., 2010 for a study on the course of AN in inpatients with BPD), one study found that patients with AN with an “undercontrolled” personality profile (i.e., indexed by the BPD

symptoms of impulsivity, emotion regulation difficulties, and self-harm) had poorer outcome at discharge and higher rates of readmission to treatment (Wildes et al., 2011). Knowing whether BN and AN are differentially associated with BPD is important for the conceptualization and treatment of ED and BPD comorbidity.

Notably, BPD is a multidimensional disorder characterized by the presence of at least five of nine distinct symptoms: unstable interpersonal relationships, avoidance of abandonment, affective instability, emptiness, identity disturbance, inappropriate anger, dissociation/paranoia, suicidal behavior, and impulsive behavior. Due to the number and variety of BPD symptoms, it may be that some BPD symptoms play a role in EDs, whereas others do not. Individual BPD symptoms such as impulsivity, anger, and suicidal behavior have been frequently studied in the context of EDs (e.g., Amianto et al., 2012; Claes et al., 2015; Fischer, Smith, & Anderson, 2003; Miotto, Pollini, Restaneo, Favaretto, & Preti, 2008). For example, Claes et al. (2015) demonstrated that individuals with EDs had higher levels of non-suicidal self-injury and impulsivity than healthy controls, with patients with BN scoring higher than those with AN. Another study reported significantly higher levels of anger in patients with BN than patients with AN and healthy controls (Miotto et al., 2008). Despite research indicating that some BPD traits are more strongly related to BN than AN, several BPD symptoms remain unstudied or understudied in relation to EDs. For example, abandonment avoidance and emptiness have been studied very little in the context of EDs. It may be that only certain BPD symptoms account for the high levels of comorbidity between EDs and BPD. To our knowledge, no single study on EDs has explored associations with each of the nine BPD symptoms. Knowing which specific BPD symptoms play a role in BN and AN, as well as the differences between BN and AN, would allow clinicians to better understand the unique challenges of a comorbid BPD diagnosis for each ED and focus interventions on targeting specific BPD symptoms.

Additionally, adolescence is a critical time point for the development of both EDs and BPD. It is well-known that EDs and their component symptoms often emerge and peak during adolescence (American Psychiatric Association, 2013). Similarly, a meta-analysis by Miller, Muehlenkamp, and Jacobson (2008) examining the prevalence, reliability, and validity of BPD in adolescence argued that this developmental timepoint is important for future BPD research. Thus, studying the relationship between ED and BPD symptoms in an adolescent sample may be particularly relevant for understanding the nature of the ED-BPD relationship.

To further clarify the relation between ED and BPD symptomatology, we examined two questions in a sample of adolescent psychiatric inpatient who were interviewed about their BPD symptoms and reported on their BN and AN symptoms: 1) whether a composite measure of BPD symptoms differentially relates to symptoms of BN versus AN; 2) whether the nine specific symptoms of BPD differentially relate to BN and AN.

Methods

Participants

Participants were 208 adolescent patients from a psychiatric inpatient or partial hospitalization unit of a hospital in the northeastern United States. Participants were admitted for short-term treatment for a range of severe psychopathology (i.e., mood disorders, anxiety disorders, substance-related disorders, and suicidality). Inpatient stays were typically one week or less, and partial hospitalization treatment typically lasted for one to two weeks. Most patients transitioned from inpatient to partial hospitalization treatment. The participants were recruited for a larger study on non-suicidal self-injury and related constructs over a period of two years (June 2008 to October 2010; Glenn & Klonsky, 2013a). Of these 208 adolescents, 181 completed the structured interview assessing BPD criteria, 135 completed the questions on BN symptoms, and 157 completed questions on AN symptoms. Participants ranged in age from 12 to 18 years ($M = 15.13$; $SD = 1.64$) and were mostly female (76.3%). Most participants identified as Caucasian (63%), with 10.6% identifying as African American, and 25% identifying as another race. Participant's body mass index (BMI) ranged from 16.44 to 48.09 ($M = 24.51$; $SD = 6.00$). The research was approved by the Institutional Review Board, and informed consent/assent was provided by the parent and adolescent.

Measures

Revised Patient Health Questionnaire for Adolescents (PHQ-A; Johnson, Harris, Spitzer, Janet, & Williams, 2002). The PHQ-A is a questionnaire that assesses endorsement of *DSM-IV-TR* criteria for eating, anxiety, mood, and substance use disorders among adolescents, and can be used to assign provisional diagnoses (Johnson et al., 2002). Several studies have used the PHQ or PHQ-A to assess ED symptoms and diagnoses (e.g., Courtney, Gamboz, & Johnson, 2008; Gruzca, Przybeck, & Cloninger, 2007; Streigel-Moore et al., 2009). BN symptoms assessed include: weight and shape very strongly affect self-evaluation; eating an unusually large amount of food within a 2-h period; loss of control when eating; presence of the following compensatory behaviors performed to lose weight or avoid gaining weight: excessive exercise, diet drugs, fasting, laxatives, vomiting, enemas; binge eating and compensatory behaviors occur twice a week for past 3 months; and problems with eating habits or weight cause impairment (see Table 1). AN symptoms assessed include: body mass index under 18; intense feeling of being overweight or fat; intense fear and concern over weight gain; weight and shape very strongly affect self-evaluation; and presence of amenorrhea (see Table 1).

Table 1. Endorsement of Bulimia Nervosa and Anorexia Nervosa Symptoms on the Patient Health questionnaire for Adolescents.

PHQ BN Symptoms	Endorsement (n (%))	PHQ AN Symptoms	Endorsement (n (%))
(1) Weight and shape very strongly affect self-evaluation	90 (43.3%)	(1) BMI under 18	7 (3.4%)
(2) Eating an unusually large amount of food within a 2-h period	53 (25.5%)	(2) Intense feeling of being overweight or fat	87 (41.8%)
(3) Loss of control over eating	62 (29.8%)	(3) Intense fear and concern over weight gain	89 (42.8%)
(4) Binge eating occurs twice a week for past 3 months	52 (25%)	(4) Weight and shape strongly affect self-evaluation	90 (43.3%)
(5) Excessive exercise	50 (24%)	(5) Presence of amenorrhea	21 (10.1%)
(6) Diet Drugs	16 (7.7%)		
(7) Fasting	35 (16.8%)		
(8) Laxatives	7 (3.4%)		
(9) Vomiting	29 (13.9%)		
(10) Enemas	21 (10.1%)		
(11) Compensatory behaviors occur twice a week for past 3 months	21 (10.1%)		
(12) Problems with eating habits or weight cause impairment	31 (14.9%)		

BN- Bulimia Nervosa, AN- Anorexia Nervosa, PHQ-A- Patient Health Questionnaire for Adolescents, BMI- Body Mass Index.

The PHQ-A has been compared to well-established diagnostic interviews and scales to assess validity (Johnson et al., 2002). Both the specificity (92%) and overall accuracy (89%) for diagnosing a psychiatric disorder using the PHQ-A were acceptable. For BN, specificity was 67% and overall accuracy was 99% (Johnson et al., 2002). Given that EDs (i.e., BN and AN) are often conceptualized and measured dimensionally (e.g., Courtney et al., 2008; Micali, Ploubidis, De Stavola, Simonoff, & Treasure, 2013), we examined symptom counts based on endorsement (yes/no) of each BN and AN symptoms, rather than BN and AN diagnoses. In the current sample, internal consistency for the BN symptom count was excellent ($\alpha = .98$). Internal consistency for the AN symptom count was lower ($\alpha = .63$), likely owing to the lower number of items for AN.

Structured Interview for DSM-IV Personality (SIDP-IV; Pfohl, Blum, & Zimmerman, 1997). The SIDP-IV is a semi-structured interview for DSM-IV personality disorders and was used to assess BPD symptoms. BPD criteria were considered present if the participant received a score of 2 (criterion has been present for most of the last 5 years) or 3 (criterion is associated with subjective distress or some impairment in social or occupational functioning or intimate relationships). The SIDP-IV was administered by graduate-level students who had been trained to reliability (i.e., $rs \geq .90$ with interviewers; Glenn & Klonsky, 2013a). The SIDP-IV has demonstrated strong reliability and validity in both clinical and community samples (Jane, Pagan, Turkheimer, Fiedler, & Oltmanns, 2006;

Pilkonis et al., 1995). Internal consistency for the total BPD symptom count was adequate ($\alpha = .77$).

Data analysis

First, Pearson correlations were calculated to examine relationships between the total BPD symptom count with BN and AN symptoms, and a Steiger's *Z*-test compared the magnitude of the two correlations. Second, in order to examine which BPD symptoms were most strongly related to ED symptoms, independent *t*-tests were conducted to statistically compare ED symptom counts in patients with and without each BPD symptom; Cohen's *d*s are presented to index effect sizes. Given that effect sizes allow for the comparison of effects within a single study (Fritz, Morris, & Richler, 2012), we compared effect sizes from *t*-test analyses to understand whether certain BPD symptoms appeared to be more strongly related to BN versus AN. We considered differences in effect sizes of at least 30 (which corresponds to the difference between a small and medium [i.e., 0.2 and 0.5, respectively], and a medium and large [i.e., 0.5 and 0.8, respectively], Cohen's *d*) to be meaningful.

Results

Table 1 presents the endorsement of BN and AN symptoms on the PHQ-A. Endorsement of ED symptoms was quite high for both BN and AN symptoms. BN items "binge eating" and "loss of control when eating" were each endorsed by over 25% of the sample, while engaging in any of the compensatory behaviors was endorsed by 31.7%. AN cognitive symptoms "intense feeling of being overweight or fat", "intense fear and concern over weight gain", and "weight and shape very strongly affect self-evaluation" were all endorsed by over 40% of the sample.

Descriptive statistics and correlations are presented in Table 2. The mean number of BN symptoms endorsed was 3.02 ($SD = 2.61$, Range = 0–12), and the mean number of AN symptoms endorsed was 1.77 ($SD = 1.22$; Range = 0–4). Sixteen participants (7.7%) met full diagnostic criteria for BN, whereas no participant endorsed all diagnostic symptoms of AN. The mean number of

Table 2. Descriptive statistics and correlations for total Borderline Personality Disorder symptom count, Bulimia Nervosa symptoms, and Anorexia Nervosa symptoms.

Variable	Mean (<i>SD</i>)	Range	Total BPD Symptom Count	BN	
				Symptoms	AN Symptoms
Total BPD Symptom Count	3.56 (2.43)	0–9	–	–	–
BN Symptoms	3.02 (2.61)	0–12	.60***	–	–
AN Symptoms	1.77 (1.22)	0–4	.47***	.66***	–

BPD- Borderline Personality Disorder, BN- Bulimia Nervosa, AN- Anorexia Nervosa.

*** $p < .001$.

BPD symptoms was 3.56 ($SD = 2.53$; Range = 0–9); 60 participants (33%) met full criteria for a BPD diagnosis (i.e., endorsed at least five out of nine BPD symptoms). Of these 60 participants, nine (15%) also met full criteria for BN. In terms of correlations, the total BPD symptom count was significantly correlated with both BN symptoms ($r = .60$) and AN symptoms ($r = .47$). The magnitude of the BPD-BN correlation was statistically larger than the magnitude of the BPD-AN correlation (Steiger's $Z = 2.09$, $p = .037$).

Finally, [Table 3](#) presents the mean BN and AN symptom counts for participants who did versus did not endorse each BPD symptom. A significantly greater number of total symptoms for both BN and AN were found among individuals who endorsed each of the following BPD symptoms: unstable interpersonal relationships, affective instability, emptiness, identity disturbance, inappropriate anger, disassociation/paranoia, and suicidal behavior. Associations between these BPD symptoms with both BN and AN symptoms were medium-to-large in magnitude (i.e., $ds = 0.44$ – 1.20). There was a significantly greater number of BN symptoms, but not AN symptoms, reported among individuals who endorsed impulsive behavior. There was no significant difference in BN or AN symptoms for participants who did versus did not endorse abandonment avoidance. Of the BPD symptoms, effect sizes were largest ($ds > 1.0$) for endorsement of suicidal behavior with BN symptoms and endorsement of identity disturbance with AN symptoms. The difference in effect sizes from the t -test analyses examining BN and AN symptom counts for those with versus without each BPD trait are presented in the final column of [Table 3](#). The effect sizes for the association between affective instability, inappropriate anger, and impulsive behavior were considered larger for BN than AN, while the effect size for identity disturbance was considered larger for AN than BN.

Discussion

Previous research has established that EDs and BPD are highly comorbid and that this comorbidity is associated with heightened levels of distress, psychological disturbance, and suicidal behavior (Ben-Porath et al., 2009; Chen et al., 2009; Steiger & Stotland, 1996). However, BPD is a multidimensional disorder, and it is unknown which of the nine BPD symptoms relate most strongly to symptoms of BN and AN. In order to better understand the nature of ED-BPD comorbidity, this study had two aims. The first aim was to examine the relationship between BPD symptoms and symptoms of BN and AN. Both BN and AN symptoms were significantly correlated with BPD symptomatology, though BN symptoms were more strongly associated with BPD symptoms than AN symptoms. This pattern is consistent with the stronger relationship between BN and BPD than AN and BPD found in previous research (Godt, 2008; Reas, Rø, Karterud, Hummelen, & Pedersen,

Table 3. Means, Independent-T-Tests, and Cohen's *d* comparing symptom counts for Bulimia Nervosa and Anorexia Nervosa based on Borderline Personality Disorder symptom endorsement.

BPD Symptom	BN Symptoms				AN Symptoms				
	Mean: No (<i>n</i>)	Mean: Yes (<i>n</i>)	<i>t</i> (<i>df</i>)	Cohen's <i>d</i>	Mean: No (<i>n</i>)	Mean: Yes (<i>n</i>)	<i>t</i> (<i>df</i>)	Cohen's <i>d</i>	Effect size difference
Unstable Interpersonal Relationships	2.78 (96)	5.00 (22)	3.90 (116)	0.72	1.73 (109)	2.41 (27)	2.66 (134)	0.46	0.26
Avoid Abandonment	3.07 (101)	3.94 (17)	1.31 (116)	0.24	1.21 (117)	1.10 (19)	1.55 (134)	0.28	-0.04
Affective Instability	2.17 (64)	4.41 (54)	5.26 (116)	0.98	1.59 (76)	2.22 (60)	3.10 (134)	0.54	0.44
Emptiness	2.32 (65)	4.36 (53)	4.43 (116)	0.82	1.48 (81)	2.44 (55)	5.22 (134)	0.90	-0.08
Identity Disturbance	2.61 (85)	4.70 (33)	4.27 (116)	0.82	1.60 (102)	2.68 (34)	6.59 (134)	1.14	-0.32
Inappropriate Anger	1.76 (33)	3.80 (84)	4.17 (115)	0.78	1.47 (38)	2.04 (97)	2.53 (133)	0.44	0.34
Dissociation/Paranoia	2.70 (80)	4.35 (37)	2.96 (115)	0.55	1.65 (94)	2.41 (41)	3.56 (133)	0.62	-0.07
Suicidal Behavior	1.70 (44)	4.14 (73)	6.38 (115)	1.20	1.29 (59)	2.34 (76)	5.62 (133)	0.97	0.23
Impulsive Behavior	2.30 (60)	4.19 (57)	4.28 (115)	0.80	1.75 (67)	2.01 (68)	1.31 (133)	0.23	0.57

BPD- Borderline Personality Disorder, BN- Bulimia Nervosa, AN- Anorexia Nervosa. Column labeled "Effect size difference" presents the difference in the effect size from the t-tests analysis for BN symptoms minus AN symptoms. Positive values represent larger effect sizes for BN symptoms, and negative effect sizes represent larger effect sizes for AN symptoms. Effect size differences of at least .30 were considered meaningful.

2013). While the BPD symptom count more strongly correlated with BN symptoms than AN symptoms, BPD was still highly associated with AN symptoms, consistent with the relationship between BPD and the core AN symptom of dietary restriction previously reported by Sansone et al. (2011). Overall, findings suggest that clinicians should be aware that the presence of ED symptoms may be likely in patients with BPD, and the presence of BPD symptoms may be likely in patients with EDs, which may have implications for case conceptualization and treatment.

The second aim of this study was to investigate relationships between each of the specific BPD symptoms with BN and AN symptoms. Most BPD symptoms were associated with greater endorsement of BN and AN symptoms. Specifically, higher levels of BN and AN symptoms were reported among those with emotional (i.e., affective instability, emptiness, inappropriate anger), behavioral (i.e., suicidal behavior), and interpersonal (i.e., unstable interpersonal relationships) symptoms of BPD. Interestingly, the BPD symptom of impulsivity was associated only with BN symptoms, but not AN symptoms. This finding is consistent with the fact that binge eating is one of the several forms of impulsivity considered in the BPD diagnosis in the *DSM-5*. Moreover, past studies have found greater levels of impulsivity in individuals with BN compared to AN (Claes, Vandereycken, & Vertommen, 2005; Fahy & Eisler, 1993). Finally, neither AN nor BN symptoms were related to the endorsement of abandonment avoidance. Findings suggest that some BPD symptoms, more than others, account for the observed comorbidity between BPD and EDs. Knowing which specific BPD symptoms are more strongly associated with ED symptoms can help clinicians identify more targeted interventions for individuals presenting with ED-BPD comorbidity.

A further goal of this study was to understand whether certain BPD symptoms might be more strongly related to BN versus AN. Effect sizes for the association between avoidance of abandonment, emptiness, dissociation/paranoia, and suicidal behavior with BN and AN were similar in magnitude, suggesting that these BPD symptoms are equally related to BN and AN symptoms. In contrast, affective instability, inappropriate anger, and impulsivity had stronger relationships with BN than AN symptoms. These results are consistent with past research that found greater levels of anger and impulsivity in patients with BN versus AN (Claes et al., 2005; Miotto et al., 2008). To our knowledge, no past research has examined affective instability in BN vs. AN; however, consistent with our findings, a recent study demonstrated elevated levels of affective instability in participants with BN. Using ecological momentary assessment data, Santangelo et al. (2017) found that individuals with BN demonstrated higher levels of affective instability than healthy controls, and had similar levels as those with BPD. Interestingly, many of the theories of the mechanisms underlying these specific BPD traits and the symptoms of BN are similar. For example, in Linehan's theory of

BPD (1993), individuals with BPD have poor emotion regulation and may turn to many of the other BPD symptoms (i.e., impulsive behaviors and anger outbursts) to cope with their emotional distress. Similarly, many theoretical models of BN involve the notion that negative mood is a precursor to binge eating and that individuals with BN will impulsively use binge eating to reduce their distress or avoid their emotional states (Haedt-Matt & Keel, 2011). In light of these theories and the current findings, it may be that poor emotion regulation plays a key role in the relationship between these BPD traits (i.e., affective instability, inappropriate anger, and impulsivity) and BN symptoms.

In contrast, identity disturbance had a stronger relationship to AN than BN symptoms. This finding is consistent with Schmidt and Treasure's (2006) interpersonal-maintenance model of AN. This model suggests that both perfectionism and pro-anorexic beliefs serve as maintenance factors for AN (Schmidt & Treasure, 2006). The model explains that the rigid and perfectionistic tendencies found in individuals with AN facilitate pro-anorexic beliefs, and the continued success of dieting leaves these individuals with a sense of mastery and control. This sense of pride causes individuals with AN to be less likely to seek treatment or accept help. Over time, AN psychopathology often becomes more and more valued by the individual and can become central to their sense of identity, leaving them with little sense of self outside of the ED (Higbed & Fox, 2010). On the contrary, individuals with BN or BED are more likely to seek help as they often report feeling ashamed of their binge eating and purging behaviors and unsuccessful weight loss attempts (Serpell & Treasure, 2002). The behavior of binge eating is not in line with their goal to lose weight, and thus individuals with BN are unlikely to experience their disorder in the same ego-syntonic way as individuals with AN.

Overall, understanding differential relations between symptoms of BPD, BN, and AN can lead to more targeted treatments that aim to reduce the risks associated with co-occurring ED and BPD symptoms. Specifically, although DBT has shown promise in treating co-occurring EDs and BPD (Bankoff, Karpel, Forbes, & Pantalone, 2012; Navarro-Haro et al., 2018), DBT is not considered a first-line treatment for EDs (APA Presidential Task Force on Evidence-Based Practice, 2006). Specific DBT skills can be used to target the individual BPD symptoms most relevant to maintaining the ED-BPD relationship. For example, DBT is highly effective for treating emotion dysregulation and impulsive behaviors (Neacsiu, Eberle, Kramer, Wiesmann, & Linehan, 2014). Our findings suggest that both affective instability and impulsivity were more associated with BN than AN and thus, DBT may be a good option to target these specific symptoms in individuals with BN.

To our knowledge, this study is the first to examine the differential overlap of individual BPD symptoms with BN and AN symptoms. Strengths of this study include examination of a large clinical sample of adolescents hospitalized for severe

psychopathology and a corresponding high rate of BPD symptom endorsement. Limitations of the study include its correlational nature; as such, we cannot determine the direction of causality regarding relationships between BPD and ED symptoms. Another limitation is that, unlike BPD symptoms, ED symptoms were assessed using a self-report measure examining *DSM-IV* criteria for an ED. Due to the nature of the PHQ-A, and the fact that several items deal with frequency and impairment, the assessment of symptoms of EDs is somewhat limited, and thus is not ideal for examining individual ED symptoms. Future research examining the relationship between BPD and EDs would benefit from using more multi-dimensional and current measures of ED symptoms to examine the association between all ED symptoms and BPD symptoms. In particular, network analyses examining specific ED symptom-BPD symptom relationships may provide an excellent way to further understand how specific ED-BPD symptoms interact with each other on the symptom level. Furthermore, few participants met full diagnostic criteria for an ED; thus, even though meaningful variation was observed in the number of ED symptoms endorsed among participants, with many of the symptoms endorsed by over 40% of the sample, future research is needed to determine if findings generalize to populations meeting full diagnostic criteria for EDs. Lastly, we examined an adolescent psychiatric population. As discussed in the introduction, this is a critical time point for the development of both ED and BPD symptoms, and there is evidence that the SIDP is a valid and reliable instrument for assessing BPD symptoms in adolescence (Glenn & Klonsky, 2013b). Nonetheless, future studies must examine whether the current findings generalize to adult populations.

In closing, this research provides important information on which of the nine BPD traits relate most strongly to EDs, and specifically to BN versus AN. The relationship between specific BPD symptoms and BN versus AN should be considered when conceptualizing ED-BPD comorbidity and treating both EDs and BPD. The field must continue to study this relationship in order to better understand how to prevent and reduce co-occurring EDs and BPD and the negative consequences associated with this comorbidity.

Author Statement

The authors have no conflict of interest to declare.

Funding

This work was supported by the Foundation for the National Institutes of Health [MH08009601].

ORCID

Alexia E. Miller  <http://orcid.org/0000-0002-6014-0780>

References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- Amianto, F., Siccardi, S., Abbate-Daga, G., Marech, L., Barosio, M., & Fassino, S. (2012). Does anger mediate between personality and eating symptoms in bulimia nervosa? *Psychiatry Research*, *200*, 502–513. doi:10.1016/j.psychres.2012.07.036
- APA Presidential Task Force on Evidence-Based Practice. (2006). Evidence-based practice in psychology. *American Psychologist*, *61*, 271–285. doi:10.1037/0003-066X.61.4.271
- Bankoff, S. M., Karpel, M. G., Forbes, H. E., & Pantalone, D. W. (2012). A systematic review of dialectal behavior therapy for the treatment of eating disorders. *Eating Disorders: the Journal of Treatment and Prevention*, *20*, 196–215. doi:10.1080/10640266.2012.668478
- Ben-Porath, D., Wisniewski, L., & Warren, M. (2009). Differential treatment response for eating disordered patients with and without a comorbid borderline personality diagnosis using a Dialectical Behavior Therapy (DBT)-informed approach. *Eating Disorders: the Journal of Treatment and Prevention*, *17*, 225–241. doi:10.1080/10640260902848576
- Chen, E., Brown, M., Harned, M., & Linehan, M. (2009). A comparison of borderline personality disorder with and without eating disorders. *Psychiatry Research*, *170*, 86–90. doi:10.1016/j.psychres.2009.03.006
- Claes, L., Islam, M., Fagundo, A., Jimenez-Murcia, S., Granero, R., & Fernandez-Aranda, F. (2015). The relationship between non-suicidal self-injury and the UPPS-P impulsivity facets in eating disorders and healthy controls. *PloS One*, *10*. doi:10.1371/journal.pone.0126083
- Claes, L., Vandereycken, W., & Vertommen, H. (2005). Impulsivity-related traits in eating disorder patients. *Personality and Individual Differences*, *39*, 739–749. doi:10.1016/j.paid.2005.02.022
- Courtney, E., Gamboz, J., & Johnson, J. (2008). Problematic eating behaviours in adolescents with low self-esteem and elevated depressive symptoms. *Eating Behaviours*, *9*, 408–414. doi:10.1016/j.eatbeh.2008.06.001
- Eddy, K. T., Dorer, D. J., Franko, D. L., Tahilani, K., Thompson-Brenner, H., & Herzog, D. B. (2008). Diagnostic crossover in anorexia nervosa and bulimia nervosa: Implications for DSM-V. *American Journal of Psychiatry*, *165*, 245–250.
- Fahy, T., & Eisler, I. (1993). Impulsivity and eating disorders. *British Journal of Psychiatry*, *162*, 193–197.
- Farstad, S. M., McGeown, L. M., & Von Ranson, M. (2016). Eating disorders and personality, 2004–2016: A systematic review and meta-analysis. *Clinical Psychology Review*, *46*, 91–105. doi:10.1016/j.cpr.2016.04.005
- Fischer, S., Smith, G., & Anderson, K. (2003). Clarifying the role of impulsivity in bulimia nervosa. *International Journal of Eating Disorders*, *33*, 406–411. doi:10.1002/eat.10165
- Fritz, C. O., Morris, P. E., & Richler, J. J. (2012). Effect size estimates: Current use, calculations, and interpretation. *Journal of Experimental Psychology: General*, *141*, 2–18. doi:10.1037/a0024338
- Glenn, C., & Klonsky, D. (2013a). Nonsuicidal self-injury disorder: An empirical investigation in adolescent psychiatric patients. *Journal of Clinical Child & Adolescent Psychology*, *42*, 496–507. doi:10.1080/15374416.2013.794699
- Glenn, C., & Klonsky, D. (2013b). Reliability and validity of borderline personality disorder in hospitalized adolescents. *Journal of Canadian Academy of Child and Adolescent Psychiatry*, *22*, 206–211.
- Godt, K. (2008). Personality disorders in 545 patients with eating disorders. *European Eating Disorders Review*, *16*, 94–99. doi:10.1002/erv.844

- Gruzca, R., Przybeck, T., & Cloninger, R. (2007). Prevalence and correlates of binge eating disorder in a community sample. *Comprehensive Psychiatry*, *48*, 124–131. doi:10.1016/j.comppsy.2006.08.002
- Haedt-Matt, A., & Keel, P. K. (2011). Revisiting the affect regulation model of binge eating: A meta-analysis of studies using ecological momentary assessment. *Psychological Bulletin*, *137*, 660–681. doi:10.1037/a0023660
- Higbed, L., & Fox, J. (2010). Illness perceptions in anorexia nervosa: A qualitative investigation. *The British Journal of Clinical Psychology*, *49*, 307–325. doi:10.1348/014466509X454598
- Jane, J., Pagan, J., Turkheimer, E., Fiedler, E., & Oltmanns, T. (2006). The interrater reliability for the structured interview for DSM-IV personality. *Comprehensive Psychiatry*, *47*, 368–375. doi:10.1016/j.comppsy.2006.01.009
- Johnson, J. G., Harris, E. S., Spitzer, R. L., Janet, B. W., & Williams, D. S. W. (2002). The patient health questionnaire for adolescents: Validation of an instrument for the assessment of mental disorders among adolescent primary care patients. *Journal of Adolescent Health*, *30*, 196–204. doi:10.1016/S1054-139X(01)00333-0
- Linehan, M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York, NY: Guilford Press.
- Micali, N., Ploubidis, G., De Stavola, B., Simonoff, E., & Treasure, J. (2013). Frequency and patterns of eating disorder symptoms in early adolescence. *Journal of Adolescent Health*, *5*, 574–581. doi:10.1016/j.jadohealth.2013.10.200
- Miller, A. L., Muehlenkamp, J. J., & Jacobson, C. M. (2008). Fact or fiction: Diagnosing borderline personality disorder in adolescents. *Clinical Psychology Review*, *28*, 969–981. doi:10.1016/j.cpr.2008.02.004
- Miotto, P., Pollini, B., Restaneo, A., Favaretto, G., & Preti, A. (2008). Aggressiveness, anger, and hostility in eating disorders. *Comprehensive Psychiatry*, *49*, 364–373. doi:10.1016/j.comppsy.2008.01.004
- Navarro-Haro, M. V., Botella, C., Guillen, V., Moliner, R., Marco, H., Jorquera, M., & Garcia-Palacios, A. (2018). Dialectical behavior therapy in the treatment of borderline personality disorder and eating disorders comorbidity: A pilot study in a naturalistic setting. *Cognitive Therapy and Research*, *42*, 1–14. doi:10.1007/s10608-018-9906-9
- Neacsiu, A. D., Eberle, J. W., Kramer, R., Wiesmann, T., & Linehan, M. M. (2014). Dialectical behavior therapy skills for transdiagnostic emotion dysregulation: A pilot randomized controlled trial. *Behaviour Research and Therapy*, *59*, 40–51. doi:10.1016/j.brat.2014.05.005
- Pfohl, B., Blum, N., & Zimmerman, M. (1997). *Structured interview for DSM-IV personality*. Washington, DC: American Psychiatric Press.
- Pilkonis, P., Heape, C., Proietti, J., Clark, S., McDavid, J., & Pitts, T. (1995). The reliability and validity of two structured diagnostic interviews for personality disorders. *Archives of General Psychiatry*, *52*, 1025–1033. doi:10.1001/archpsyc.1995.03950240043009
- Racine, S. E., & *Horvath, S. A. (2018). Emotion dysregulation and eating disorders. In T. P. Beauchaine & S. E. Crowell (Eds.), *The Oxford handbook of emotion dysregulation*. Oxford, UK: Oxford University Press.
- Reas, D. L., Rø, Ø., Karterud, S., Hummelen, B., & Pedersen, G. (2013). Eating disorders in a large clinical sample of men and women with personality disorders. *The International Journal of Eating Disorders*, *46*, 801–809. doi:10.1002/eat.22176
- Sansone, R. A., Chu, J. W., Wiederman, M. W., & Lam, C. (2011). Eating disorder symptoms and borderline personality symptomatology. *Eating and Weight Disorders*, *16*, 81–85. doi:10.1007/BF03325313
- Sansone, R. A., Levitt, J. L., & Sansone, L. A. (2004). The prevalence of personality disorders in those with eating disorders. *Eating Disorders: the Journal of Treatment and Prevention*, *13*, 7–21. doi:10.1080/10640260590893593

- Santangelo, P., Reinhard, I., Koudela-Hamila, S., Bohur, M., Holtmann, J., Eid, M., & Ebner-Priemer, U. (2017). The temporal interplay of self-esteem instability and affective instability in borderline personality disorder patients' everyday lives. *Journal of Abnormal Psychology, 126*, 1057–1065. doi:10.1037/abn0000288
- Schmidt, U., & Treasure, J. (2006). Anorexia nervosa: Valued and visible. A cognitive-interpersonal maintenance model and its implications for research and practice. *British Journal of Clinical Psychology, 45*, 343–366.
- Serpell, L., & Treasure, J. (2002). Bulimia nervosa: Friend or foe? The pros and cons of bulimia nervosa. *International Journal of Eating Disorders, 32*, 164–170. doi:10.1002/eat.10076
- Steiger, H., & Stotland, S. (1996). Prospective study of outcome in bulimics as a function of Axis-II comorbidity: Long-term responses on eating and psychiatric symptoms. *International Journal of Eating Disorders, 20*, 149–161. doi:10.1002/(SICI)1098-108X(199609)20:2<149::AID-EAT5>3.0.CO;2-G
- Streigel-Moore, R. H., Roselli, F., Perrin, N., DeBar, L., Wilson, G. T., May, A., & Kraemer, H. C. (2009). Gender difference in the prevalence of eating disorder symptoms. *International Journal of Eating Disorders, 42*, 471–474. doi:10.1002/eat.20625
- Wildes, J., Marcus, M., Crosby, R., Ringham, R., Dapelo, M., Gaskill, J., & Forbush, K. (2011). The clinical utility of personality subtypes in patients with anorexia nervosa. *Journal of Consulting and Clinical Psychology, 79*, 665–674. doi:10.1037/a0024597
- Zanarini, M., Frankenburg, F., Dubo, E., Sicket, A., Trikha, A., Levin, A., & Reynolds, V. (1998). Axis I comorbidity of borderline personality disorder. *American Journal of Psychiatry, 155*, 1733–1739. doi:10.1176/ajp.155.12.1733
- Zanarini, M., Reichman, C., Frankenburg, F., Reich, D. B., & Fitzmaurice, G. (2010). The course of eating disorder in patients with borderline personality disorder: A 10-year follow-up study. *International Journal of Eating Disorders, 43*, 226–232. doi:10.1002/eat.20689
- Zeeck, A., Birindelli, E., Sandholz, A., Joos, A., Herzog, T., & Hartmann, A. (2007). Symptom severity and treatment course of bulimic patients with and without borderline personality disorder. *European Eating Disorder Review, 15*, 430–438. doi:10.1002/erv.824