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Eating Disorders, Trauma, PTSD and Psychosocial Resources

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Abstract

The frequency of traumatic events and comorbid post-traumatic stress disorder (PTSD) in women with eating disorders (EDs) was assessed. Also, patients with anorexia nervosa (AN) and bulimia nervosa (BN) were compared with regard to post-traumatic symptomatology and the role of psychosocial resources was analyzed. 103 ED patients (29.1±10.5 years) were studied through the use of standardized questionnaires. 23.1% of AN and 25.5% of BN patients fulfilled the study definition for a current diagnosis of PTSD. Cumulative traumatization led to more severe symptomatology. Psychosocial resources were found to have strong associations with symptomatology. These findings provide additional support for the association between traumatization and ED. Clinical interventions for traumatized ED patients may benefit from a focus on post-traumatic stress symptomatology and personal resources.

Many studies have documented trauma history in patients with eating disorders (ED) (Dalle Grave, Rigmonti, Todisco & Oliosi, 1996; Reyes-Rodriguez et al., 2011), with childhood sexual abuse (CSA) being the most well-documented trauma in these patients (De Groot & Rodin, 1999; Wonderlich et al., 2001). Brewerton (2007) summarizes that CSA is a significant, although non-specific, risk factor for ED. Also, several studies demonstrate that sexually assaulted women are more likely to report an ED and poor mental health than women who had not been sexually assaulted (Faravelli, Giugni, Salvatori & Ricca, 2004; Tagay, Schlegl & Senf, 2010). Other types of trauma reported in ED patients include physical and emotional abuse (Kent, Waller & Dagnan, 1999; Rorty, Yager & Rossotto, 1994), teasing and bullying (Matteo & Espelage, 2002), and parental break-up and loss of a family member (Dalle Grave, Rigmonti, Todisco & Oliosi, 1996; Mahon, Bradeley, Harvey, Winston & Paler, 2001). Specifically, trauma is more common in bulimia nervosa (BN)

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compared to non-BN patients (Smolak & Murnen, 2002; Striegel-Moore, Dohm, Pike, Wilfley & Fairburn, 2002). For example, Mitchell, Mazzeo, Schlesinger, Brewerton & Smith (2012) found higher rates of various types of traumas among male and female patients with BN or binge eating disorders (BED) compared with the general population, especially with respect to interpersonal traumas.

The prevalence of traumatic events in ED patients has ranged from 37% to 100% (Dalle Grave et al., 1996; Mitchell et al., 2012). On the other hand, studies exploring the full diagnosis of post-traumatic stress disorder (PTSD) in ED samples have found a prevalence range from 4% to 52% (Gleaves, Eberenz & May, 1998; Reyes-Rodriguez et al., 2011). Despite the literature in this area, there are some limitations regarding the precision and accuracy of trauma data collection and classification. Most of the studies have focused exclusively on specific trauma domains, such as interpersonal post-traumatic events, and, therefore, contribute to the underreporting of other types of traumas in this population.

PTSD has a negative impact on personal resources such as social interactions and one's sense of coherence (SOC) (Davidson, Hughes, Blazer & George, 1991; Tagay, Mewes, Brähler & Senf, 2009). According to the paradigm of salutogenesis (Antonovsky, 1987), SOC explains why humans in stressful situations stay well and are even able to improve their physical, mental and social well-being. Moreover, empirical evidence shows a strong association between SOC and mental health. Some studies reveal negative relationships of SOC with anxiety, depression and trauma-related disorders (Eriksson & Lindström, 2007). The relationship between SOC and PTSD symptoms has been demonstrated in numerous studies that examined people's reactions after traumatic events. It has been revealed that SOC seems to be predictive for the probability of developing post-traumatic stress symptoms after a traumatic event (Jonsson, Segesten & Mattson, 2003; Dudek & Koniarek, 2000).

Another important factor in PTSD is social support. Guay, Beaulieu-Prevost, Beaudoin and St-Jean-Trudel (2011) found a direct association between social support and PTSD. In a meta-analysis of risk factors for PTSD, Brewin, Andrews and Valentine (2000) found lack of social support to be one of the most significant predictors for PTSD. On the other hand, Kessler and McLeod (1985) found compelling evidence that social support is associated with well-being and mental health, raising the question of whether PTSD influences social support negatively and, therefore, impairs the patient's mental health.

However, the study of the association between SOC and ED has been limited. A recent study found that the presence of SOC is a strong predictor of ED symptomatology (Tagay et al., 2009). Specifically, it has been revealed that ED patients have less SOC than the normal population, thereby affecting therapy outcomes (Tagay et al., 2009; 2011). Moreover, research has shown that ED patients receive less social support and are more dissatisfied with it than the normal population (Rorty, Yager, Buckwalter & Rossotto, 1999; Tiller, Sloane, Schmidt & Troop, 1997). These studies provide a first insight into the associations between PTSD, psychosocial resources and ED; however, more research exploring the underlying mechanisms is needed.

The main purpose of the current study was to explore trauma (frequency and intensity) and PTSD in a sample of ED patients using an extensive list of various traumatic events. Based on the assessment procedure used, we expected higher trauma prevalence compared with previous studies, but similar prevalence of PTSD. There is evidence of an association among multiple episodes or forms of trauma, ED and the level of post-traumatic symptoms (Brewerton, 2007; Follette, Polusny, Bechtle & Naugle, 1996; Tagay et al., 2010,). Therefore, we hypothesized that multiple traumatic events are associated with a more severe

level of ED and PTSD symptomatology. As a secondary aim, potential predictors of ED and PTSD symptoms were explored. We hypothesized that SOC and social support would have a high predictable value on ED and PTSD.

METHODS

Participants

The study sample consisted of 107 female patients with ED. The majority of recruited participants (n = 91) were from an inpatient clinic (Department of Psychosomatic Medicine and Psychotherapy, University of Duisburg-Essen). In addition, 16 outpatients were recruited from different private practices. Patients were 18 years or older and with a primary diagnosis of ED (AN or BN). The psychiatric diagnoses were initially determined according to the International Classification of Disease (ICD-10; WHO, 1993). Four patients were excluded due to missing data. Of the total sample, fifty-two patients met criteria for AN and fifty-one met the criteria for BN. Informed consent was obtained from all participants and the study was approved by the University Research Ethic Committee.

Measures

Essen Trauma-Inventory (ETI)—The ETI is a self-rating questionnaire developed to assess potentially traumatic events (PTEs) and related to post-traumatic symptomatology according to DSM-IV-TR diagnostic criteria (Tagay et al., 2007). The scale consists of four subscales including Intrusion, Avoidance, Hyperarousal and Dissociation, covering the criteria for Acute Stress Disorder (ASD) and PTSD. The intensity of PTSD symptomatology is analyzed using the following cut-off scores: not clinical (0–15 points), discrete (16–26 points) and clinically apparent (≥27 points). The total ETI score is calculated by summing up the item-scores of each section. The inventory also assesses the number and severity of physical complaints and current symptoms related to impairment in different areas of daily life. Statistical and psychometric properties were found to be excellent (Tagay et al., 2007; Tagay, Repic & Senf, 2013). In the current study, Cronbach's alpha was 0.90.

Eating Disorders Inventory (EDI-2)—The EDI-2 is a 91-item self-report questionnaire that assesses ED symptoms, behaviors and attitudes (Garner, 1991). This inventory contains 11 subscales: Drive for Thinness (DT), Bulimia (B), Body Dissatisfaction (BD), Ineffectiveness (I), Perfectionism (P), Interpersonal Distrust (D), Maturity Fears (MF) Interoceptive Awareness (IA), Asceticism (A), Impulse Regulation (IR), and Social Insecurity (SI). The last three subscales were excluded from the analyses, because they were not relevant to the study's aims. Higher scores on the scales reflect higher levels of psychopathology. In the current sample, the internal consistency estimates of the scales were between α=.74 (Perfectionism) and α=.92 (Ineffectiveness). Cronbach's alpha for the EDI-total scale was α=.95.

Sense of Coherence (SOC-13)—The SOC-13 is the short version of Antonovsky's Sense of Coherence Scale (SOC-29; Antonovsky, 1993). Sense of coherence is considered a personal resource and explains why some humans in stressful situations stay well and are sometimes even able to improve their physical, mental and social well-being (Tagay, 2013). The SOC-13 questionnaire consists of 13 items using a 7-point Likert-type scale. The total possible score can range from 13 to 91, in which higher scores reflect a better SOC. The SOC-13 is a commonly used and well-studied instrument with good statistical and psychometric properties (Antonovsky, 1993). In the present study the scale was found to have high internal consistency (α=.84).

Social Support Questionnaire (SSQ)—The Social Support Questionnaire measures perceived and anticipated social support (Sommer & Fydrich, 1989). In its regular version, the questionnaire consists of 54 items making up 8 scales. The current study used the 22-item short version to explore social support related to ED and trauma (Sommer & Fydrich, 1989). In this sample, the internal consistency was α=.93.

Data analysis

In order to test the hypotheses we used χ^2-analyses, paired sample and independent-sample t-tests, analyses of variances (ANOVA) and multiple linear regression analyses. To evaluate predictors of ED and PTSD, multiple stepwise regression analyses were conducted using the ED and PTSD symptomatology as dependent variables. Demographic (age, education level), service utilization and duration of ED, nature of trauma (sexual assault, nonsexual assault, non-manmade trauma, number of traumas, A2-criterium, current perceived stress due to the trauma, time since worst event), and resources (sense of coherence, social support) were tested as independent variables. For all statistics analyses, *p* values of. 05 or lower were considered statistically significant in a two-tailed test.

RESULTS

Patient characteristics

Demographic and clinical data is presented in Table 1. The mean age of the total sample was 29.11 years (*SD* =10.53) with a range from 18 to 68 years. Both BN and AN groups did not differ with regards to marital status ($\chi^2(2, n = 100) = 4.23$, $p = .24$), education ($\chi^2(3, n = 102) = 2.40$, $p = .49$) and employment status ($\chi^2(5, n = 86) = 5.62$, $p = .35$). However, with regard to clinical characteristics there was a significant difference in their body-mass-index (BMI) ($t(88) = -5.37$, $p \leq .001$). As expected, patients with AN had a significantly lower BMI than patients with BN.

Potentially traumatic events (PTEs)

Overall, 95.1% ($n = 97$) of the patients had experienced at least one PTE in their lives. The highest number of reported traumatic events was eleven and on average, they had experienced around 3.8 (± 2.52) PTEs. The most commonly experienced traumas in both groups were life threatening illness, death of a close person or family member, and sexual assault by a stranger or family member (Table 2). Patients with AN mostly identified death of a close person as the worst event and for BN group the most impacting traumas were life threatening illness and death of a close person. The events considered most traumatic mainly belonged to the field of interpersonal traumatization. AN and BN did not differ with regard to the prevalence of the number of traumas and particular trauma types.

To compare the source of the trauma (non-manmade vs. manmade), the reported traumas from the ETI were divided in two groups: non-manmade trauma, including items 1–3, and manmade trauma, involving items 4–14, whereas “death of a close person” was excluded from analyses *“Death of a close person” is often named as a traumatic event. Nevertheless, it is difficult to clearly classify this sort of trauma in a category (non-manmade or manmade), because there are many different ways on how someone can lose a close person (i.e. the person dies of illness or has been killed). To avoid any confounding we decided to exclude this trauma from the categories.* The results show that experiencing a manmade trauma led to more severe post-traumatic symptoms. The groups differed significantly for Intrusion ($t(91) = 3.42$; $p \leq .001$), Avoidance ($t(87) = 3.30$; $p \leq .001$) and Hyperarousal ($t(85) = 2.54$; $p = .013$). The means for manmade traumas were higher than those for non-manmade traumas (data not shown).

Trauma prevalence and PTSD

There was no significant difference between AN and BN patients with regard to the lifetime prevalence of trauma (χ^2 (*1*, *n* = *102*) = 1.89, *p* = .17) (Table 3). In both groups, the conditions for the A2-criterion (subjective emotional response) were met more often than those for the A1- criterion (stressor). Both groups reported an event that involves actual or threatened death or serious injury of oneself more often than of others. There was no group difference in reported feelings of helplessness and intense fear of horror. The PTSD prevalence for the total sample was 24.3%, of which 23.1% of AN patients and 25.5% of BN patients met the DSM-IV criteria for PTSD. The majority of patients (67.7%) with PTSD reported the first traumatic event before the onset of ED (χ^2(1, *n* = 21) = 17.38, *p* ≤ = .001). Similar results were found in both groups regarding the onset of ED after the first traumatic event (AN: 72.2%; χ^2(1, *n* = 40) = 11.80, *p* ≤ .001 and BN: 61.5%, χ^2(1, *n* = 39) = 5.57, *p* = .018). In order to examine the effect of multiple traumatizations on the symptomatology, participants were split into 5 groups according to the number of experienced PTEs ranging from “1” to “5 and more”. It was found that all aspects of the trauma-related symptoms (Intrusion, Avoidance, Hyperarousal, and Dissociation) increase with the number of experienced PTEs (data not shown).

PTSD symptomatology and ED

To analyze the relation between ED and PTSD symptomatology, the AN and BN samples were each divided into three groups depending on their ETI score reflecting the severity of their PTSD symptomatology: not clinical (0–15 points), discrete (16–26 points), clinically apparent (≥27 points). These groups were compared with a control group mentioned in the EDI-2 Manual (Paul & Thiel, 2005) which consisted of 186 healthy females. This sample had a mean age of 28 years (*SD* =6.0) and their average BMI was 22.0 (*SD* =2.6). The mean scores of EDI-2 increased constantly with the level of severity of trauma symptoms in both AN and BN (Table 4). Furthermore, the mean scores of the lowest symptom level of PTSD or non-clinical symptoms group were highest when compared to the norm group. Comparing the clinical level symptoms group with the non-clinical symptoms group we found significant differences on each EDI-2 scale. Significant differences between the severity levels on almost all scales with predominantly high effect sizes were revealed. These results indicate that patients with higher PTSD symptomatology also suffer from more severe ED symptoms. The highest scores in both groups (AN and BN) were in Body Dissatisfaction and Ineffectiveness scales.

The role of sense of coherence and social support

Whereas the PTSD symptomatology increases with the number of PTEs, SOC correlated negatively with the number of PTEs. The more traumatic events a patient experienced, the lower their SOC (*r*=−.236, *p* = 0.02). Also for social support and number of PTE a negative correlation was observed, though it was small and not significant (*r*=−.147, *p* = .14). We divided the sample into three groups according to their level of traumatization: no trauma (no trauma event reported), trauma without PTSD (at least one trauma experienced but not meeting the criteria for PTSD) and PTSD (at least one lifetime trauma and meeting all criteria for PTSD). Figure 1 illustrates that in our sample SOC and social support decrease with the level of traumatization. The differences of the mean scores among groups were found to be significant for SOC (*F*(2, 93)=12.36, *p*≤.001) and social support (*F*(2, 98)=3.49, *p* = .03).

Additionally, the EDI-2 Ineffectiveness sub-scale was included within this analysis. This sub-scale stands for self-esteem and self-efficacy as well as feelings of control over one’s own life which are also personal resources and therefore able to improve one’s well-being

and treatment outcome. Results show an increase of ineffectiveness with the level of traumatization.

Predictors of ED and PTSD Symptomatology

Two stepwise multiple regression analyses for each subgroup (AN and BN) were used to explore potential predictors of ED and PTSD symptomatology. As Table 5 shows, SOC was found to be the only predictor for ED symptomatology in the AN group explaining 34.9% of the variance. In the BN group, SOC predicted a considerable portion of 60.5% of ED symptomatology. The results for PTSD symptomatology show that for AN and BN, SOC and the number of traumatic events were significant predictors. Whereas in the AN group social support has been revealed as a significant predictor, in BN the SOC declares 29.9% of the variance. Thus, the results support the hypothesis that low levels of personal coping resources are related to high ED- and PTSD symptomatology.

DISCUSSION

The purpose of the present study was to estimate the lifetime prevalence of traumatic events and PTSD in female patients with ED, to analyze post-traumatic symptoms by ED sub-groups (AN and BN), and to explore the role of sense of coherence and social support in patients with ED who experienced PTEs. Also, we explored relevant predictors for PTSD- and ED symptomatology. To the best of our knowledge the current study is the first that investigates the relationships between ED, trauma and psychosocial resources.

The frequency of PTEs was 92.2% in the AN group and 98.0% in the BN group. This prevalence is high but comparable with other studies (Dalle Grave et al., 1996; Mitchell et el., 2012). The trauma assessment procedure used in the current study could explain this high prevalence. As mentioned in the methods section, the ETI includes an extensive list of traumas that cover a wide range of PTEs. This comprehensive approach is in contrast to the methodology of other studies that usually concentrate on a small number of PTEs only, which results in underreported cases. As part of the comprehensive approach, it would be important not only to document the presence of PTEs, but also to explore how the person has internalized the events and whether or not they qualify them as traumatic.

There were no significant differences regarding the type or number of traumatic events by ED sub-groups and neither in the intensity of post-traumatic symptomatology. In contrast with other studies, sexual assault was not the most reported trauma in this sample. However, comparing interpersonal with non-interpersonal traumas, the former was more commonly reported, which is consistent with previous studies (Reyes-Rodriguez, et al., 2011). Moreover, interpersonal traumas led to significantly more severe post-traumatic symptoms (Tagay et al., 2010).

Based on the DSM-IV criteria, the prevalence of PTSD were 23.1% (AN) and 25.6% (BN). This is consistent with other findings. In the National Women's Study (Dansky, Brewerton & O'Neil, 1997), the lifetime prevalence of PTSD was 37% in patients with BN as compared to 12% in non-ED patients. As documented in several studies, EDs and anxiety disorders frequently co-occur (Swinbourne & Touyz, 2007; Kaye, Bulik, Thornton, Barbarich & Masters, 2004). However, our prevalence results are lower compared with clinical studies conducted in the U.S. which used tertiary referred patients. These studies found a prevalence of 43% in both inpatient and outpatient samples (Mueser et al., 1998; Zimmerman & Mattia, 1999). Differences in criteria and methodology system used to assess PTSD and where these patients came from (clinical vs community) could explain some of these variances (Reyes-Rodriguez et al., 2011).

Consistent with previous research, the re-traumatization is associated with severe post-traumatic symptomatology and, furthermore could increase the vulnerability for the onset of PTSD (Follette et al., 1996; Green et al., 2000). Moreover, not only is the re-experiencing of multiple traumas a powerful predictor for PTSD, but also the nature of trauma, specifically those which are interpersonal, increases the risk for later psychopathology (Green et al., 2000).

The results also show that a high PTSD symptomatology is associated with more severe ED symptoms. Furthermore, there are numerous studies suggesting that comorbid anxiety disorders may be one indicator for poor therapy outcome in ED (Fichter & Quadflieg, 2004). Rodríguez, Pérez and García (2005) and Mahon et al. (2001) have demonstrated that ED patients, who have experienced traumatic events, more often drop out from treatment, demonstrate poorer outcomes and have higher relapse rates than non-traumatized patients. Therefore, careful clinical diagnostics are essential to provide the right treatment and to ensure a positive therapy outcome. This leads to a clinical implication, especially for therapies of chronic eating disorders, where ED-specialized therapeutic interventions show no effect: in the end it is possible that a comorbid PTSD must be treated in order to affect the ED-symptomatology. Thus, the results of our study emphasize the importance of tailored interventions in which the trauma and PTSD pieces are considered in the diagnostic and therapeutic process for ED patients. A standard procedure in clinical practices could have the benefit of preventing the experience of re-traumatization or avoiding the increase of further psychopathologies.

As mentioned previously, the research on sense of coherence and social support in ED and PTSD is scarce. Our results demonstrate that with increasing experiences of trauma the personal resources decrease. As hypothesized, we found that ED patients with PTSD have the lowest SOC and social support compared to patients with no PTSD. Moreover, the feeling of ineffectiveness was highest in the PTSD group revealing that also self-efficacy and self-esteem are lower in those patients, as well as the feeling of control over their own life. Our results are in line with studies conducted by Davidson et al. (1991) and Frommberger et al. (1999) who suggest an association of PTSD with negative influence on personal resources. Also it underlines previous findings of negative relationships of SOC with trauma-related disorders (Eriksson & Lindström, 2007). On the other hand SOC was the main predictor for ED-symptomatology in AN and BN patients. The lower the SOC was, the higher the severity of eating disorder symptoms. However, it is important to mention that the correlations found do not imply causal relationships between those measures. Nevertheless, the results indicate that individuals with ED and history of traumatic events may benefit from a psychotherapy focused on the reinforcement of personal resources, especially one’s sense of coherence and social support. On a practical level, the involvement of relatives or friends of ED patients in treatment, as well as special therapeutic interventions to strengthen one’s SOC and self-efficacy could enhance treatment outcomes. Furthermore, we found sexual assault to be a significant predictor for ED symptomatology in BN but not in AN. This is in line with other findings in the literature, where sexual assault was found to be more common in bulimia compared to non-bulimia type ED patients. For PTSD-symptoms, sexual assault could not be identified as a relevant predictor (Faravelli et al., 2004; Klump, 2006). Thus, the type of trauma seems to have no influence on the severity of PTSD symptoms. Yet, in correspondence with the literature, the number of traumatic events predicted post-traumatic symptomatology in both AN and BN, which supports the dose-response relationship.

Several limitations of the study have to be mentioned. First, the study does not allow causal interpretations because of its retrospective and cross-sectional nature. Therefore, even if most patients state that their trauma happened before the onset of their ED, the data do not

allow us to consider that PTSD causes ED. This lack of knowledge about the temporal relationship between trauma and onset of ED makes it difficult to interpret conclusions regarding sense of coherence and social support. It is also possible, that active ED symptoms mask symptoms of PTSD. Further studies, especially longitudinal investigations, are needed to address the issue of causality between traumatization and ED. Second, the sample of AN patients was not broken down into restricting and binge-purge types and there was no control group. Third, PTSD was assessed by self-report instruments instead of using a standardized diagnostic interview. The use of standardized diagnostic interview is recommended in order to establish a full diagnosis of PTSD. Despite these limitations we are contributing with interesting data about the relation of eating disorders, trauma and protective factors like social support and sense of coherence in AN and BN. Further research directions should also include the role of personality comorbidity (especially Borderline Personality) in the relation of trauma-related disorders and eating disorders.

Conclusions and clinical implications

In summary, PTSD prevalence in ED patients is about 24.3%, confirming the comorbidity between both disorders. Interpersonal traumatization in ED patients was strongly associated with increased post-traumatic stress symptoms. The present findings support the concept that individuals who develop ED after (multiple) traumatization are likely to have experienced post-traumatic stress disorder symptomatology. Furthermore, our results suggest that PTSD in ED patients is underdiagnosed in routine clinical practice and is highly associated with low personal resources. The findings of the present study suggest that practitioners should anticipate and assess PTSD comorbidity in ED patients whom they treat (Reyes-Rodriguez, 2011; Tagay et al., 2010). Finally, clinical interventions for traumatized eating disorder individuals may benefit from a focus on personal resources such as SOC, social support and self-efficacy. The early detection of trauma experience and PTSD in ED patients and the availability of resources have the potential to improve treatment outcome.

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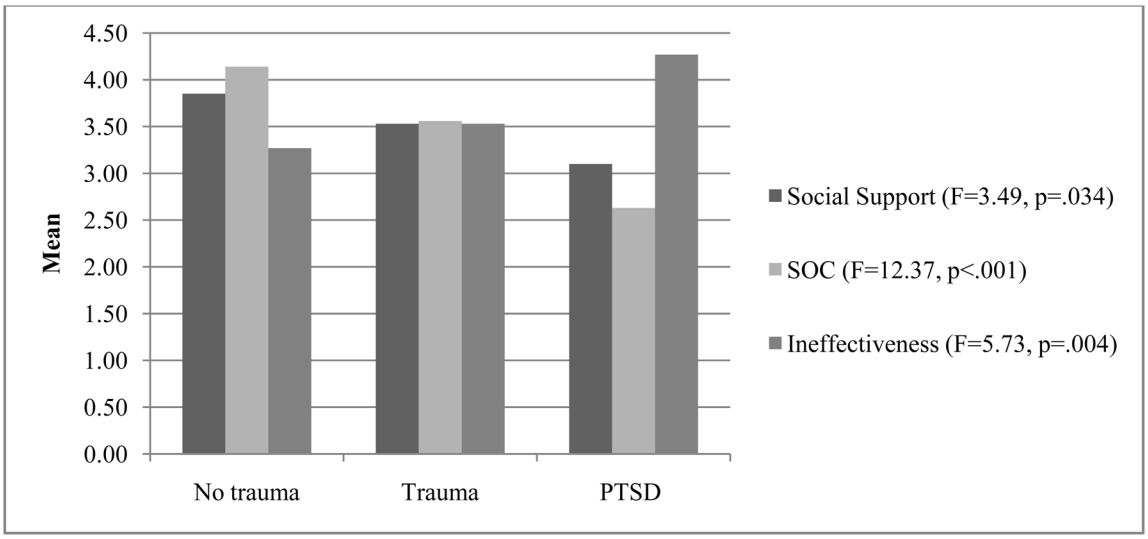

Figure 1.
Social Support (SSQ), Sense of Coherence (SOC-13), Ineffectiveness (EDI-2) and grade of traumatization in ED-patients

Table 1

ED patient demographic characteristics

	Anorexia Nervosa (N=52)	Bulimia Nervosa (N=51)	T/χ^2- value	p
Age in years			−0.74	.46
Mean (SD)	28.32 (11.67)	29.88 (9.34)		
Range	18–63	18–68		
	n (%)	**n (%)**		
Marital status			4.23	.24
Single	40 (80.0)	41 (82.0)		
Married	8 (16.0)	6 (12.0)		
Divorced	2 (4.0)	3 (6.0)		
Education			2.40	.49
No certificate	1 (2.0)	0		
Certificate of secondary education	5 (9.8)	9 (17.6)		
General certificate of secondary education	19 (37.3)	16 (31.4)		
University qualification	26 (51.0)	26 (51.0)		
Employment status			5.62	.35
Paid work (full-time)	17 (42.5)	23 (50.0)		
Unemployed	4 (10.0)	8 (17.4)		
No paid work	7 (17.5)	3 (6.5)		
Retired	0	2 (4.3)		
On sick leave	12 (30.0)	10 (21.7)		
Clinical characteristics	**Mean (SD)**	**Mean (SD)**		
Body mass index (kg/m^2)	16.95 (3.67)	21.11 (3.69)	−5.37	.001
Duration of ED (years)	9.48 (10.64)	10.19 (7.0)	−0.38	.71

Notes: ED, eating disorders; n, sample size; SD, standard deviation

Table 2

Potentially traumatic events (PTEs) in ED patients

	Anorexia nervosa				Bulimia nervosa					
Potentially traumatic event	**Experienced in person n (%)**	**Experienced as a witness n (%)**	**Considered most traumatic n (%)**	**Total n (%)**	**Experienced in person n (%)**	**Experienced as a witness n (%)**	**Considered most traumatic n (%)**	**Total n (%)**	**χ^2**	**p**
1. Natural disaster	7 (13.7)	1 (2.0)	0	8 (15.7)	9 (18.0)	0	0	9 (18.0)	0.10	.76
2. Serious accident, fire or explosion	11 (21.5)	1 (2.0)	3 (7.0)	12 (23.5)	10 (19.7)	4 (7.8)	1 (2.3)	14 (27.5)	0.21	.65
3. Life threatening illness/injury	9 (18.0)	17 (34.0)	2 (4.7)	26 (52.0)	10 (20.4)	19 (37.6)	6 (13.6)	29 (58.0)	1.53	.47
4. Assault by a stranger	8 (16.0)	2 (4.0)	3 (7.0)	10 (20.0)	15 (29.4)		1 (2.3)	15 (29.4)	2.22	.33
5. Assault by a family member or someone you know	12 (23.5)	1 (2.0)	3 (7.0)	13 (25.5)	18 (35.3)	3 (5.9)	0	21 (41.2)	2.82	.09
6. Death of a close person or family member	0	25 (49.0)	9 (20.9)	25 (49.0)	0	25 (50.0)	6 (13.6)	25 (50.0)	0.01	.92
7. Imprisonment	0	0	0	0	0	2 (4.0)	1 (2.3)	2 (4.0)	2.99	.22
8. Sexual assault by a stranger (as a child or an adult)	12 (23.5)	1 (2.0)	4 (9.3)	13 (25.5)	18 (35.6)	0	3 (6.8)	18 (35.6)	0.22	.64
9. Sexual assault by a family member or someone you know (as a child or an adult)	13 (25.5)	0	5 (11.6)	13 (25.5)	17 (33.5)	2 (4.0)	2 (4.6)	19 (37.5)	0.33	.56
10. Torture	0	0	0	0	1 (2.0)	1 (2.0)	0	2 (4.0)	2.04	.15
11. Neglect	18 (35.3)	0	1 (2.3)	18 (35.3)	11 (22.0)	3 (6.0)	2 (4.5)	14 (28.0)	1.55	.46
12. Other traumatic event	37 (72.5)	1 (2.0)	11 (25.6)	38 (74.5)	40 (78.3)	3 (6.0)	14 (31.8)	43 (84.3)	1.50	.22
Sexual assault (Items 8,9,13,14)	-	-	9 (20.9)	(33.3)	-	-	5 (11.4)	(38.0)	0.24	.62
Non-man-made trauma (Items 1, 2, 3)	-	-	5 (11.7)	(62.0)	-	-	7 (15.9)	(68.8)	0.49	.48
Nonsexual assault (Items 4,5,7,10,11,12)	-	-	7 (16.3)	(47.9)	-	-	3 (6.8)	(57.1)	0.83	.36

Table 3

Trauma- and PTSD-Prevalence in ED patients

	Anorexia Nervosa, N=52 n (%)	Bulimia Nervosa, N=51 n (%)	χ^2	p
Trauma	47 (92.2)	50 (98.0)	1.89	.17
A1 criterion	28 (68.3)	27 (61.4)	0.45	.50
Injury to self	15 (35.7)	13 (28.3)	0.56	.45
Own life in danger	14 (34.1)	15 (31.9)	0.05	.82
Injury to other	5 (11.9)	10 (21.3)	1.39	.24
Other life in danger	10 (23.8)	14 (31.1)	0.58	.45
A2 criterion	41 (95.3)	45 (97.8)	0.42	.52
Helplessness	41 (95.3)	47 (97.9)	0.47	.49
Intense Fear or Horror	35 (81.4)	41 (89.1)	1.07	.30
A criterion	23 (56.1)	22 (50.0)	0.32	.57
Suspected PTSD*	12 (23.1)	13 (25.5)	0.58	.85

Notes:

* Experienced trauma + A-criterion and Cut-off Value + time of event are met

TABLE 4

Means (M) and Standard Deviations (*SD*) in EDI-2 for AN and BN Patients Compared to Norm Group

		Anorexia nervosa								
	Norm[1]	[2] Not clinical		Discrete		Clinically apparent				
EDI-2	*M* (*SD*)	*M*	(*SD*)	*M*	(*SD*)	*M*	(*SD*)	*F*	*p*	ES
Drive for thinness	17.3 (6.8)***	18.57	13.30	26.50	10.59	30.35	11.21	2.88	.07	0.14
Bulimia	10.6 (3.4)***	10.71	4.31	13.10	4.51	16.43	9.12	1.78	.180	0.09
Body dissatisfaction	30.2 (10.3)***	30.29	6.63	32.00	10.07	40.09	9.54	4.46	.018	0.20
Ineffectiveness	23.5 (5.7)***	31.43	8.62	35.90	11.05	40.78	8.52	3.08	.058	0.14
Perfectionism	16.5 (5.7)***	16.71	6.82	20.50	4.38	24.49	7.31	4.07	.025	0.18
Interpersonal distrust	18.4 (4.4)***	18.29	5.74	23.50	6.19	25.35	5.27	4.29	.021	0.19
Interoceptive awareness	22.0 (5.7)***	25.57	6.68	32.60	11.96	39.13	9.02	5.92	.006	0.24
Maturity fears	20.8 (4.7)***	27.86	6.67	27.40	7.81	29.04	9.03	0.15	.860	0.01
EDI-total	223.2 (38.1)***	179.42	41.49	211.50	49.55	245.65	45.56	6.19	.005	0.25

		Bulimia nervosa								
	Norm[1]	[2] Not clinical		Discrete		Clinically apparent				
EDI-2	*M* (*SD*)	*M*	(*SD*)	*M*	(*SD*)	*M*	(*SD*)	*F*	*p*	ES
Drive for thinnness	17.3 (6.8)***	29.92	8.34	36.80	5.76	36.95	6.92	3.80	.032	0.18
Bulimia	10.6 (3.4)***	23.33	9.03	27.20	6.38	26.81	8.62	0.71	.490	0.04
Body dissatisfaction	30.2 (10.3)***	36.25	12.47	47.40	5.55	47.33	9.34	4.94	.013	0.22
Ineffectiveness	23.5 (5.7)***	27.92	10.38	39.60	11.13	43.00	9.86	8.48	.001	0.33
Perfectionism	16.5 (5.7)***	15.92	4.56	17.60	3.21	26.24	6.11	15.76	.001	0.47
Interpersonal distrust	18.4 (4.4)***	19.50	5.54	24.20	5.55	27.52	5.68	7.79	.002	0.31
Interoceptive awareness	22.0 (5.7)***	29.50	9.65	39.20	10.28	41.67	7.95	7.40	.002	0.30
Maturity fears	20.8 (4.7)**	22.83	5.73	28.20	4.44	26.81	8.77	1.37	.270	0.07
EDI-total	223.2 (38.1)***	205.16	43.94	260.20	31.01	276.33	42.07	11.30	.001	0.39

Note: EDI-2; Eating Disorders Inventory-2;

[2] ETI cut-off-scores: not clinical (0–15 points), discrete (16–26 points) and clinically apparent (≥27 points).

[1] ** clinically apparent vs. Norm ≤.01; *** clinically apparent vs. Norm ≤.001 (Paul & Thiel, 2005)

Table 5

multiple regression analysis for variables predicting ED- and PTSD-symptomatology

Criterion and predictors		b	T	p
I. ED Symptomatology				
AN				
R^2=.349	Sense of Coherence	−.591	−5.17	.001
BN				
R^2 =.605	Sense of Coherence	−.712	−8.19	.001
R^2 =.672	Currently perceived stress	.295	3.43	.001
R^2= .698	Sexual assault	−.168	−2.03	.048
II. PTSD Symptomatology				
AN				
R^2=.159	Number of traumatic events	.329	2.52	.015
R^2=.232	Low Education	.262	2.15	.036
R^2=.299	Social support	−.277	−2.13	.038
BN				
R^2=.299	Sense of Coherence	−.516	−4.63	.001
R^2=.409	Number of traumatic events	.334	2.99	.004

Notes: Independent variables in each regression model: age, education, duration of psychotherapy, duration of ED, type trauma (sexual assault, nonsexual assault, non-manmade trauma), number of traumas, A2-criterion (not for PTSD), currently perceived stress due to the trauma (not for PTSD), time since worst event, sense of coherence, social support