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Comorbidity of Partial and Subthreshold PTSD among Men and Women with Eating Disorders in the National Comorbidity Survey-Replication Study

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Abstract

Objective—The comorbidity of posttraumatic stress disorder (PTSD) and eating disorders (EDs) is high among women but has been understudied in men. Little is known about the association between partial or subthreshold PTSD and EDs among women or men.

Method—This study included PTSD and ED data from male ($n=2382$) and female ($n=3310$) National Comorbidity Survey-Replication study participants.

Results—The vast majority of women and men with anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (BED) reported a history of interpersonal trauma. Rates of PTSD were significantly higher among women and men with BN and BED. Subthreshold PTSD was more prevalent than threshold PTSD among women with BN and women and men with BED.

Discussion—Interpersonal forms of trauma, PTSD, and subthreshold/partial PTSD, were prevalent among men and women with EDs. Findings highlight the importance of assessing for trauma and PTSD in ED patients.

Trauma exposure is considered a non-specific risk factor for eating disorders (1). In particular, the association between childhood sexual abuse and disordered eating has been studied fairly extensively among women (2). More recent investigations have included other forms of childhood abuse (3-5) as well as adult victimization among women (3, 4) and men (5); however, most studies to date have not included an extensive range of trauma types.

The exact mechanisms through which trauma contributes to the etiology of eating disorders are not entirely clear. Exposure to traumatic stress may contribute to general psychobiological dysregulation (6), which could increase susceptibility to a variety of psychiatric disorders. Further, sexual trauma may directly impact one's body image (7);

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however, this association might be fully or partly mediated by the development of a self-critical view following trauma exposure (8). In the case of eating disorders, this self-criticism may be focused on one's physical appearance, leading to the use of extreme methods to achieve the thin-ideal. Moreover, some victims of sexual trauma may wish to be thinner, to minimize secondary sex characteristics and appear less attractive to potential perpetrators.

It has been suggested that the development of PTSD may fully or partially mediate the relation between trauma and disordered eating (2). Among participants in the population-based National Women's Study, 36.9% of participants with bulimia nervosa (BN), 21% with binge eating disorder (BED), and 11.8% of non-BN/non-BED women met criteria for lifetime PTSD (9). Despite these high rates, the comorbidity of EDs and PTSD remains understudied, possibly because these disorders have very different clinical presentations.

Although they do not share core criteria, many of the associated features of PTSD and EDs overlap (10). High rates of dissociation, as well as alexithymia, have been described among individuals with EDs as well as PTSD (3, 11-14). Bingeing or purging might serve as a means of dissociation to "escape from" PTSD symptoms (4, 15-17). Further, it has been suggested that emotion dysregulation is a key developmental factor in both disorders (18-21), and subsets of individuals with both EDs and PTSD are characterized by impulsivity (22-28). These shared features may explain why anorexia nervosa (AN) binge/purge type, BN, and BED are more frequently comorbid with PTSD compared with AN-restricting type (2, 15, 17, 29-31). However, it is difficult to determine whether the impulsivity associated with these self-harming behaviors was evident prior to the trauma experience or whether it was triggered by the trauma exposure (9, 32).

EDs and PTSD also may share common genetic and biological vulnerabilities. Hypothalamic-pituitary-adrenal (HPA) axis dysfunction has been described in both disorders (33, 34). In addition, genetic variation in the serotonin, dopamine, glucocorticoid, and neuropeptide Y (NPY) systems may predispose some individuals to both PTSD (35-39) and disordered eating (40-44). Thus, PTSD and EDs may be comorbid because of shared biological, genetic, and psychosocial vulnerabilities.

To date, studies of EDs and PTSD have predominantly included female samples, as most EDs are far more prevalent among women than men (45). However, rates of binge eating and BED appear more similar across genders (46, 47). Given the strong association between PTSD and binge eating and/or purging (9, 15, 48), males with PTSD might be particularly susceptible to the development of comorbid ED symptoms. Across genders, similar associations between PTSD and EDs have been reported in the few studies that have included men. Lipschitz and colleagues (49) found that hospitalized adolescent males with PTSD were more likely to have comorbid EDs than were males without PTSD diagnoses. To date, there are no published data regarding rates of PTSD among males with EDs, underscoring the need for further research among men.

The diagnostic criteria for PTSD are among the most hotly debated in the psychiatric nosology (50). This disorder's criteria have been substantially revised since its introduction in the *Diagnostic and Statistical Manual of Mental Disorders-III (DSM-III)*. Major revisions also are proposed for *DSM-5*. Given the controversy regarding the PTSD diagnosis, examination of partial and subthreshold forms of PTSD (51) could yield useful information about PTSD-ED comorbidity. Brewerton (2) reported unpublished, preliminary analyses regarding subthreshold/partial PTSD and disordered eating from the National Women's Study. A total of 37% of women with BN met criteria for lifetime PTSD; an additional 15% met criteria for one cluster of lifetime PTSD symptoms, and an additional 13% met criteria

for two clusters. To date, only one investigation of subthreshold PTSD among women with EDs has been published. Inniss and colleagues (52) examined these comorbid conditions among a sample of Canadian patients with BN ($n=78$) and non-ED controls ($n=61$). They defined subthreshold PTSD as meeting *DSM-IV* Criterion A (traumatic event), and criteria for two of the three symptom clusters, with duration of symptoms for at least one month and endorsement of at least one symptom for each cluster. Among women with BN, the rate of threshold PTSD was 17.9%, while subthreshold PTSD was evident in 41.0%. These rates were 6.6% and 14.8% among non-ED controls. Women with BN and PTSD had higher rates of sexual and physical victimization than women with BN but no PTSD and non-ED women without PTSD.

Currently, there are no published studies of partial/subthreshold PTSD among individuals with EDs in a population-based sample. Thus, the current study had two primary aims: to evaluate rates of PTSD among men with EDs and to evaluate rates of subthreshold and partial PTSD among women and men with EDs. A secondary aim was to examine rates of specific types of trauma among men and women by ED status.

Method

Participants

Participants were 2392 men and 3310 women from Part II of the National Comorbidity Survey-Replication (NCS-R). Part I of the NCS-R study included a total of 9282 participants; the 5692 individuals who participated in Part II included those who reported a lifetime history of any Part I disorder plus an additional probability sample of other respondents. PTSD was assessed in Part II of the survey. EDs were assessed among a probability subsample ($n=1220$ men and 1760 women) from Part II.

Measures

The World Health Organization Composite International Diagnostic Interview (CIDI) was used to assess *DSM-IV* and *ICD-10* disorders (53). This structured interview was administered face-to-face, using laptop computer assisted personal interview. Each item is scored yes/no. Because of the length of time required to complete this interview, skip-outs were used for each diagnosis.

Traumatic events—Participants were asked whether they had ever been exposed to a variety of traumatic events, including combat, a life-threatening accident, a major natural disaster, or physical or sexual assault. A complete list of trauma forms assessed is available at

[http://www.icpsr.umich.edu/files/CPES/diagnostics/DSM-](http://www.icpsr.umich.edu/files/CPES/diagnostics/DSM-IV_Posttraumatic_Stress_Disorder.pdf)

[IV_Posttraumatic_Stress_Disorder.pdf](http://www.icpsr.umich.edu/files/CPES/diagnostics/DSM-IV_Posttraumatic_Stress_Disorder.pdf). Individuals who endorsed exposure to a given traumatic event were asked their age at the time of the event and the frequency or duration of the event, as appropriate.

PTSD—The algorithms used to diagnose *DSM-IV* PTSD are available at <http://www.hcp.med.harvard.edu/ncs/diagnosis.php>. Participants who had never experienced a traumatic event (Criterion A) skipped to the next section of the interview. PTSD symptoms were assessed for the participant-identified worst trauma as well as an event chosen at random by the interviewer (for those participants who reported experiencing more than one trauma). Criterion C (avoidance/numbing) was assessed first. Participants who reported no avoidance symptoms skipped the remainder of the PTSD interview. Similarly, participants who reported no Criterion B (re-experiencing) symptoms skipped to the next section, as did those who reported no Criterion D (hyperarousal) symptoms. At least two Criterion B

symptoms, three Criterion C symptoms, and one Criterion D symptom must have been present for at least one month (Criterion E) and cause significant distress (Criterion F) to yield a *DSM-IV* PTSD diagnosis.

For the current study, these algorithms were modified to diagnose several forms of partial and subthreshold PTSD. Subthreshold PTSD diagnoses, in which at least some symptoms are present for all clusters, included AB(C)DEF, in which at least one symptom is endorsed for cluster C (but the *DSM-IV* criterion of at least three symptoms is not met), and ABC(D)EF, in which at least one symptom is endorsed for cluster D (but the *DSM-IV* criterion of at least two symptoms is not met). Partial PTSD, in which symptoms from one cluster may be absent, included ABCEF, ABDEF, and ACDEF. Finally, ages at the worst and randomly chosen events were recorded.

Eating Disorders—ED algorithms used in the current study were described previously by Hudson et al. (46). The version of the CIDI used in the NCS-R assesses *DSM-IV* and ICD-10 AN and BN. BED, currently included in the appendix of the *DSM-IV* as a set of criteria for further study, also was assessed. However, although the *DSM* requires at least six months of binge eating in order to qualify for a diagnosis of BED, the CIDI asked only whether symptoms were present for three months.

Participants who did not report both a time in their lives when they had a great deal of concern about, or strongly feared, being too fat or overweight and, that they had had this strong worry or fear at a time when they really weighed less than most other people, skipped to the BN section. Similarly, participants who did not report ever having eating binges at least twice per week for several months or longer skipped subsequent questions assessing BN and BED criteria. Inappropriate weight loss strategies, including fasting, taking diuretics or weight control medicines, self-induced vomiting, taking laxatives or enemas, and excessive exercise, were assessed in the BN section.

Procedure

The NCS-R design has been described previously (54). Briefly, participants were interviewed between February 2001 and December 2003 (55). The researchers used a multistage clustered area probability design. The response rate for the NCS-R was 70.9%. The Human Subjects Committees of Harvard Medical School and the University of Michigan approved the original study. The Institutional Review Board of VA Boston Healthcare System approved the analyses conducted in the current investigation.

Statistical Analyses

Sample weights (54) were used to adjust for non-response and bias in selection of Part II participants. PROC TTEST and PROC MEANS were used to compute descriptive statistics. The PROC SURVEYFREQ method in SAS (version 9.2), which uses Taylor series linearization to compare a ratio of the estimator of cell total frequency to the estimator of the overall population, was employed to compute rates of diagnoses and Rao-Scott chi-square tests comparing PTSD diagnoses and trauma types across ED status. Because of the large number of statistical tests, only those reaching $p < .01$ were considered significant.

Results

Descriptives

Demographics are reported for men and women in the total sample and by eating disorder status in Supplementary Tables 1-2. The mean age for men in the Part II sample was 43.21 ($SD=16.11$; Range=18-93); the mean age for women was 44.01 ($SD=16.65$; Range=18-99).

The majority of men (73.65%) and women (71.96%) were White, as this sample reflects the race distribution in the U.S. population at the time of the survey. In terms of education, 15.70% of women and 17.95% of men had completed 0-11 years of school, 33.52% of women and 31.30% of men had completed 12 years, 28.39% of women and 26.59% of men had completed 13-15 years, and 22.38% of women and 24.06% of men had completed ≥ 16 years. The average household income was \$52,614.49 ($SD=44,000.28$) for women and \$66804.46 ($SD=53,654.48$) for men.

Race did not differ among women and men with BN, BED, or AN (all p 's $> .01$). Education level and mean household income did not differ among women with BN, BED, or AN, or among men with BED or AN (all p 's $> .01$); however, men with BN had achieved a higher level of education on average ($p < 0.001$), and reported a higher mean household income ($p < 0.01$), than men without BN.

A total of 4984 participants, including 2845 women (79.44% [weighted]) and 2109 men (84.05% [weighted]) reported ever having experienced a form of trauma. Only 191 (8.00%) women and 46 men (2.40%) endorsed both AN skip-out items; 133 (4.96%) women and 63 (4.22%) men reported ever bingeing at least twice per week for several months or longer.

The prevalence of PTSD was 9.71% among women and 3.59% among men. Not surprisingly, rates of partial and subthreshold PTSD were higher than those of PTSD among both men and women. This difference was particularly salient for subthreshold form AB(C)DEF (11.52% and 4.88%) and partial form ABDEF (11.58% and 4.93%). Estimates are summarized in Table 1.

Types of trauma

Rates of trauma types were compared across women and men by ED status (see Table 2 for chi-square analysis results). Women with lifetime BN ($n=45$) reported high rates of any type of trauma (100%), as well as any type of interpersonal trauma (78.21%). Relative to women without BN, they were specifically more likely to report exposure to life-threatening automobile accidents, beating by parents/guardians, beating by romantic partners, beating by other individuals, rape, sexual assault other than rape, stalking, vicarious trauma, serious physical fights in the home during childhood, witnessing someone else be injured/killed, or to have purposefully injured/tortured/killed someone else (all p 's < 0.01). Similarly, 90.33% of women with lifetime BED ($n=75$) reported any type of trauma and 63.67% endorsed any type of interpersonal trauma. Relative to women without BED, they were significantly more likely to report exposure including life-threatening automobile accidents, beating by parents/guardians, beating by romantic partners, beating by other individuals, sexual assault other than rape, stalking, and serious physical fights in the home during childhood (all p 's < 0.01). Although 100% of women with AN ($n=18$) reported experiencing any form of trauma, and 71.16% reported exposure to interpersonal trauma, none of the chi-squares reached significance at $p < 0.01$, likely due to low power.

Rates of AN, BN, and BED were compared between women with trauma exposure but no PTSD and trauma + PTSD (see Supplementary Tables 4-6). Rates of EDs were generally higher in the trauma + PTSD group. Particularly noteworthy were the high rates of BN among women who had PTSD and reported being civilians in a place of revolution/war (16.92%), being civilians in a place of ongoing terror (6.72%), severe automobile accidents (5.81%), beating by parents (5.19%), rape (4.23%), and witnessing serious physical fights in the home (6.33%). Similarly, high rates of BED were found among women who had PTSD and reported being civilians in a place of ongoing terror (16.42%), beating by parents (9.26%), beating by other individuals (10.31%), and stalking (7.43%). Rates of AN among

women with trauma + PTSD were not significantly higher than those among women with only trauma exposure.

Men with a lifetime history of BN ($n=7$) reported high rates of any type of trauma (100%), as well as any form of interpersonal trauma (100%). Relative to men without BN, they were significantly more likely to report exposure to combat, terror of civilians, toxins, beating by romantic partners, mugging, rape, stalking, unexpected death of someone close, vicarious trauma, serious physical fights in the home during childhood, witnessing someone else be injured/killed, or to have accidentally or purposefully injured/tortured/killed someone else (all $p's < 0.01$; see Table 2). Similarly, 98.40% of men with lifetime BED ($n=30$) reported any type of trauma, and 74.34% endorsed any form of interpersonal trauma. Relative to men without BED, they were significantly more likely to report exposure to toxins, severe automobile accidents, man-made disasters, beating by parents, beating by romantic partners, mugging, rape, stalking, unexpected death of someone close, vicarious trauma, witnessing someone else be injured/killed, or to have accidentally or purposefully injured/tortured/killed someone else (all $p's < 0.01$). Of the men with lifetime histories of AN ($n=3$), 100% reported exposure to any trauma, and 68.16% reported any interpersonal trauma. Relative to individuals without AN, they were significantly more likely to report exposure to terror of civilians, beating by romantic partners, and sexual assault other than rape (all $p's < 0.01$).

Rates of AN, BN, and BED were compared among men with trauma exposure, with and without PTSD. Rates of BN and BED were higher for nearly all traumas among the trauma + PTSD group, compared to the trauma only group (see Supplementary Tables 4-6). Of particular note are the high rates of BN and BED among men who reported beating by partners (54.52% each), stalking (24.88% and 30.36%), accidentally harming someone (25.08% each), and purposefully harming someone (19.31% and 21.83%). Rates of AN among men with trauma + PTSD were not significantly higher than those among men with only trauma exposure.

Comorbidity

Chi-square tests were used to compare rates of all forms of PTSD among men and women with and without EDs (see Table 1 and Supplementary Table 3). Of the 18 women with AN, four (16.09%; $p < 0.36$) had lifetime PTSD. Less than one percent (0.71%) of individuals with any form of PTSD had AN ($p's < 0.32-0.39$). Thus, although women with AN had higher rates of PTSD than women without AN, these differences were non-significant.

A total of 18 women with BN (39.81%; $p < 0.001$) and 20 women with BED (25.74%; $p < 0.001$) had a lifetime history of PTSD. An additional 7.48% (47.29% total) of women with BN met criteria for AB(C)DEF and ABDEF ($p's < 0.001$); an additional 1.9% (27.64% total) of women with BED met criteria for AB(C)DEF and ABDEF ($p's < 0.001$). A total of 3.21% and 4.40% of women with PTSD had BN and BED, respectively. Rates of BN among women with partial or subthreshold PTSD were 3.11-3.22%; rates of BED ranged from 3.96 to 4.36. Thus women with BN and with BED were significantly more likely to meet criteria for PTSD than were women without BN or BED, and rates of AB(C)DEF and ABDEF were higher than the rates of *DSM-IV* PTSD among these women.

Only three men had a lifetime history of AN; none reported lifetime PTSD, AB(C)DEF, ABDEF, or ACDEF. One man with AN met criteria for ABC(D)EF and ABCEF ($p's < 0.01$). A total of three men with BN (66.19%), and seven men with BED (24.02%) met criteria for full PTSD ($p's < 0.001$). Men with BN had comparable rates of all full, subthreshold, and partial forms of PTSD (66.19%; all $p's < 0.001$). An additional 1.66% (25.68% total) of men with BED met criteria for AB(C)DEF and ABDEF compared to full PTSD ($p's < 0.001$). A total of 4.23% and 6.66% of men with PTSD met criteria for lifetime BN and BED,

respectively. Rates of BN among men with partial and subthreshold PTSD ranged from 3.05% to 4.09%. Rates of BED among men with partial and subthreshold PTSD ranged from 5.18% to 6.59%. Thus, men with BN and BED were significantly more likely to report PTSD than were men without BN or BED. Rates of subthreshold and partial PTSD among men with BN did not differ, relative to rates of *DSM-IV* PTSD; however, men with BED had higher rates of AB(C)DEF and ABDEF than *DSM-IV* PTSD. In sum, PTSD seems to confer additional risk for disordered eating, above and beyond that due to trauma exposure alone, and this pattern appears particularly strong for men.

Discussion

Previous research has suggested a link between trauma experiences and PTSD and ED symptoms, especially binge eating and purging (2, 9, 17, 29). Although PTSD and trauma are relatively common among men (56), the majority of extant research has almost exclusively relied on female samples. In addition, given the debate about PTSD diagnostic criteria (50), it is important to examine both the rates of various subthreshold forms of this diagnosis, as well as their associations with EDs. The current study investigated these issues in a population-based sample of men and women.

Results demonstrated that rates of nearly all traumas assessed were higher among women and men with BN and BED, compared with the general population. This finding was particularly striking with respect to interpersonal traumas. For example, approximately 40% of women with BN reported a history of rape or sexual assault other than rape; these rates were nearly 20% and 35%, respectively, among women with BED. Nearly 60% of men with BN reported having been beaten by a romantic partner or stalked. The vast majority of men with BN reported exposure to violence, including mugging, witnessing serious fights in the home, or witnessing the injury of another individual or seeing a dead body. Approximately 26% of men with BED reported having been beaten by their parents. Thus, both men and women with EDs, particularly BN, have high rates of trauma perpetrated by others. These rates are especially high among individuals with EDs as well as PTSD.

Findings also highlighted the high rates of PTSD among women and men with BN and BED. However, it should also be noted that the majority of women with AN, BN, and BED, and the majority of men with AN and BED, did not have comorbid PTSD. This finding again emphasizes the multi-faceted etiology of EDs, and suggests that, although trauma history should be assessed with patients at intake, these exposures might not have a direct causal link to current manifestations of eating pathology. As with many complex disorders, the etiology of PTSD and EDs does not suggest a “one size fits all” conceptualization; rather, the onset and maintenance, and patterns of comorbidity, likely result from interplay of psychosocial, biological and genetic factors. Future studies could use a qualitative approach to further examine the psychosocial processes involved in the association between trauma and disordered eating. In addition, further genetic and epigenetic investigations of causal mechanisms are needed.

Rates of subthreshold PTSD among the total sample as well as women and men with EDs were higher than those reported by Inniss et al. (52). These authors noted that the rates of PTSD in their Canadian sample generally tend to be lower than those reported in the U.S. population. In the current study, the forms of subthreshold and partial PTSD most common among women and men with EDs were those that lowered the threshold for Criterion C or eliminated this criterion. This is not surprising, considering concerns that the requirement of three Criterion C (avoidance/numbing) symptoms is too stringent. Indeed, as of this writing, the proposed criteria for *DSM-5* include a threshold of one symptom for this cluster (see <http://www.dsm5.org/ProposedRevisions/Pages/proposedrevision.aspx?rid=165>).

Although this study has several strengths, some limitations should be noted. First, because of the structure of the questionnaire, age at the time of first trauma was not assessed. For those participants who experienced multiple traumas, it is possible that an early trauma was not evaluated, as PTSD symptoms were only assessed for the exposures participants self-identified as their worst, and one chosen at random by the interviewer. In addition, it was not possible to accurately compare ages of onset of trauma/PTSD and disordered eating, as the true age of onset for trauma was unknown. Lastly, there may be important differences between individuals with chronic trauma exposure and chronic PTSD, relative to those with single traumas or lifetime PTSD diagnoses, which were not captured in the current study. Thus, more research is needed to investigate the temporal relation of PTSD and EDs among women as well as men.

Assessment of PTSD was further limited by the use of skip-outs. Participants who did not report at least one symptom for a given PTSD criterion skipped subsequent questions regarding other criteria. Thus, investigation of partial PTSD was somewhat limited in the current study. Despite this caveat, however, the pattern of results was similar for partial and subthreshold PTSD, suggesting that lowering the threshold for Criterion C (or dropping this criterion, for partial PTSD), resulted in increased rates of PTSD among individuals with EDs.

Assessment of EDs was limited by the compound nature of the questions, as previously described by Hudson et al. (46). Specifically, frequency and duration were built into the questions assessing whether participants had ever binged or used compensatory behaviors, rather than being asked separately. Therefore, assessment of *DSM-IV* BED was not entirely possible in this study. This module also used skip-outs, which were especially stringent for the BN/BED section, as participants who had never binged at least twice per week for several months or longer skipped to the next section.

In sum, men as well as women with trauma and PTSD have higher rates of EDs than the general population. Thus, although the absolute number of men with EDs remains small, affected individuals have high rates of comorbidity that are comparable to those observed in female samples. Future research should continue to include both men and women and investigate interactions among psychosocial, biological, and genetic factors which increase the risk for comorbid PTSD and EDs.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Prevalence and concordance of eating disorders and PTSD diagnoses in women and men.

ED (%) [*]	PTSD diagnosis	Women					Men				
		%	% within ED	% within PTSD	χ^2 (df)	P-value	ED (%) [*]	PTSD %	% within ED	% within PTSD	P-value
BN (1.5)	PTSD	9.71	39.81	3.21	38.89 (1)	<0.001	BN (0.5)	3.59	66.19	4.36	61.11 (1)
	PTSD Sub C	11.52	47.29	3.22	47.52 (1)	<0.001		4.88	66.19	3.20	42.99 (1)
	PTSD Sub D	10.00	39.81	3.12	37.18 (1)	<0.001		3.82	66.19	4.09	56.96 (1)
	PTSD BDEF	10.02	39.81	3.11	37.09 (1)	<0.001		3.84	66.19	4.07	56.63 (1)
	PTSD BDEF	11.58	47.29	3.20	47.12 (1)	<0.001		4.93	66.19	3.17	42.48 (1)
	PTSD CDEF	9.79	39.81	3.18	38.41 (1)	<0.001		3.63	66.19	4.31	60.39 (1)
BED (3.5)	PTSD		25.74	4.40	17.58 (1)	<0.001	BED (2.0)		24.02	6.66	19.87 (1)
	PTSD Sub C		27.64	3.98	15.49 (1)	<0.001			25.68	5.23	15.88 (1)
	PTSD Sub D		25.74	4.27	16.51 (1)	<0.001			24.02	6.26	18.26 (1)
	PTSD BDEF		25.74	4.26	16.46 (1)	<0.001			24.02	6.22	18.14 (1)
	PTSD BDEF		27.64	3.96	15.28 (1)	<0.001			25.68	5.18	15.65 (1)
	PTSD CDEF		25.74	4.36	17.28 (1)	<0.001			24.02	6.59	19.59 (1)
AN (0.9)	PTSD		16.09	0.71	0.87 (1)	<0.36	AN (0.3)		0	0	--
	PTSD Sub C		18.96	0.70	1.01 (1)	<0.32			0	0	--
	PTSD Sub D		16.09	0.68	0.77 (1)	<0.39			35.99	0.88	8.17 (1)
	PTSD BDEF		16.09	0.68	0.76 (1)	<0.39			35.99	0.87	8.11 (1)
	PTSD BDEF		18.96	0.70	0.99 (1)	<0.33			0	0	--
	PTSD CDEF		16.09	0.70	0.84 (1)	<0.36			0	0	--

Note: See Supplementary Table 3 for additional results. ED=eating disorder; BN=bulimia nervosa; BED=binge eating disorder; AN=anorexia nervosa; PTSD=posttraumatic stress disorder; PTSD Sub C=subthreshold form of PTSD in which at least one symptom is endorsed for cluster C; PTSD Sub D=subthreshold form of PTSD in which at least one symptom is endorsed for cluster D; PTSD BDEF=partial form of PTSD in which Cluster D symptoms may be absent; PTSD BDEF=partial form of PTSD in which Cluster C symptoms may be absent; PTSD CDEF=partial form of PTSD in which Cluster B symptoms may be absent; χ^2 =chi-square; df=degrees of freedom.

* Prevalences originally reported by Hudson et al. (46)

Chi-square and p-values are not available for analyses with empty cells.

Table 2

Types of trauma by eating disorder status in women and men.

Trauma	% women	% women non-ED	% women with BN	X ²	Df	p-value	%women with BED	X ²	Df	p-value	%women with AN	X ²	Df	p-value
Combat	0.14	0.14	0	--	--	--	0	--	--	--	0	--	--	--
Peacekeeper	0.19	0.19	0	--	--	--	0	--	--	--	0	--	--	--
Civilian	2.00	2.01	4.43	1.83	1	<0.18	0.82	0.84	1	<0.36	2.87	0.12	1	<0.73
Terror	2.23	2.14	3.86	0.65	1	<0.42	7.32	7.59	1	<0.01	0	--	--	--
Refugee	0.85	0.84	1.43	0.257	1	<0.61	1.65	0.83	1	<0.37	0	--	--	--
Kidnapped	1.90	1.80	5.27	3.30	1	<0.07	3.48	1.09	1	<0.30	13.01	5.61	1	<0.02
Toxin	2.96	2.92	1.43	0.54	1	<0.47	6.49	2.91	1	<0.09	0	--	--	--
Auto	15.34	14.96	35.11*	10.92	1	<0.002	30.56*	8.29	1	<0.01	12.19	0.11	1	<0.74
Other accident	5.52	5.45	8.62	0.46	1	<0.50	10.21	2.07	1	<0.16	2.90	0.40	1	<0.53
Natural disaster	14.92	14.72	27.58	4.45	1	<0.04	26.14	4.13	1	<0.05	15.21	0.00	1	<0.96
Man-made disaster	5.52	5.38	6.92	0.28	1	<0.60	11.57	3.74	1	<0.06	17.16	4.67	1	<0.04
Illness	15.07	15.01	12.70	0.14	1	<0.72	24.51	3.88	1	<0.05	6.02	1.01	1	<0.32
Parents beat	6.84	6.60	21.40*	13.27	1	<0.001	18.59*	13.71	1	<0.001	8.98	0.25	1	<0.62
Partner beat	13.29	12.94	33.20*	12.29	1	<0.001	24.86*	7.48	1	<0.007	21.82	0.76	1	<0.39
Other beat	2.45	2.26	9.71*	7.59	1	<0.01	7.16*	8.06	1	<0.005	13.01	4.11	1	<0.05
Mugged	11.99	11.83	19.45	2.49	1	<0.12	16.75	1.28	1	<0.26	24.97	1.83	1	<0.18
Raped	14.65	14.45	40.94*	20.41	1	<0.001	19.51	1.48	1	<0.23	32.76	3.25	1	<0.08
Other sexual assault	18.65	18.24	39.28*	10.97	1	<0.001	34.78*	8.42	1	<0.004	48.11	6.09	1	<0.02
Stalked	13.41	12.89	35.71*	17.87	1	<0.001	33.88*	22.00	1	<0.001	28.31	2.51	1	<0.12
Unexpected death	42.82	42.66	55.58	2.52	1	<0.12	55.00	3.33	1	<0.07	35.42	0.30	1	<0.59
Child	13.94	13.84	15.98	0.11	1	<0.74	18.52	0.96	1	<0.33	27.18	0.96	1	<0.33
Vicious	9.73	9.43	37.45*	32.46	1	<0.001	18.26	5.20	1	<0.03	12.28	0.24	1	<0.63
Witnessed fights	15.61	15.20	45.80*	25.60	1	<0.001	30.83*	8.35	1	<0.004	29.05	1.75	1	<0.19
Witnessed injury	19.06	18.91	37.05*	8.04	1	<0.005	27.45	2.03	1	<0.16	5.77	3.40	1	<0.07

Trauma	% women	% women non-ED	% women with BN	X ²	Df	p-value	% women with BED	X ²	Df	p-value	% women with AN	X ²	Df	p-value
Accidentally harm	0.71	0.70	0	--	--	--	1.90	2.02	1	<0.16	0	--	--	--
Purposefully harm	0.36	0.30	4.73*	13.14	1	<0.001	1.89	4.12	1	<0.05	0	--	--	--
Atrocities	1.64	1.64	3.93	2.20	1	<0.14	0.82	0.49	1	<0.48	0	--	--	--
Any trauma	79.44	79.05	100	--	--	--	90.33	--	--	--	100	--	--	--
Any IPT	46.22	45.61	78.21	--	--	--	63.67	--	--	--	71.16	--	--	--
Men														
Trauma	% men	% men non-ED	% men with BN	X ²	Df	p-value	% men with BED	X ²	Df	p-value	% men with AN	X ²	Df	p-value
Combat	10.20	10.17	56.55*	9.43	1	<0.003	17.88	0.82	1	<0.37	0	--	--	--
Peacekeeper	2.80	2.80	6.64	0.64	1	<0.43	3.85	0.18	1	<0.67	0	--	--	--
Civilian	2.28	2.31	0	--	--	--	0	--	--	--	0	--	--	--
Terror	2.56	2.51	22.41*	9.42	1	<0.003	2.29	0.01	1	<0.93	31.84*	10.59	1	<0.002
Refugee	0.81	0.83	0	--	--	--	0	--	--	--	0	--	--	--
Kidnapped	0.84	0.83	9.64	7.64	1	<0.006	2.29	1.04	1	<0.31	0	--	--	--
Toxin	11.65	11.50	74.60*	23.65	1	<0.001	35.36*	9.47	1	<0.003	0	--	--	--
Auto	23.43	23.22	66.19	5.26	1	<0.03	50.00*	7.78	1	<0.006	0	--	--	--
Other accident	14.28	14.32	17.51	0.06	1	<0.81	13.76	0.01	1	<0.95	0	--	--	--
Natural disaster	20.15	19.93	57.79	3.73	1	<0.06	43.02	5.77	1	<0.02	67.83	4.36	1	<0.04
Man-made disaster	8.00	7.83	0	--	--	--	28.37*	10.02	1	<0.002	0	--	--	--
Illness	17.02	16.90	59.55	5.64	1	<0.02	34.60	3.79	1	<0.06	31.84	0.49	1	<0.49
Parents beat	6.27	5.99	16.27	1.48	1	<0.23	34.35*	26.69	1	<0.001	32.17	3.68	1	<0.06
Partner beat	1.53	1.38	59.55*	107.03	1	<0.001	14.14*	12.06	1	<0.001	35.99*	24.49	1	<0.001
Other	12.37	12.30	16.27	0.12	1	<0.74	22.64	2.15	1	<0.15	32.17	1.11	1	<0.30
Mugged	25.81	25.46	80.59*	10.51	1	<0.002	64.45*	18.53	1	<0.001	32.17	0.07	1	<0.79
Raped	2.27	2.15	18.04*	8.51	1	<0.004	12.94*	16.26	1	<0.001	0	--	--	--
Other sexual assault	4.90	4.74	23.53	4.24	1	<0.04	16.12	5.59	1	<0.02	68.16*	26.92	1	<0.001
Stalked	5.11	4.93	59.55*	27.46	1	<0.001	22.75*	9.68	1	<0.002	35.99	5.90	1	<0.02

Trauma	% women	% women non-ED	% women with BN	X ²	Df	p-value	%women with BED	X ²	Df	p-value	%women with AN	X ²	Df	p-value
Unexpected death	40.70	40.52	86.83*	8.48	1	<0.004	76.03*	13.25	1	<0.001	67.83	0.94	1	<0.34
Child	8.65	8.69	14.39	0.35	1	<0.56	4.56	0.88	1	<0.35	32.17	2.10	1	<0.15
Vicarious	9.49	9.24	59.55*	13.16	1	<0.001	38.79*	18.87	1	<0.001	0	--	--	--
Witnessed fights	12.87	12.66	92.13*	58.43	1	<0.001	35.32	7.62	1	<0.006	0	--	--	--
Witnessed injury	38.42	38.27	93.36*	15.52	1	<0.001	67.85*	9.15	1	<0.003	32.17	0.05	1	<0.83
Accidentally harm	2.22	2.11	64.31*	92.28	1	<0.001	14.14*	7.25	1	<0.008	0	--	--	--
Purposefully harm	3.68	3.43	64.31*	53.47	1	<0.001	29.40*	29.01	1	<0.001	0	--	--	--
Atrocities	9.90	9.95	14.39	0.19	1	<0.67	8.62	0.06	1	<0.82	0	--	--	--
Any trauma	84.05	83.88	100	--	--	--	98.40	--	--	--	100	--	--	--
Any IPT	42.11	41.71	100	--	--	--	74.34	--	--	--	68.16	--	--	--

Note: PTSD=posttraumatic stress disorder; BN=bulimia nervosa; BED=binge eating disorder; AN=anorexia nervosa; χ^2 =chi-square; df=degrees of freedom; combat=been in combat, peacekeeper=served as a peacekeeper or relief worker in a place such as a war zone, civilian=been an unarmed civilian in a place of war/revolution, terror=been a civilian in a place where there was ongoing terror of civilians, refugee=been a refugee, kidnapped=been kidnapped or held captive, toxic=been exposed to a toxic chemical or substance, auto=been involved in a life-threatening automobile accident, other accident=been involved in any other life-threatening accident, natural disaster=been involved in a major natural disaster, man-made disaster=been involved in a man-made disaster, illness=had a life-threatening illness, parents=beaten by parents/guardians as a child, partner=beaten by a spouse or romantic partner, other=beaten by anyone else, mugged=mugged or threatened with a weapon, raped=been raped, other sexual assault=experienced sexual assault other than rape, stalked=been stalked, unexpected death=had someone close die unexpectedly, child=had a child with a life-threatening illness/injury, vicarious= had anyone close experience extreme trauma, witnessed fights=witnessed serious physical fights at home as a child, witnessed injury=witnessed someone experience bodily injury or death or unexpectedly see a dead body, accidentally harm=did something accidentally that led to injury/death of someone else, purposefully harm=purposefully injured/tortured/killed someone else, atrocities=see atrocities or carnage. Interpersonal traumas=been kidnapped or held captive, beaten by parents/guardians as a child, beaten by a spouse or romantic partner, beaten by anyone else, mugged or threatened with a weapon, been raped, experienced sexual assault other than rape, been stalked, or witnessed serious physical fights at home as a child; IPT=interpersonal trauma. Chi-square and p-values are not reported for analyses with empty cells.

* denotes significance at $p<.01$.