



# Eating Disorders

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# Comparing the clinical presentation of eating disorder patients with and without trauma history and/or comorbid PTSD

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## ABSTRACT


This study examined whether clinical characteristics among patients presenting to residential eating disorder (ED) treatment differed according to patients' trauma history and current PTSD diagnostic status. Participants (699 girls and women) completed surveys at treatment onset. One-way analysis of covariance (ANCOVA) tests assessed cross-sectional differences between three groups of patients: those reporting no trauma history (No Trauma,  $n = 185$ ), those with trauma history but without PTSD (Trauma,  $n = 263$ ), and those with current PTSD (PTSD,  $n = 251$ ). Relative to the No Trauma group, the combined Trauma and PTSD groups reported greater ED symptoms, anxiety and depressive symptoms, experiential avoidance, anxiety sensitivity, and lower mindfulness. The PTSD group reported greater ED, anxiety, and depressive symptoms, greater anxiety sensitivity, and lower mindfulness, relative to the Trauma group. In sum, ED patients with any history of trauma experienced more symptoms and other psychopathology relative to patients who did not report trauma history. Among patients reporting trauma, those with current PTSD experienced even greater symptom severity. Interventions focused on improving emotional functioning could be especially beneficial for ED patients with trauma histories.

## Clinical implications

- Eating disorder patients reporting trauma have more severe psychopathology.
- Current post-traumatic stress disorder is linked with greater severity than trauma alone.
- Eating disorder treatment for trauma patients should target emotional functioning.

Traumatic experiences confer risk for developing an eating disorder (Brewerton, 2007). High rates of trauma history are found among those with EDs, with estimates ranging from 37–100% (Dalle Grave, Rigamonti, Todisco, & Oliosio,

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 Supplemental data for this article can be accessed [here](#).

1996; Reyes-

Rodríguez et al., 2011). Furthermore, some research suggests that individuals with EDs who have a history of trauma experience more severe eating psychopathology (Backholm, Isomaa, & Birgegård, 2013; Fullerton, Wonderlich, & Gosnell, 1995) and more severe cognitive, affective, and interpersonal deficits than individuals with EDs who have not experienced trauma (Matsunaga et al., 1999). ED patients with a history of trauma are also likely to have a secondary diagnosis of post-traumatic stress disorder (PTSD): rates of secondary PTSD in ED patients range from 1–52% (Gleaves, Eberenz, & May, 1998; Hepp, Spindler, Schnyder, Kraemer, & Milos, 2007). PTSD, too, may be associated with increased psychopathology in ED patients (Tagay, Schlottbohm, Reyes-Rodríguez, Repic, & Senf, 2014). No research to date has considered the separate roles of trauma history and PTSD in association with increased psychopathology in people with EDs. Understanding which aspects of increased psychopathology are related to trauma, as opposed to PTSD specifically, can inform treatment planning to tailor care to patients' particular clinical characteristics. To that end, we investigated characteristics that differentiate three groups of ED patients: those without trauma, those with trauma but without current PTSD, and those diagnosed with current PTSD.

ED patients with trauma history differ meaningfully from those who develop EDs in the absence of a traumatic event. Trauma history is associated with more severe eating psychopathology, both in subclinical (Holzer, Uppala, Wonderlich, Crosby, & Simonich, 2008) and clinical samples (Backholm et al., 2013; Fullerton et al., 1995; Molendijk, Hoek, Brewerton, & Elzinga, 2017). Trauma is also positively associated with other aspects of psychopathology in people with EDs, including anxiety, interpersonal distrust, interoceptive awareness (Matsunaga et al., 1999), depression (Fullerton et al., 1995) and an increase in psychiatric comorbidity (Brewerton, 2007). However, some research finds that certain types of trauma (i.e. childhood sexual assault), while they are associated with greater risk of developing an ED, are not associated with increased ED severity (Wonderlich, Brewerton, Jovic, Dansky, & Abbott, 1997).

In addition to conferring risk for developing an ED, traumatic experiences increase risk for other comorbid psychopathology, including PTSD (Caffo, Forresi, & Lievers, 2005). ED patients diagnosed with PTSD or complex PTSD (c-PTSD; characterized by prolonged and repeated interpersonal traumas; Lonergan, 2014) need higher levels of care and have poorer outcomes than patients without these diagnoses (Molendijk et al., 2017). Additionally, individuals with anorexia nervosa (AN) and bulimia nervosa (BN) who scored higher on self-reported PTSD symptoms (i.e., PTSD diagnosis was not assessed in a binary manner) experience more severe ED symptoms than those reporting fewer PTSD symptoms (Tagay et al., 2014). Furthermore, PTSD comorbidity in ED patients is associated with lower sense of coherence (a personal resource associated with adaptive coping in stressful circumstances) and self-esteem

(Tagay et al., 2014), greater depressive affect (Grilo, White, Barnes, & Masheb, 2012), and use of greater number of purging behaviors among women with BN (Brewerton, Dansky, O'Neil, & Kilpatrick, 2015). Although these findings indicate that PTSD, rather than trauma in general, may be associated with greater psychopathology in ED patients, many questions remain unanswered about typical clinical presentation, optimal treatment, and expected illness course for patients presenting to treatment with EDs and trauma history and/or PTSD.

Research to date has either compared ED patients diagnosed with PTSD to those not diagnosed with PTSD (regardless of trauma history) or compared ED patients with a history of trauma (regardless of PTSD diagnosis) to those with no history of trauma. Both of these paradigms contribute important insights about the role of trauma in EDs. However, neither paradigm investigates the potentially separate effects of trauma history versus current PTSD on ED and comorbid symptoms. Among individuals who experience trauma, those who develop PTSD display biological, personality, peritraumatic, and posttraumatic vulnerability factors distinguishing them from those who do not develop PTSD (Agaibi & Wilson, 2005). Moreover, PTSD itself is associated with differences in psychological functioning not found in individuals who experience a traumatic event and do not develop PTSD (Bolton et al., 2004). Thus, ED patients with trauma histories who do not develop PTSD may differ significantly from those who do develop PTSD. The current study investigates differences in clinical characteristics between these groups that may have implications for successful treatment.

### **Current study**

The purpose of this study was to describe clinical characteristics associated with trauma history and current PTSD diagnosis in females admitting to residential ED treatment. Our aims were as follows: to test (a) whether ED patients with trauma history (including those with and without a current PTSD diagnosis) differed from ED patients with no trauma history, and (b) whether ED patients with current PTSD (PTSD group) differed from ED patients reporting a trauma history but no current PTSD diagnosis (Trauma group). Trauma group patients may be experiencing subthreshold PTSD symptoms not qualifying for current PTSD diagnosis or may not have developed these symptoms following traumatic experiences. We chose this heterogeneous comparison group in order to highlight clinical characteristics associated with current PTSD, as this may inform treatment decisions. In comparing these groups, we assessed symptom severity and other aspects of psychopathology associated with EDs including mindfulness, experiential avoidance, and anxiety sensitivity (Boswell et al., 2013; Fulton et al., 2012; Wanden-Berghe, Sanz-Valero, & Wanden-Berghe, 2010).

Our hypotheses were as follows:

**Hypothesis 1:** ED patients reporting trauma history (regardless of PTSD diagnosis) would endorse more severe ED symptomatology and internalizing psychopathology, greater anxiety sensitivity and experiential avoidance, and lower mindfulness than patients reporting no history of trauma.

**Hypothesis 2:** ED patients who report a history of trauma without a current PTSD diagnosis would endorse less severe psychopathology compared to ED patients with current PTSD.

## Method

### Participants

This is a secondary analysis from a sample of 928 girls and women with EDs admitting to residential ED treatment at The Renfrew Center's two residential facilities, located in Florida and Pennsylvania, USA, between May 2016 and March 2018. The patient database incorporates data from clinical interviews, questionnaires, and medical charts. ED and co-occurring diagnoses as described in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (APA, 2013) were assigned through a semi-structured interview administered by psychiatric practitioners. Body mass index (BMI) was assessed at intake using electronic medical scales.

Exclusion criteria for the current study included: (1) completing intake procedures prior to the study's measures being collected in the intake battery ( $n = 103$ ) and (2) extremely low Eating Disorder Examination–Questionnaire (EDE-Q) Global score (score  $< 0.50$ , which is more than 1 *SD* below the non-clinical norm and unlikely to be accurate [ $n = 10$ ]; e.g., Thompson-Brenner, Boswell, Espel-Huynh, Brooks, & Lowe, 2018). For patients who had multiple admissions to residential treatment during the time period of interest ( $n = 73$ ), we used only the data from their first admission. These exclusions yielded a final sample of 699. Demographic characteristics and descriptive statistics are shown in Table 1. Participant age ranged from 14 to 75 years ( $mean = 25.27$ ,  $SD = 10.89$ ). Approximately three-quarters were age 18 years or older (76.0%) and most identified as Caucasian (78.1%). The most common primary ED diagnoses were AN (44.9%; roughly half were diagnosed with each AN subtype), BN (26.5%), and other specified feeding or eating disorder (22.3%).

### Measures

#### Trauma history

A pre-admission assessment was conducted in person or over the phone by trained interviewers, who were predominately licensed social workers.

**Table 1.** Comparison of groups on demographic characteristics and descriptive statistics.

	No Trauma <i>n</i> = 185	Trauma <i>n</i> = 263	PTSD <i>n</i> = 251		
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	$\chi^2$	<i>p</i>
Race/Ethnicity				8.19	.77
Caucasian	142 (76.8)	212 (80.6)	192 (76.5)		
Black/African American	7 (3.8)	4 (1.5)	4 (1.6)		
Asian or Pacific Islander	4 (2.2)	5 (1.9)	4 (1.6)		
Hispanic	15 (8.1)	16 (6.1)	23 (9.2)		
Native American/Alaska Native	2 (1.1)	1 (0.4)	4 (1.6)		
Other	5 (2.7)	7 (2.7)	4 (1.6)		
Multiracial	8 (4.3)	14 (5.3)	12 (4.8)		
Missing	2 (1.1)	4 (1.5)	8 (3.2)		
ED diagnosis				33.50	.001
Anorexia nervosa–restricting	59 (31.9)	61 (23.2)	33 (13.1)		
Anorexia nervosa–binge/purge	43 (23.2)	58 (22.1)	60 (23.9)		
Bulimia nervosa	45 (24.3)	68 (25.9)	72 (28.7)		
Binge-eating disorder	2 (1.1)	15 (5.7)	18 (7.2)		
OSFED	36 (19.5)	56 (21.3)	64 (25.5)		
ARFID	0 (0)	3 (1.1)	1 (0.4)		
UFED	0 (0)	2 (0.8)	3 (1.2)		
Comorbid diagnoses					
Mood	125 (67.6)	214 (81.4)	217 (86.5)	24.21	< .001
Anxiety	63 (34.1)	85 (32.3)	33 (13.1)	33.33	< .001
Obsessive–compulsive	19 (10.3)	24 (9.1)	18 (7.2)	1.37	.51
Substance use	29 (15.7)	66 (25.1)	90 (35.9)	22.70	< .001
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>F</i>	<i>p</i>
Age	21.6 (8.3)	25.5 (11.8)	27.8 (10.9)	18.09	< .001
Body mass index	20.4 (6.1)	22.9 (9.7)	25.1 (10.3)	14.29	< .001

OSFED = other specified feeding or eating disorder, ARFID = avoidant and restrictive feeding or intake disorder, UFED = unspecified feeding or eating disorder

Patients were queried about experiences of emotional, physical, or sexual abuse and other significant stressors. Patients reporting any such experiences were classified as having a trauma history. After identifying trauma history and current PTSD diagnoses, patients were divided into three groups: those with no trauma history (No Trauma,  $n = 185$ ), those with trauma history but without current PTSD (Trauma,  $n = 263$ ), and those with trauma history and current PTSD (PTSD,  $n = 251$ ).

### ED symptoms

The EDE-Q (Fairburn & Beglin, 1994) is a 28-item self-report measure based on the Eating Disorder Examination interview, which was used to assess ED symptoms experienced over the 28 days prior to admission to treatment. Global severity scores range from 0 to 6 (sample  $\alpha = .93$ ), with higher scores indicating greater severity.

### Anxiety symptoms

The Overall Anxiety Severity and Impairment Scale (Norman, Hami Cissell, Means-Christensen, & Stein, 2006) was used to determine the severity of

impairment associated with anxiety over the past week (e.g., *In the past week, how much did your anxiety interfere with your ability to do the things you needed to do at work, at school, at home, or in treatment?*). The five-item self-report measure yields scores ranging from 0 to 20; higher scores indicate greater impairment related to anxiety. Items are rated on a 5-point scale ranging from *no/none* to *extreme/all the time* (sample  $\alpha = .86$ ).

### **Anxiety sensitivity**

The Anxiety Sensitivity Index (Reiss, Peterson, Gursky, & McNally, 1986) measures negative beliefs about the physical sensations (e.g., *It scares me when I feel faint*), cognitions, and behaviors associated with the experience of anxiety. It can be used to assess difficulty tolerating anxiety among subjects with a range of anxiety disorders, including PTSD (Marshall, Miles, & Stewart, 2010; Taylor, Koch, & McNally, 1992). The 16 items are measured on a five-point scale ranging from *very little* to *very much*; higher scores indicate greater anxiety sensitivity (sample  $\alpha = .88$ ).

### **Experiential avoidance**

The Brief Experiential Avoidance Questionnaire (BEAQ; Gámez et al., 2014) is a self-report 15-item scale measuring the tendency to avoid distressing thoughts, feelings, and other internal experiences (e.g., *I work hard to keep out upsetting feelings*) on a six-point scale ranging from *strongly disagree* to *strongly agree*. Total scale scores range from 15 to 90 (sample  $\alpha = .85$ ); higher scores indicate more avoidance.

### **Mindfulness**

Mindfulness was assessed with the Southampton Mindfulness Scale (SMQ; Chadwick et al., 2008). The SMQ evaluates the extent to which individuals allow their attention to remain with and accept difficult thoughts as compared to avoiding or judging difficult thoughts or the self. Additionally, it measures the ability to let difficult thoughts pass without reacting. It has 16 items that are measured on a seven-point scale ranging from *disagree totally* to *agree totally* (e.g., *Usually when I experience distressing thoughts and images, they take over my mind for quite a while afterwards*). Scores range from 0 to 96 (sample  $\alpha = .89$ ), with higher scores indicating greater mindfulness (i.e., more adaptive).

### **Depressive symptoms**

The Center for Epidemiologic Studies – Depression scale (CES-D; Radloff, 1977) was used to assess depressive symptoms during the past week and uses a four-point scale ranging from *rarely or none of the time* to *all of the time*. The 20-item measure produces scores ranging from 0 to 60, with higher scores indicating higher severity (sample  $\alpha = .89$ ).



## Procedure

Research staff at the treatment facilities recruited and obtained consent for all participants within one week of admission. Patients were instructed to complete questionnaires such that answers reflected the time period immediately prior to admission to residential treatment. Participants were compensated financially. All research activities were approved by the institutional review boards of The Renfrew Center and [affiliated universities – blinded for review].

## Data analysis

Analyses were conducted using SPSS version 25. Skew and kurtosis within each of the three groups were inspected. Within the PTSD group, ED symptoms displayed negative skew and kurtosis  $>|1|$  and mindfulness displayed kurtosis  $>1$ . The ED symptom variable was reverse scored to correct for negative skew (Field, 2013), then a square-root transformation was applied to the reverse-scored ED symptoms variable and the mindfulness variable (Field, 2013). These transformations resulted in skew and kurtosis  $< |1|$  within all groups. Missing data were minimal and the proportion of missing data ranged from 0 to 3.3%. The pattern of missingness was consistent with missing completely at random ( $\chi^2 [65] = 51.43, p = .89$ ). Missing data were handled with multiple imputation ( $m = 20$ ). Because pooled results were not available for contrasts (see below), all imputed datasets were aggregated, and the aggregated imputed data were used for all analyses.

Analysis of covariance (ANCOVA) tests with planned, orthogonal contrasts were used to identify whether groups differed on ED symptoms, anxiety sensitivity, anxiety symptoms, experiential avoidance, mindfulness, and depressive symptoms. The first contrast examined how trauma overall was associated with clinical presentation, by comparing the No Trauma group to the combined Trauma and PTSD group. The second contrast examined how PTSD was associated with clinical presentation, by comparing the Trauma group to the PTSD group. All ANCOVAs and contrasts included age, BMI, ED, and comorbid diagnoses as covariates, to adjust for their potential effects on outcome variables. Effect sizes ( $r_{\text{contrast}}$ ) were calculated for all contrasts to index the magnitude of group differences, by taking the square root of  $t^2$  divided by  $t^2 + df$  (Field, 2013).

## Results

### Demographic characteristics

Chi-square tests (see Table 1) were completed for all demographic characteristics. Results are summarized here and described in detail in the



Supplemental Materials. Groups did not significantly differ on race or ethnicity. However, significant group differences were found on ED diagnosis; comorbid mood, substance use, and anxiety disorders; age; and BMI. In the No Trauma group, more participants were diagnosed with AN-Restricting subtype but fewer were diagnosed with binge-eating disorder relative to the Trauma and PTSD groups. More participants in the Trauma and PTSD groups had mood disorders and substance use disorders relative to the No Trauma group. However, more participants in the No Trauma and Trauma groups had anxiety disorders, compared to the PTSD group. Relative to patients in the No Trauma group, those in the Trauma group were older and had higher BMI. Relative to patients in the Trauma group, those in the PTSD group were older and had higher BMI.

### ***Clinical characteristics***

ANCOVAs revealed that groups significantly differed on ED symptoms, anxiety sensitivity, anxiety symptoms, experiential avoidance, mindfulness, and depressive symptoms (Table 2). The first contrast tested whether patients without trauma history significantly differed in clinical presentation from patients with any trauma history (No Trauma: - 2, Trauma: +1, PTSD: +1; Table 2). Relative to the No Trauma group, the combined Trauma and PTSD group reported significantly higher ED symptoms, anxiety sensitivity, anxiety symptoms, experiential avoidance, and depressive symptoms. Moreover, the combined Trauma and PTSD group reported lower mindfulness than the No Trauma group.

The second contrast tested whether patients with a trauma history but without current PTSD differed in clinical presentation from patients with a trauma history and current PTSD (No Trauma: 0, Trauma: - 1, PTSD: +1; Table 2). Relative to the Trauma group, the PTSD group reported significantly higher ED symptoms, anxiety sensitivity, anxiety symptoms, and depressive symptoms. Moreover, the PTSD group reported significantly lower mindfulness than the Trauma group. The Trauma and PTSD groups did not significantly differ in experiential avoidance. Taken together, results indicated that trauma history and current PTSD were each associated with greater ED symptoms and anxiety symptoms, and less mindfulness, over and above the effects of age, BMI, ED diagnosis, and comorbid diagnoses.

### **Discussion**

While EDs are positively related to both trauma history and PTSD (Thompson & Wonderlich, 2004; Wonderlich et al., 1997), research to date has not identified potentially unique ways that trauma history versus current PTSD specifically are associated with clinical ED presentation. Thus, this

**Table 2.** Descriptive statistics for eating disorder symptoms and comorbid psychopathology among participants with no trauma history, with trauma history without PTSD, and with trauma history and PTSD.

	No Trauma n = 185		Trauma N = 263		PTSD n = 251		Contrast 1: Trauma			Contrast 2: PTSD				
	M	(SD)	M	(SD)	M	(SD)	F	p	t	p	t	p	r <sub>contrast</sub>	
ED symptoms*	1.69	(0.37)	1.67	(0.38)	1.54	(0.31)	14.05	< .001	-3.17	.002	.12	-4.44	< .001	.17
Anxiety sensitivity	31.32	(12.57)	31.55	(12.18)	34.99	(12.88)	8.34	< .001	2.19	.03	.08	3.59	< .001	.14
Anxiety symptoms	16.55	(4.20)	17.33	(3.94)	18.37	(3.89)	16.43	< .001	4.28	< .001	.16	4.11	< .001	.15
Experiential avoidance	57.67	(12.89)	60.31	(12.46)	62.03	(12.00)	4.05	.02	2.50	.01	.09	1.54	.12	.06
Mindfulness**	5.64	(1.44)	5.25	(1.59)	4.90	(1.38)	13.69	< .001	-4.34	< .001	.16	-3.23	.001	.12
Depressive symptoms	36.46	(11.92)	39.27	(10.87)	41.04	(10.16)	6.94	.001	3.23	.001	.12	2.07	.04	.08

ED = eating disorder; \*Indicates reverse-scored, square-root transformation, where lower scores indicate greater symptoms. \*\*Indicates square-root transformation, where higher scores indicate greater mindfulness (i.e., less symptomatic). Contrast 1 compared the No Trauma group to the combined Trauma and PTSD groups. Contrast 2 compared the Trauma to the PTSD groups.

study examined the contributions of trauma history and current PTSD to the clinical presentation of ED patients.

Trauma history and current PTSD were each associated with several diagnostic and demographic characteristics – namely, binge-eating disorder was more common and AN-restricting subtype was less common in the Trauma and PTSD groups, relative to the No Trauma group. These different proportions of AN and binge-eating disorder likely explain the higher BMI among patients in the Trauma and PTSD groups. Age differences (i.e., the PTSD group was older) could be explained by younger patients' lower likelihood of disclosing their trauma (McElvaney, 2015), individuals with trauma history being more likely to have dropped out from previous ED treatment (Mahon, 2000) and therefore presenting with a longer course of illness, or simply due to trauma exposure increasing with age (Harris & Cumella, 2006). Mood and substance use disorders were most prevalent among those in the PTSD group. This replicates established trends in PTSD comorbidity (Brady, Killeen, Brewerton, & Lucerini, 2000) and three-way comorbidity among PTSD, EDs, and substance use disorders may be common (Deep, Lilienfeld, Plotnicov, Pollice, & Kaye, 1999; Killeen, Brewerton, Campbell, Cohen, & Hien, 2015). Somewhat unexpectedly, anxiety disorders were less common among those in the PTSD group than in the No Trauma and Trauma groups. This is surprising given the historically close association between PTSD and anxiety disorders (APA, 1994). Comorbidity among EDs, PTSD, and anxiety disorders merits further exploration.

Patients with any trauma history (including those diagnosed with PTSD) presented to treatment with higher ED symptomatology, greater severity of depressive and anxiety symptoms, higher anxiety sensitivity, higher experiential avoidance, and lower mindfulness than patients with no trauma history. Thus, our first hypothesis was supported, replicating previous findings that trauma history is associated with greater severity of ED symptoms (Backholm et al., 2013; Fullerton et al., 1995; Molendijk et al., 2017) and a range of other psychopathology including internalizing symptoms (Fullerton et al., 1995; Matsunaga et al., 1999). Our second hypothesis also received support, albeit partial. Patients with current PTSD had greater ED, anxiety, and depressive symptoms; higher anxiety sensitivity; and lower mindfulness relative to patients with trauma history but without PTSD. That is, current PTSD diagnosis is associated with elevated symptoms and other psychopathology in ED patients beyond the effect of trauma alone. These differences emerged despite the potential presence of subthreshold PTSD symptoms or lifetime PTSD history in the Trauma group, suggesting the importance of assessing *current* PTSD symptoms in ED patients. This increased severity in dual-diagnosis patients may limit the efficacy of ED treatment as usual with these patients.

Notably, experiential avoidance did not differ between patients in the Trauma and PTSD groups. This was unexpected, considering that experiential avoidance has been shown to prospectively predict PTSD symptomatology following

traumatic experience (Kumpula, Orcutt, Bardeen, & Varkovitzky, 2011; Marx & Sloan, 2005). However, this result is not without precedent: Elzy and colleagues (2013) showed that avoidant coping predicted *lower* levels of trauma-related symptoms in girls in residential care for complex trauma following exposure to childhood maltreatment. The authors theorized that, at least among younger individuals, avoidance may afford the ability to maintain better psychological functioning while dealing with the effects of trauma. In conjunction with Elzy and colleagues' (2013) conclusions, our findings suggest that avoidance following trauma may be at least temporarily adaptive.

In addition to presenting with greater need for treatment due to higher ED symptoms, ED patients with a history of trauma may require interventions specifically targeting emotional functioning. Higher experiential avoidance and deficits in mindfulness may mean that patients require additional therapeutic intervention to learn healthier coping. Further, greater internalizing symptoms may interfere with improvement in ED symptoms. Indeed, ED patients with a history of trauma have higher rates of relapse and treatment dropout relative to ED patients without such histories (Mahon, Bradeley, Harvey, Winston, & Paler, 2001; Rodríguez, Pérez, & García, 2005). While EDs in general are highly comorbid with internalizing disorders (Kaye, Bulik, Thornton, Barbarich, & Masters, 2004; Lewinsohn, Striegel-Moore, & Seely, 2000), increased depression and anxiety symptoms among ED patients who have experienced trauma may warrant a more transdiagnostic approach to treatment. Transdiagnostic treatment approaches, such as the Unified Protocol (UP; Barlow et al., 2011), have gained popularity recently. Importantly, this approach has been tailored to treat EDs successfully. Compared to a feminist-relational approach, ED patients receiving a variation of the UP tailored for EDs demonstrated greater reductions in experiential avoidance and anxiety sensitivity and greater increases in mindfulness upon discharge from residential ED treatment (Thompson-Brenner et al., 2018). Further, patients receiving the UP showed more positive outcomes on ED symptom severity, depression, and experiential avoidance at six-month follow-up than patients receiving treatment as usual (Thompson-Brenner et al., 2018). These results indicate that transdiagnostic treatments have promise for effectively treating all ED patients, and our results suggest that they may be particularly effective for ameliorating additional impairment in ED patients with trauma history or PTSD. Further research should examine the impact of trauma history and PTSD status on the effectiveness of transdiagnostic ED treatments.

The present study has several strengths, which should be considered in light of the study's limitations. Along with using a large, transdiagnostic sample of women with clinician-rated ED and PTSD diagnoses, we evaluated a wide range of psychopathological factors that can be tied directly to ED treatment aims. To our knowledge, this is the largest study to examine the clinical characteristics associated with trauma and PTSD in patients diagnosed with EDs severe enough to warrant residential treatment. Although data on trauma history were gathered

by qualified interviewers and current PTSD diagnoses were determined by psychiatric practitioners, we did not use a standardized measure to assess traumatic experiences or PTSD diagnosis. Retrospective reports of trauma often do not conform with prospective reporting, perhaps due to reluctance to disclose trauma (McElvaney, 2015) or delayed recall (Elliott, 1997). However, some evidence suggests that interview assessments of trauma history capture more accurate reports than questionnaires (Baldwin, Reuben, Newbury, & Danese, 2019). While our Trauma group served as an appropriate comparison group to isolate characteristics associated with current PTSD, the group was likely heterogeneous with respect to their trauma history. For instance, patients likely varied on trauma type, severity (i.e. whether the stressor falls under PTSD criterion A; American Psychiatric Association, 2013), and dose of trauma. Moreover, patients in our Trauma group may have had a lifetime PTSD diagnosis (currently in remission) and/or current subthreshold PTSD symptoms that could not be quantified within our study design. Furthermore, we were not able to examine subgroups among patients with current PTSD, such as accounting for trauma characteristics, dose, or particular PTSD symptoms (i.e. dissociation). Further investigation into treatment outcomes for ED patients with trauma history or comorbid PTSD receiving transdiagnostic, emotion-focused treatment such as the UP would elucidate whether the particular needs of this group are indeed met by this approach.

In conclusion, the current findings demonstrate that trauma and current PTSD are each associated with increased ED severity and other psychopathology in ED patients. For ED patients with trauma histories, and particularly for those with comorbid current PTSD, elevated anxiety, depression, and experiential avoidance, as well as deficits in mindfulness, may be important treatment targets.

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## Conflict of interest

The authors declare that they have no conflict of interest.

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## References

- Agaibi, C. E., & Wilson, J. P. (2005). Trauma, PTSD, and resilience: A review of the literature. *Trauma, Violence, & Abuse*, 6(3), 195–216. doi:10.1177/1524838005277438
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.
- Backholm, K., Isomaa, R., & Birgegård, A. (2013). The prevalence and impact of trauma history in eating disorder patients. *European Journal of Psychotraumatology*, 4(1), 22482. doi:10.3402/ejpt.v4i0.22482
- Baldwin, J. R., Reuben, A., Newbury, J. B., & Danese, A. (2019). Agreement between prospective and retrospective measures of childhood maltreatment: A systematic review and meta-analysis. *JAMA Psychiatry*. doi:10.1001/jamapsychiatry.2019.0097
- Barlow, D. H., Farchione, T. J., Fairholme, C. P., Ellard, K. K., Boisseau, C. L., & Allen, L. B. (2011). *Unified protocol for transdiagnostic treatment of emotional disorders: Therapist guide*. New York, NY: Oxford University Press.
- Bolton, D., Hill, J., O'ryan, D., Udwin, O., Boyle, S., & Yule, W. (2004). Long-term effects of psychological trauma on psychosocial functioning. *Journal of Child Psychology and Psychiatry*, 45(5), 1007–1014. doi:10.1111/j.1469-7610.2004.t01-1-00292.x
- Boswell, J. F., Farchione, T. J., Sauer-Zavala, S., Murray, H. W., Fortune, M. R., & Barlow, D. H. (2013). Anxiety sensitivity and interoceptive exposure: A transdiagnostic construct and change strategy. *Behavior Therapy*, 44(3), 417–431. doi:10.1016/j.beth.2013.03.006
- Brady, K. T., Killeen, T. K., Brewerton, T., & Lucerini, S. (2000). Comorbidity of psychiatric disorders and posttraumatic stress disorder. *The Journal of Clinical Psychiatry*, 61, 22–32.
- Brewerton, T. D. (2007). Eating disorders, trauma, and comorbidity: Focus on PTSD. *Eating Disorders*, 15(4), 285–304. doi:10.1080/10640260701454311
- Brewerton, T. D., Dansky, B. S., O'Neil, P. M., & Kilpatrick, D. G. (2015). The number of divergent purging behaviors is associated with histories of trauma, PTSD, and comorbidity in a national sample of women. *Eating Disorders: the Journal of Treatment & Prevention*, 23(5), 422–429. doi:10.1080/10640266.2015.1013394
- Caffo, E., Forresi, B., & Lievers, L. S. (2005). Impact, psychological sequelae and management of trauma affecting children and adolescents. *Current Opinion in Psychiatry*, 18(4), 422–428. doi:10.1097/01.yco.0000172062.01520.ac
- Chadwick, P., Hember, M., Symes, J., Peters, E., Kuipers, E., & Dagnan, D. (2008). Responding mindfully to unpleasant thoughts and images: Reliability and validity of the Southampton Mindfulness Questionnaire (SMQ). *British Journal of Clinical Psychology*, 47(4), 451–455. doi:10.1348/014466508X314891
- Dalle Grave, R., Rigamonti, R., Todisco, P., & Oliosi, E. (1996). Dissociation and traumatic experiences in eating disorders. *European Eating Disorders Review: the Professional Journal of the Eating Disorders Association*, 4(4), 232–240. doi:10.1002/(ISSN)1099-0968
- Deep, A. L., Lilenfeld, L. R., Plotnicov, K. H., Pollice, C., & Kaye, W. H. (1999). Sexual abuse in eating disorder subtypes and control women: The role of comorbid substance dependence in bulimia nervosa. *International Journal of Eating Disorders*, 25(1), 1–10.
- Elliott, D. M. (1997). Traumatic events: Prevalence and delayed recall in the general population. *Journal of Consulting and Clinical Psychology*, 65(5), 811. doi:10.1037/0022-006X.65.5.811
- Elzy, M., Clark, C., Dollard, N., & Hummer, V. (2013). Adolescent girls' use of avoidant and approach coping as moderators between trauma exposure and trauma symptoms. *Journal of Family Violence*, 28(8), 763–770. doi:10.1007/s10896-013-9546-5



- Fairburn, C. G., & Beglin, S. J. (1994). Assessment of EDs: Interview or self-report questionnaire? *International Journal of Eating Disorders*, 16(4), 363–370.
- Field, A. (2013). *Discovering statistics using IBM SPSS Statistics*. Thousand Oaks, CA: Sage Publications.
- Fullerton, D. T., Wonderlich, S. A., & Gosnell, B. A. (1995). Clinical characteristics of eating disorder patients who report sexual or physical abuse. *International Journal of Eating Disorders*, 17(3), 243–249.
- Fulton, J. J., Lavender, J. M., Tull, M. T., Klein, A. S., Muehlenkamp, J. J., & Gratz, K. L. (2012). The relationship between anxiety sensitivity and disordered eating: The mediating role of experiential avoidance. *Eating Behaviors*, 13(2), 166–169. doi:10.1016/j.eatbeh.2011.12.003
- Gámez, W., Chmielewski, M., Kotov, R., Ruggero, C., Suzuki, N., & Watson, D. (2014). The brief experiential avoidance questionnaire: Development and initial validation. *Psychological Assessment*, 26(1), 35. doi:10.1037/a0034473
- Gleaves, D. H., Eberenz, K. P., & May, M. C. (1998). Scope and significance of posttraumatic symptomatology among women hospitalized for an eating disorder. *International Journal of Eating Disorders*, 24(2), 147–156.
- Grilo, C. M., White, M. A., Barnes, R. D., & Masheb, R. M. (2012). Posttraumatic stress disorder in women with binge eating disorder in primary care. *Journal of Psychiatric Practice*, 18(6), 408. doi:10.1097/01.pra.0000422738.49377.5e
- Harris, M., & Cumella, E. J. (2006). Eating disorders across the life span. *Journal of Psychosocial Nursing and Mental Health Services*, 44(4), 20–26.
- Hepp, U., Spindler, A., Schnyder, U., Kraemer, B., & Milos, G. (2007). Post-traumatic stress disorder in women with eating disorders. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, 12(1), e24–e27. doi:10.1007/BF03327778
- Holzer, S. R., Uppala, S., Wonderlich, S. A., Crosby, R. D., & Simonich, H. (2008). Mediation significance of PTSD in the relationship of sexual trauma and eating disorders. *Child Abuse & Neglect*, 32(5), 561–566. doi:10.1016/j.chiabu.2007.07.011
- Kaye, W. H., Bulik, C. M., Thornton, L., Barbarich, N., & Masters, K.; Price Foundation Collaborative Group. (2004). Comorbidity of anxiety disorders with anorexia and bulimia nervosa. *American Journal of Psychiatry*, 161(12), 2215–2221. doi:10.1176/appi.ajp.161.12.2215
- Killeen, T., Brewerton, T. D., Campbell, A., Cohen, L. R., & Hien, D. A. (2015). Exploring the relationship between eating disorder symptoms and substance use severity in women with comorbid PTSD and substance use disorders. *The American Journal of Drug and Alcohol Abuse*, 41(6), 547–552. doi:10.3109/00952990.2015.1080263
- Kumpula, M. J., Orcutt, H. K., Bardeen, J. R., & Varkovitzky, R. L. (2011). Peritraumatic dissociation and experiential avoidance as prospective predictors of posttraumatic stress symptoms. *Journal of Abnormal Psychology*, 120(3), 617. doi:10.1037/a0023927
- Lewinsohn, P. M., Striegel-Moore, R. H., & Seeley, J. R. (2000). Epidemiology and natural course of eating disorders in young women from adolescence to young adulthood. *Journal of the American Academy of Child & Adolescent Psychiatry*, 39(10), 1284–1292. doi:10.1097/00004583-200010000-00016
- Lonergan, M. (2014). Cognitive behavioral therapy for PTSD: The role of complex PTSD on treatment outcome. *Journal of Aggression, Maltreatment & Trauma*, 23(5), 494–512. doi:10.1080/10926771.2014.904467
- Mahon, J. (2000). Dropping out from psychological treatment for eating disorders: What are the issues? *European Eating Disorders Review: the Professional Journal of the Eating Disorders Association*, 8(3), 198–216. doi:10.1002/(ISSN)1099-0968
- Mahon, J., Bradley, S. N., Harvey, P. K., Winston, A. P., & Palmer, R. L. (2001). Childhood trauma has dose-effect relationship with dropping out from psychotherapeutic treatment for bulimia nervosa: A replication. *International Journal of Eating Disorders*, 30(2), 138–148.



- Marshall, G. N., Miles, J. N., & Stewart, S. H. (2010). Anxiety sensitivity and PTSD symptom severity are reciprocally related: Evidence from a longitudinal study of physical trauma survivors. *Journal of Abnormal Psychology, 119*(1), 143. doi:10.1037/a0018009
- Marx, B. P., & Sloan, D. M. (2005). Peritraumatic dissociation and experiential avoidance as predictors of posttraumatic stress symptomatology. *Behaviour Research and Therapy, 43* (5), 569–583. doi:10.1016/j.brat.2004.04.004
- Matsunaga, H., Kaye, W. H., McConaha, C., Plotnicov, K., Pollice, C., Rao, R., & Stein, D. (1999). Psychopathological characteristics of recovered bulimics who have a history of physical or sexual abuse. *Journal of Nervous and Mental Disease, 187*(8), 472–477.
- McElvaney, R. (2015). Disclosure of child sexual abuse: Delays, non-disclosure and partial disclosure. What the research tells us and implications for practice. *Child Abuse Review, 24* (3), 159–169. doi:10.1002/car.v24.3
- Molendijk, M. L., Hoek, H. W., Brewerton, T. D., & Elzinga, B. M. (2017). Childhood maltreatment and eating disorder pathology: A systematic review and dose-response meta-analysis. *Psychological Medicine, 47*(8), 1402–1416. doi:10.1017/S0033291716003561
- Norman, S. B., Hami Cissell, S., Means-Christensen, A. J., & Stein, M. B. (2006). Development and validation of an overall anxiety severity and impairment scale (OASIS). *Depression and Anxiety, 23*(4), 245–249. doi:10.1002/da.20182
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*(3), 385–401. doi:10.1177/014662167700100306
- Reiss, S., Peterson, R. A., Gursky, D. M., & McNally, R. J. (1986). Anxiety sensitivity, anxiety frequency and the prediction of fearfulness. *Behaviour Research and Therapy, 24*(1), 1–8. doi:10.1016/0005-7967(86)90143-9
- Reyes-Rodríguez, M. L., Ann Von Holle, T., Thornton, L. M., Klump, K. L., Brandt, H., Crawford, S., ... Jones, I. (2011). Post traumatic stress disorder in anorexia nervosa. *Psychosomatic Medicine, 73*(6), 491. doi:10.1097/PSY.0b013e31822232bb
- Rodríguez, M., Pérez, V., & García, Y. (2005). Impact of traumatic experiences and violent acts upon response to treatment of a sample of Colombian women with eating disorders. *International Journal of Eating Disorders, 37*(4), 299–306. doi:10.1002/eat.20091
- Tagay, S., Schlotzbohm, E., Reyes-Rodriguez, M. L., Repic, N., & Senf, W. (2014). Eating disorders, trauma, PTSD, and psychosocial resources. *Eating Disorders: The Journal Of Treatment & Prevention, 22*(1), 33–49. doi:10.1080/10640266.2014.857517
- Taylor, S., Koch, W. J., & McNally, R. J. (1992). How does anxiety sensitivity vary across the anxiety disorders? *Journal of Anxiety Disorders, 6*(3), 249–259. doi:10.1016/0887-6185(92)90037-8
- Thompson, K. M., & Wonderlich, S. A. (2004). Child sexual abuse and eating disorders. In J. K. Thompson (Ed.), *Handbook of eating disorders and obesity* (pp. 679–694). Hoboken, NJ, US: John Wiley & Sons Inc.
- Thompson-Brenner, H., Boswell, J. F., Espel-Huynh, H., Brooks, G., & Lowe, M. R. (2018). Implementation of transdiagnostic treatment for emotional disorders in residential eating disorder programs: A preliminary pre-post evaluation. *Psychotherapy Research, 19*, 1–17. doi:10.1080/10503307.2018.1446563
- Wanden-Berghe, R. G., Sanz-Valero, J., & Wanden-Berghe, C. (2010). The application of mindfulness to eating disorders treatment: A systematic review. *Eating Disorders, 19*(1), 34–48. doi:10.1080/10640266.2011.533604
- Wonderlich, S. A., Brewerton, T. D., Jovic, Z., Dansky, B. S., & Abbott, D. W. (1997). Relationship of childhood sexual abuse and eating disorders. *Journal of the American Academy of Child & Adolescent Psychiatry, 36*(8), 1107–1115. doi:10.1097/00004583-199708000-00018