



Differences in Severity of Eating Disorder Symptoms between Adults with Depression and Adults with Anxiety

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Abstract

Objectives: Anxiety and depression are both considered maintaining factors for eating disorders (ED) but it is still unclear if one is more strongly associated with ED symptoms than the other. We examined differences in severity of ED symptoms among adults with either, both, or neither depression and anxiety.

Methods: Volunteers (N=3,780) to the project implicit mental health website (<https://implicit.harvard.edu/>) self-reported their ED status (current ED: n=374, past ED: n=436; no ED: n = 2,970), their current depression/anxiety status, and their ED symptoms (using the Eating Attitudes Test). ANOVA with post-hoc comparisons were used to examine relationships between ED symptoms and comorbid depression/anxiety status among currently ill, recovered, and never ill individuals.

Results: Participants without comorbidities had the least and participants with both comorbidities had the most severe ED symptoms ($p=.021$). Participants with anxiety alone had more severe ED symptoms relative to those with depression alone across groups (current ED: $p=.024$; past ED: $p=.019$; no EDs: $p=.021$).

Discussion: These findings demonstrate, in contrast with an earlier study among youth with EDs (Hughes et al, 2013), that comorbid anxiety may be linked with more severe ED symptoms relative to comorbid depression. It is possible that anxiety serves as a maintaining factor for ED symptoms such that dieting and other ED-related behaviors may function to modulate symptoms of anxiety.

Keywords

Eating Disorders; Depression; Anxiety; Comorbidity

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INTRODUCTION

Eating disorders (EDs) are complex psychiatric conditions that are often chronic and disabling (Hoek, 2016; Udo & Grilo, 2019). Clinical and community studies report that the majority of individuals with EDs suffer from at least one psychiatric comorbidity (Ulfvebrand et al., 2015) that may precede the onset of the ED, occur concurrently with the ED, and/or persist after recovery from the ED (CYNTHIA M Bulik, 2002). Rates of specific comorbid psychiatric conditions vary significantly across studies (Blinder et al., 2006; Swanson et al., 2011), but evidence suggests that mood and anxiety disorders are the most common psychiatric comorbidities among patients with EDs (Hughes et al., 2013), with up to two-thirds of female inpatients diagnosed with an anxiety disorder and up to 90% diagnosed with major depressive disorder (Blinder et al., 2006). Despite these high rates, research studies investigating the presentation of ED symptoms among individuals with EDs and mood disorders only versus anxiety disorders only are scarce.

It is critical to understand how ED vary according to the presence of anxiety symptoms, depression symptoms, or both for several reasons (Goel et al., 2020). First, given that comorbidity is associated with chronicity and increased likelihood of dropout from treatment (Fassino et al., 2009), identification of the links between ED symptoms and comorbidity status may inform treatment planning, for example, in order to tailor specific interventions for patients with ED and anxiety versus ED and depression. Second, there is a considerable overlap between symptoms of ED and symptoms of depression (e.g., changes in appetite, fatigue, emotional instability, guilt, and self-hatred) as well as symptoms of anxiety (e.g., stress around food, eating, and weight gain) (N T Godart et al., 2007; Nathalie T Godart et al., 2000), but it is unclear how this overlap influences ED symptomatology. Third, despite the understanding that these comorbidities are often associated with severe ED symptoms (Brand-Gothelf et al., 2014; Milos et al., 2002; Sidor et al., 2015), it is still largely unknown if comorbid depression alone is associated with more severe ED symptoms relative to comorbid anxiety alone or vice versa. Indeed, to our knowledge, only two studies to date have explored this question of comorbid depression alone vs. anxiety alone (Cynthia M Bulik et al., 1996; Hughes et al., 2013). While Bulik et al. (Cynthia M Bulik et al., 1996) suggested that among women with bulimia nervosa there were no difference in ED symptoms (e.g., food restriction, frequency of binge eating, purging behaviors) in those with only mood disorder relative to those with only anxiety disorder, Hughes et al. (Hughes et al., 2013) suggested that among youth with EDs, depression comorbidity was linked with more complex and severe ED presentation (e.g., more binge eating, purging, dietary restraint, weight/shape concerns) compared with no comorbidity and compared with anxiety comorbidity alone. However, recent studies using adequately powered samples to detect which is more strongly related to the severity of ED symptoms (depression, anxiety, or the combination of depression *and* anxiety) are largely unavailable.

It is of interest to study the relationships of depression and anxiety with ED symptoms, not only among those with a current diagnosis of EDs, but also among those who have recovered from EDs, and those without a diagnosis of an ED. Studies suggest that depression tends to develop *after* the onset of the ED (Holtkamp et al., 2005; Ivarsson et al., 2000) while anxiety

tends to develop *before* the onset of the ED (Nathalie T Godart et al., 2000). Hence, a better understanding of the relationship of depression and anxiety to ED symptoms among adults with EDs, as well as among those who have recovered from EDs, and those without a diagnosis of an ED, may inform our understanding of the development of ED and its comorbidities. Furthermore, EDs are often associated with a long recovery process (Eddy et al., 2017) and some recovered individuals continue to struggle with psychological and psychiatric difficulties, such as depression and anxiety (Bardone-Cone et al., 2010; CYNTHIA M Bulik, 2002), for many years after the recovery. Studies (Wagner et al., 2006) report that people recovered from EDs may have similar rates of mood and anxiety disorders as currently ill patients. In contrast, other studies suggest that long-term recovered individuals are quite similar to healthy controls (Bardone-Cone et al., 2010) or fall between currently ill and healthy controls (Yackobovitch-Gavan et al., 2009) in their psychological and psychiatric functioning. However, studies looking at depression alone versus anxiety alone among people who have recovered from EDs are scarce.

The current study expands upon the work of Bulik et al. (Cynthia M Bulik et al., 1996) and Hughes et al. (Hughes et al., 2013) who have examined ED symptoms among clinical samples of patients with EDs and depression alone versus anxiety alone. Our study examines ED symptoms among a non-clinical sample that includes both ill and recovered individuals, as well as people without a history of EDs. It is important to use a non-clinical sample to explore links between ED symptoms, depression, and anxiety, as it is well documented (Forrest et al., 2017; Swanson & Field, 2016) that clinical and non-clinical samples have different characteristics, and specifically different rates of comorbidities. Moreover, as a result of the Berkson's bias (Berkson, 1946), individuals with more than one diagnosis are more likely to seek clinical care, thereby artificially inflating rates of comorbidities in clinical samples.

The present study explored the following research question among a large convenience sample that included three groups of volunteers with past/present diagnosis of EDs and with no history of EDs:

What are the differences between adults with either, neither, or both comorbid depression and anxiety in terms of ED symptoms?

We hypothesized that those with comorbid depression and/or anxiety would have more ED symptoms relative to those without comorbidities. Despite the dearth of research and the inconsistent findings about specific comorbidities and ED symptoms (Cynthia M Bulik et al., 1996; Hughes et al., 2013), we hypothesized that anxiety would be related to more severe ED symptoms, since anxiety usually pre-dates the illness while depression tends to come after the illness (Nathalie T Godart et al., 2000), and since some preliminary findings imply that, relative to other affective temperaments, the anxious temperament may have the strongest impact on eating psychopathology among patients with anorexia nervosa (Marzola et al., 2020).

METHOD

Procedure.

Project Implicit Mental Health website (PIMH) (Glenn et al., 2017; Wertz et al., 2016) is a sister-site to Project Implicit website (Nosek, 2005) (<https://implicit.harvard.edu/>) and a demonstration and research public website that allows visitors to learn about their implicit biases associated with mental illness. Volunteers to the PIMH website completed the informed consent form that included information about the upcoming tasks (e.g., “this study examines attitudes, preferences, and beliefs related to mental health issues”). After consenting, participants self-selected a mental-health domain (e.g., eating, depression, anxiety, mental illness) (<https://implicit.harvard.edu/implicit/user/pih/pih/selectatest.html>) and completed, in random order, the self-report questionnaire and the Implicit Association Test (IAT) (Wertz, Steinman, Glenn, Nock, & Teachman, 2016). Participants were then given the opportunity to view their IAT score and feedback if they wished. Although the results of the IAT were not included in the current analyses, only volunteers to the eating domain who completed both the IAT and the EAT-26 were included in the analyses in order to assure participants’ commitment to the study. Volunteers were not specifically asked to select a domain that was most relevant to them, but it could potentially be that domain selection was related to personal preferences.

Participants characteristics.

Volunteers were 2,785 women (73.7%) and 956 men (25.3%) with mean age of 27.96 ($SD=11.31$) who self-selected to participate in the implicit eating attitudes study on the PIMH website between May 2016 and September 2017. Male participants were not included in the final analyses as most males were in the “never ED group”, and we did not have sufficient number of male participants in the two ED groups. Participants were residents of 72 different countries, but the majority (64.3%) reported being residents of the United States. About two-thirds (64.9%) were White, 9.1% were Asian, 12.5% were Hispanic, and 6.6% were African American. Most participants (81.2%) had acquired higher than high school education. Participants characteristics by eating disorder history are presented in Table 1.

Demographics.

Participants reported their gender, age, height, weight, race, and education among other demographic information.

Mental Health History.

Volunteers were prompted with the introductory sentence “*The next questions ask for insight into your current and past mental health challenges. Responding is entirely optional.*”

Volunteers who selected to proceed were prompted with the following question: “*Are you currently, or have you ever struggled with moderate to severe mental or emotional difficulties (e.g., alcohol or drug problems, depression, panic attacks, anxiety, eating disorder, attention deficit, etc.) that lasted a minimum of several weeks and interfered with your daily life? [yes/no].*” Volunteers who selected the “yes” response were prompted with

the following instructions: “We are interested in your current and past mental health difficulties. Please read the following list of disorders and indicate whether you are currently struggling or have struggled in the past with these types of mental illnesses. If you have never struggled with any of the disorders below, please leave this form blank and click Continue.” A list of disorders were then provided in the following order: “(1) anxiety disorders (e.g., panic disorder, specific phobia/fear, social anxiety); (2) Depressive disorders (e.g., depression); (3) Eating disorders (e.g., anorexia, bulimia, binge-eating disorder); (4) Substance-related and addictive disorders (e.g., alcoholism/alcohol abuse, drug abuse); (5) Neurocognitive disorders (e.g., dementia, delirium, Alzheimer’s, traumatic brain injury); (6) Bipolar disorders (e.g., bipolar disorder, mania); (7) Schizophrenia spectrum or other psychotic disorders (e.g., schizophrenia, psychosis); (8) Obsessive-compulsive and related disorders (e.g., obsessive-compulsive disorder, hoarding, hair-pulling, body dysmorphic disorder); (9) Trauma and stress-related disorders (e.g., post-traumatic stress disorder [PTSD]); (10) Sleep-wake disorders (e.g., insomnia); (11) Personality disorders (e.g., borderline, antisocial, avoidant); (12) Other mental disorders (e.g., dissociative disorders, conversion disorder, sexual dysfunction, impulse-control disorders). In the present study, only information about current depression, anxiety, and OCD was used, in addition to information about past/current EDs. A total of 106 participants who reported that their ED is both current and past were classified as currently ill. Participants with OCD (n=65) were included in the anxiety group. Although DSM-5 includes OCD and anxiety disorders in two different chapters, studies suggest that these two conditions are closely related to each other, and there continues to be an ongoing debate and controversy about whether they should be grouped together (Vigne et al., 2019).

Eating Attitudes Test.

The 26-item version of the Eating Attitudes Test (EAT-26; Garner & AI, 1982) measures ED symptoms. The items describe various eating-related symptoms (e.g., oral control, dieting, food preoccupation) and participants report how often they experience each symptom, on a scale of *Always*, *Usually*, *Often*, *Sometimes*, *Rarely*, and *Never*. As originally recommended (Garner & Garfinkel, 1979), the EAT-26 score was computed by summing all responses, while also computing three separate scores for three subscales: Dieting, Bulimia and Food Preoccupation, and Oral Control. Higher score on the EAT-26 and its subscales reflect more severe ED symptoms.

Statistical Analyses.—All analyses were conducted in SPSS-23. Chi² and ANOVA with LSD post-hoc comparisons were used to compare characteristics (i.e., gender, age, education, race, BMI, Eat-26 score) of participants of the following four groups: adults with current depression and no anxiety, adults with current anxiety and no depression, adults with both current depression *and* anxiety, adults with no current depression or anxiety. These four groups were compared separately among participants with current/past/no EDs.

RESULTS

Analyses indicated that there were significant group differences in EAT-26 score ($p < .001$) such that across all groups (i.e., among people with past/present/no EDs), those with anxiety

alone had higher EAT-26 score relative to those with depression alone. We will discuss these results by group category.

Volunteers with current ED.

The 374 volunteers (90.5% females) who self-identified as currently suffering from an ED had a mean age of 25.3 (9.8) years and a mean EAT-26 score of 25.8 (14.4). About one third (36.6%) of these currently ill volunteers self-reported that they don't suffer from current depression or anxiety, and the remainder reported that they suffer from depression only (10.2%), anxiety only (20.9%), or both (32.4%). As presented in Table 2 there were significant group differences in EAT-26 score ($p < .001$). LSD post-hoc comparisons suggested that those without depression or anxiety had lower ($p < .001$) EAT-26 score (21.2 ± 12.8) relative to those with both comorbidities (31.5 ± 14.3). In addition, relative to those with anxiety only (26.4 ± 14.7), those with depression only (20.0 ± 11.7) reported lower ED symptoms ($p = .024$).

Volunteers with past ED.

The 436 volunteers (90.6% females) who self-reported past EDs had a mean age of 26.3 (9.7) years and a mean EAT-26 score of 15.9 (11.5). More than half (58.7%) of these recovered volunteers self-reported that they do not suffer from current depression or anxiety, and the rest reported that they suffer from depression only (6.0%), anxiety only (17.0%), or both (18.3%). As presented in Table 2, there were significant group differences in EAT-26 score ($p = .013$). LSD post-hoc comparisons suggested that those without depression or anxiety had lower ($p = .023$) EAT-26 score (15.2 ± 11.7) relative to those with both comorbidities (18.5 ± 10.3). In addition, relative to those with anxiety only (16.8 ± 12.0), those with depression only (10.4 ± 8.1) reported lower ED symptoms ($p = .019$).

Volunteers with no ED.—The 2,970 volunteers (70.0% females) who self-reported no history of EDs had a mean age of 28.5 (11.7) years and a mean EAT-26 score of 8.5 (8.5). Majority (81.4%) of these volunteers with no ED self-reported that they don't suffer from current depression or anxiety, and the rest reported that they suffer from depression only (3.6%), anxiety only (8.5%), or both (6.5%). As presented in Table 2, there were significant group differences in EAT-26 score ($p < .001$). LSD post-hoc comparisons suggested that those without depression or anxiety had lower ($p < .001$) EAT-26 score (9.3 ± 9.5) relative to those with both comorbidities (19.1 ± 14.3). In addition, relative to those with anxiety only (14.9 ± 13.1), those with depression only (11.1 ± 9.3) reported lower ED symptoms ($p = .021$).

We also used the three subscales of the EAT-26 in order to examine relationships between specific ED symptoms and comorbidities. Table 2 demonstrates that dieting score was significantly higher among those with anxiety alone relative to depression alone, among all three groups. Bulimia score was significantly higher among those with anxiety alone relative to depression alone, only among participants with current ED. Oral-control score was significantly higher among those with anxiety alone relative to depression alone, only among participants without EDs.

DISCUSSION

The literature suggests that EDs are highly correlated with depression and anxiety (CYNTHIA M Bulik, 2002). We used a large non-clinical sample of adults with past/present/no EDs, in order to examine ED symptoms among individuals with depression only relative to anxiety only. In contrast with an earlier study among youth with EDs (Hughes et al., 2013), our study provides initial findings suggesting that comorbid anxiety alone may be linked with more severe ED symptoms relative to comorbid depression alone. Although results are based on cross-sectional data, it is possible that anxiety serves as a maintaining factor for ED symptoms such that dieting and other ED-related behaviors may function to modulate symptoms of anxiety (Lavender et al., 2013).

As expected, our data indicated that volunteers without comorbidities had the least and volunteers with both comorbidities had the most severe ED symptoms. This is not surprising given that people without comorbidities tend to be more psychologically stable and therefore are likely to experience less ED related symptoms. Alternatively, it could be that those who did not report comorbidities have a tendency to minimize symptomatology, and this may apply to both their ED symptoms and other psychiatric symptoms.

Interestingly, among all examined groups (i.e., those with past/present/no EDs), comorbid anxiety alone was linked with more severe ED symptoms relative to comorbid depression alone - a finding which contradicts previous reports. While several previous studies have suggested no differences between depression alone and anxiety alone (Cynthia M Bulik et al., 1996), a study among children and youth (Hughes et al., 2013) has suggested that depression comorbidity is linked with more severe ED symptoms relative to anxiety comorbidity, especially in regard to binge eating, purging, dietary restraint and weight/shape concerns. It is noteworthy that a study among college-aged young adults (Bodell et al., 2012) reported that comorbid anxiety, but not comorbid depression, was linked with greater psychosocial impairment for individuals with BN. But this last study did not conduct a direct comparison between participants with comorbid depression alone and anxiety alone. These discrepancies between studies may be due to different study designs. For example, although different anxiety-related conditions (e.g., panic disorders, specific phobias, social anxiety, or OCD) may have different psychological and psychosocial outcomes, different measures of anxiety (e.g., the state/trait anxiety inventory) may vary from one another in their sensitivity to these different anxiety-related conditions. In addition, we used the EAT-26 (Garner & Al, 1982) and relied on self-report diagnosis among a large sample of adults with past/present/no EDs, while Hughes et al (Hughes et al., 2013) used the EDE (Cooper & Fairburn, 1987) with a smaller sample drawn from intake assessments of children and adolescents at a specialist ED clinic. It is well documented that clinical and non-clinical samples have different characteristics, and specifically different levels of comorbidities, as people who are more distressed and present with more comorbidities are more likely to seek treatment (Forrest et al., 2017; Swanson & Field, 2016).

Importantly, our results indicated that in terms of severity of ED symptoms, people with depression alone were quite similar to those without comorbidities, while people with anxiety alone were quite similar to those with both comorbidities (i.e., depression and

anxiety). These findings, which imply that anxiety can be linked with more ED symptoms relative depression, contradict several previous studies (Hughes et al., 2013). Nevertheless, this finding may not be surprising, given that anxiety is known to be linked with the core psychopathology of EDs (Lavender et al., 2013; Spindler & Milos, 2007). People with EDs, and specifically those with anorexia nervosa, tend to be pervasively anxious and preoccupied about issues related to shape, weight, and food, such that any slight increase in body weight or any augmentation in meal plan results in severe anxiety (CYNTHIA M Bulik, 2002). Moreover, anxiety disorders and EDs share similar cognitive and behavioral characteristics (e.g., perfectionism among some patients with anorexia) and it is well documented that premorbid obsessional/anxious traits are prevalent among people with EDs (Nathalie T Godart et al., 2000). It is possible that these traits can become exaggerated during the acute phase of the illness, and that people with these traits are more likely to experience their ED symptoms as stressful and score higher on the EAT-26. However, it is crucial to remember that most kids with anxiety-related conditions (e.g., children with pathological fear of separation) do not develop an ED (Matthies et al., 2018). In any case, it is important to note that the current cross-sectional findings cannot determine whether depression and/or anxiety intensify ED symptoms or whether more severe ED symptoms contribute to the development of depression and/or anxiety. In addition, due to the nature of our data collections, several anxiety-related conditions were grouped together (e.g., panic disorder, specific phobia, social anxiety, obsessive-compulsive disorder, hoarding, hair-pulling, body dysmorphic disorder). Therefore our research design did not enable us to determine whether a specific anxiety-related condition had a stronger impact on ED symptoms than another (Nathalie T Godart et al., 2000). Future studies may examine the differential impact of each of these anxiety-related conditions on ED symptoms.

These findings may make a contribution to clinical practice (Hildebrandt et al., 2012). Several studies have highlighted the importance of taking into account comorbidities in all phases of ED management, including assessment, treatment, and follow-up (Brand-Gothelf et al., 2014; N T Godart et al., 2007; Milos et al., 2002; Pallister & Waller, 2008; Sidor et al., 2015). Our findings add to these studies by emphasizing that depression and anxiety may be differentially related to EDs, and that anxiety may have a stronger link with ED symptoms than does depression. Indeed, current theories argue that people with anxiety disorders share temperamental and personality characteristics (e.g., perfectionism, rigidity, and compulsivity) with people who have EDs, and specifically with people who have anorexia nervosa (Pallister & Waller, 2008). Furthermore, avoidance – a natural behavioral response to anxiety – is extremely common among those with EDs; for example, they make use of this response when they avoid eating high-fat foods or when they don't go to the beach for fear of being seen in a swimming suit. Therefore, our findings suggest that it may be important for clinicians who treat patients with EDs to learn how to adopt strategies akin to those used to treat anxiety (e.g., exposure, self-monitoring, or mindfulness techniques), as these strategies may also be effective for the treatment of EDs (Koskina et al., 2013). For instance, Hildebrandt et al. (Pallister & Waller, 2008) have demonstrated how several forms of exposure-based behavioral interventions, such as exposure to fear of gaining weight and exposure to high-fat foods, can be effective in the treatment of anorexia nervosa.

This is the first study to examine ED symptoms among a large sample that includes volunteers with past/present/no EDs and different comorbidities. One important strength of the current study, which uses an Internet-based sample as opposed to a clinical sample, results from the Berkson's bias – that individuals with more than one diagnoses are more likely to seek clinical care, thereby artificially inflating rates of comorbidities in clinical samples. Several limitations should be noted. **First**, although the current sample was very large and heterogeneous, it was not a representative sample. Participants voluntarily selected to take an online test that measures their implicit attitudes. Nevertheless, data collected from Project Implicit have been studied intensively for several years, and the validity of results is comparable to that of similar data collected in experimental laboratory conditions (Klein et al., 2014; Nosek et al., 2002). **Second**, we don't know what the specific ED diagnosis was, and it could be that the relationships between depression, anxiety, and ED symptoms vary by ED diagnosis. In addition, there are specific anxiety and depression related-conditions (e.g., weight phobia, alexithymia) which were not measured. **Third**, past and present ED diagnoses and comorbidities were assessed by self-report and not according to clinical records. Relatedly, height and weight were also assessed by self-report, which is likely less accurate than objective measurement. However, previous studies show that web responders usually provide accurate information about themselves (Kraut et al., 2004). **Fourth**, participants had to indicate whether they currently suffer from depression and/or anxiety, but information about levels of these two comorbidities were unavailable. **Fifth**, we have decided to include participants with OCD in the anxiety group, given that these two conditions are closely related to each other, and despite the fact that OCD and anxiety are listed in two separate chapters in DSM-5 (Vigne et al., 2019). **Last**, it is important to remember that clinicians and researchers are still struggling with the definition of recovery from EDs (Slof-Op't Landt et al., 2019), and different studies have used different definitions of recovery (e.g., self-assessed vs. objective assessment and partial vs. full abstinence from symptoms). Relatedly, definitions of recovery may vary across research participants.

To conclude, the present study examined ED symptoms among individuals with comorbid depression and anxiety and past/present/no EDs. Future studies are warranted to confirm our cross-sectional findings via the use of prospective designs with clinical assessments of EDs, depression, and anxiety (as opposed to self-report). Prospective designs are warranted as a causal inference is essential for the complete understanding of the relations between comorbidities and ED symptoms before and after the onset of the disorder.

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What is already known on this subject?

Eating Disorders (EDs) are highly correlated with depression and anxiety (CYNTHIA M Bulik, 2002), but it is still largely unknown if comorbid depression alone is associated with more severe ED symptoms relative to comorbid anxiety alone or vice versa. While Bulik et al. (Cynthia M Bulik et al., 1996) suggested that among women with bulimia nervosa there were no difference in ED symptoms in those with only mood disorder relative to those with only anxiety disorder, Hughes et al. (Hughes et al., 2013) suggested that among youth with EDs, depression comorbidity was linked with more complex and severe ED presentation compared with no comorbidity and compared with anxiety comorbidity alone.

What does this study add?

Our findings demonstrated, in contrast with earlier studies (Cynthia M Bulik et al., 1996; Hughes et al., 2013), that comorbid anxiety alone may be linked with more severe ED symptoms relative to comorbid depression alone. Although results are based on cross-sectional data, it is possible that anxiety serves as a maintaining factor for ED symptoms such that dieting and other ED-related behaviors may function to modulate symptoms of anxiety (Lavender et al., 2013).

Table 1:

Participants characteristics by eating disorder history.

		Current ED	Past ED	No ED
		n=374	n=436	n=2,970
Background characteristics				
	Female gender %(n)	90.5(335)	90.6(393)	70.0(2,057)
	Age (SD)	25.34(9.81)	26.32(8.72)	28.53(11.74)
	High Education %(n)	82.4(304)	84.0(361)	84.0(2,404)
	Caucasians %(n)	68.4(256)	73.2(319)	63.3(1,880)
	BMI (SD)	26.12(8.76)	25.28(11.75)	25.42(6.78)
	Eat-26 (SD)	25.84(14.41)	15.92(11.48)	8.52(8.52)
Comorbidities				
	Non %(n)	36.6(137)	58.7(256)	81.4(2,417)
	Only depression %(n)	10.2(38)	6.0(26)	3.6(108)
	Only anxiety %(n)	20.9(78)	17.0(74)	8.5(253)
	Both %(n)	32.4(121)	18.3(80)	6.5(192)

Table 2:

Eating disorder (ED) symptoms by ED history and by comorbidity of depression/anxiety.

	Comorbidity	No ED n=2,970	Past ED n=436	Current ED n=374	All participants n=3,780
Age	Non	28.79 (12.03) ^{ab}	25.14 (6.53) ^a	26.22 (10.19)	28.53 (11.75) ^b
	Only depression	30.17 (12.64) ^b	26.92 (7.71) ^{ab}	28.56 (13.88)	29.53 (12.64) ^b
	Only anxiety	26.08 (9.87) ^a	25.68 (6.54) ^a	24.60 (9.57)	25.57 (9.31) ^a
	Both	27.98 (9.62) ^a	27.47 (8.69) ^b	24.17 (8.06)	26.13 (8.91) ^a
	Test statistics	5.32 p<.001	2.73 p=.043	2.29 p=.078	13.81 p<.001
Females % (n)	Non	68.7 (1620) ^b	89.8 (221)	88.1 (111)	71.5 (1952) ^a
	Only depression	62.1 (64) ^a	85.7 (18)	96.9 (31)	72.4 (113) ^a
	Only anxiety	78.7 (222) ^c	89.2 (74)	89.8 (79)	82.8 (375) ^b
	Both	77.4 (152) ^c	95.3 (80)	91.9 (114)	85.6 (345) ^b
	Test statistics	20.20 p<.001	3.07 p=.38	2.72 p=.44	55.4 p<.001
BMI	Non	25.14 (6.53) ^a	24.50 (6.57)	27.16 (9.32)	25.18 (6.71) ^a
	Only depression	26.92 (7.71) ^{bc}	25.20 (5.74)	27.73 (10.16)	26.85 (8.04) ^a
	Only anxiety	25.68 (6.54) ^a	27.22 (23.72)	25.66 (8.55)	25.95 (11.81) ^{ab}
	Both	27.47 (8.69) ^c	25.81 (6.89)	24.96 (7.79)	26.36 (8.13) ^c
	Test statistics	9.01 p<.001	1.11 p=.35	1.73 p=.16	5.19 p=.001
Eat-26 Total score	Non	8.02 (8.26) ^a	15.22 (11.73) ^{ab}	21.20 (12.78) ^a	9.27 (9.47) ^a
	Only depression	8.50 (6.73) ^a	10.41 (8.14) ^a	20.03 (11.69) ^a	11.12 (9.30) ^b
	Only anxiety	10.77 (10.26) ^b	16.82 (12.01) ^{bc}	26.44 (14.73) ^b	14.94 (13.07) ^c
	Both	11.32 (9.21) ^b	18.51 (10.33) ^c	31.50 (14.31) ^c	19.08 (14.26) ^d
	Test statistics	16.48 p<.001	3.66 p=.013	13.99 p<.001	125.2 p<.001
Eat-26 Dieting score	Non	5.41 (5.83) ^a	10.96 (8.59) ^{bc}	13.71 (8.48) ^a	6.29 (6.66) ^a
	Only depression	5.90 (5.55) ^a	7.36 (5.84) ^{ab}	13.56 (8.53) ^a	7.67 (6.96) ^b
	Only anxiety	7.42 (7.37) ^b	11.42 (8.15) ^{cd}	16.87 (9.49) ^b	10.00 (8.77) ^c
	Both	7.53 (6.74) ^b	13.13 (7.58) ^d	20.25 (8.45) ^c	12.64 (9.29) ^d
	Test statistics	15.4 p<.001	3.23 p=.022	13.33 p<.001	111.3 p<.001
Eat-26 Bulimia score	Non	1.54 (2.19)	1.98 (2.56)	2.25 (3.30) ^a	1.61 (2.29) ^a
	Only depression	1.31 (2.03)	.86 (1.36)	1.44 (2.15) ^a	1.27 (1.97) ^a
	Only anxiety	1.77 (2.36)	2.29 (2.78)	3.88 (4.32) ^b	2.27 (3.02) ^b
	Both	1.84 (2.37)	2.48 (3.01)	4.57 (4.76) ^b	2.82 (3.61) ^c
	Test statistics	2.3 p=.075	2.46 p=.063	9.97 p<.001	125.2 p<.001
Eat-26 Oral control score	Non	1.07 (2.20) ^a	2.29 (3.04)	5.24 (4.06) ^a	1.37 (2.57) ^a
	Only depression	1.29 (1.88) ^{ab}	2.18 (3.32)	5.03 (3.71) ^a	2.18 (2.95) ^b
	Only anxiety	1.58 (2.61) ^{bc}	3.11 (3.34)	5.70 (4.08) ^{ab}	2.66 (3.47) ^b
	Both	1.95 (2.87) ^c	2.90 (3.39)	6.67 (4.09) ^b	3.62 (3.98) ^c
	Test statistics	12.3 p<.001	1.86 p=.136	3.16 p=.024	88.7 p<.001

Notes: Significant group differences appear in bold.

Different superscript letters indicate that post-hoc comparisons suggested that the absolute mean values differ significantly among each column ($p < .05$).

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