



Relationship between Trauma History and Eating Disorders in Adolescents

Taylor Groth¹ · Mark Hilsenroth¹ · Dana Boccio¹ · Jerold Gold¹

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Abstract

Reasons for developing an eating disorder (ED) are complex, yet one plausible risk factor gaining more relevance in adolescents with EDs is childhood trauma. The current study is the first to examine the presence of childhood trauma in relation to ED symptomatology in adolescents using DSM-5 criteria. It was hypothesized that patients with more traumatic experiences also have more severe ED symptoms. 112 therapists currently treating adolescent patients diagnosed with an ED completed an online survey consisting of a DSM-5 ED symptom checklist and a childhood trauma questionnaire on a current adolescent patient whom they have seen for at least eight sessions. Children with multiple traumatic experiences and the severity of those experiences demonstrated a relationship to overall ED ($r = .179, p = .059$) and bulimia symptoms ($r = .183, p = .054$), specifically bingeing ($r = .188, p = .047$), and purging ($r = .217, p = .021$). In addition, logistic regression analyses indicated that adolescents high on bulimia nervosa ($B = 4.694, p = .044$) were more likely to have been traumatized victims of violence. Exploratory analyses support prior literature that suggest similarities between adolescents' lack of control of the experienced trauma(s) with lack of control of ED symptoms. These findings highlight the importance of exploring trauma history when treating an adolescent with an ED, especially bulimia.

Keywords Trauma · Adolescents · Eating disorders · Bulimia

Despite the extensive literature on adults with EDs (National Institute of Mental Health [NIMH], 2017), there is much less research on adolescents. The NIMH reported that the lifetime prevalence of EDs within U.S. adolescents, aged 13 to 18, was 2.7%, occurring twice as frequently in females (3.8%) than males (1.5%) (NIMH, 2017). The prevalence rates of EDs also showed an increase with age during adolescence. However, the NIMH did not conduct prevalence rates by ED type, for Anorexia Nervosa (AN), Bulimia Nervosa (BN), Binge Eating Disorder (BED) or Other Specific Feeding or Eating Disorder (OSFED). Previously, Swanson et al. (2011) sought to advance the literature by examining the prevalence and correlates of EDs in adolescents from a large sample of population-based surveys. Swanson and colleagues found

the lifetime prevalence to be 0.3% AN, 0.9% BN, and 1.6% BED with the median age of onset being approximately 12 years old. In addition, BN and BED were frequently comorbid with other psychiatric disorders, and AN was most associated with Oppositional Defiant Disorder. In regard to treatment, no treatment attendance or success rates could be located. However, Rome and colleagues concluded that recognizing and treating the disorder early are critical in decreasing morbidity and mortality rates in adolescents with EDs (Rome et al. 2003). Since both the Swanson et al. 2011 and Rome et al. 2003 studies were conducted before publication of the DSM-5, additional research should attempt to expand and confirm these findings for these new updated diagnostic criteria, in addition to a dearth of literature on risk factors for adolescents that develop EDs.

For these three most common EDs, the reasons for development are complex, yet the current literature presents various plausible risk factors. For AN, risk factors include having anxiety or displaying obsessional traits in childhood, being involved in a job (i.e., modeling) or sport where thinness is valued, or having a familial history of anorexia (genetic and social links) (APA, 2013). Previously identified risk factors of

✉ Taylor Groth
taylorgroth@mail.adelphi.edu

¹ Demer School of Psychology, Adelphi University, 158 Cambridge Avenue, Room 302, Garden City, NY 11530, USA

BN include low self-esteem, depression and anxiety, idealization of thin bodies, childhood obesity, and early puberty (APA, 2013). Although BED is a newly recognized disorder, a few recognized risk factors are having family members with a history of binge eating, a tendency to externalize problems (Allen et al. 2016), and a habit of eating when not hungry (Balantekin et al. 2017).

With these identified plausible risk factors for each ED, one factor that is gaining more relevance in adolescents with EDs, is childhood trauma. The literature to date highlights that a significant amount, approximately 50%, of individuals diagnosed with EDs report a history of childhood trauma and abuse (Carter et al. 2006; Rodriguez et al. 2005). Thus, it is understood that those who encounter a traumatic experience in their childhood are more vulnerable to developing an ED than children who do not. This is further supported by a meta-analysis, which identified stressful and challenging environmental factors (including traumatic events) as precursors to the development of EDs (Dalle Grave 2011).

Bruch (1981) states that individuals who develop EDs experience a lack of control over their body and lack of conviction for living their own life. Childhood trauma and its associated perceived loss of control is a suspected underlying mechanism of EDs, as the ED symptoms are an attempt to regain control. However, some ED symptoms, for example BN and BED, involve criterion of a loss of control with bingeing and purging episodes. Smolak and Murnen's (2002) meta-analysis identified the similarities between the lack of control present in traumatic experiences and in ED symptoms. Additionally, Waller (1998) found that specifically victims of abuse lack perceived personal, internal control and seek an external locus of control, which is linked to ED symptomatology.

Kong and Bernstein (2009) labeled three broad traumatic out of control experiences as predictors of ED: emotional abuse, physical neglect, and sexual abuse. Emotional abuse appears to be the most prevalent traumatic experience among individuals with EDs (Carretero-Garcia et al. 2012). However, emotional abuse typically accompanies other or multiple types of abuse. These traumatic experiences cause emotional distress and affective deficiencies, including depressed mood, low self-esteem and generalized anxiety (Polivy and Herman 2002), therefore the emotional trauma that is frequently experienced with additional types of traumas render these experiences important in the study of the risk factors of EDs. The intense, overwhelming, out of control, and sometimes intolerable emotions that result from the aforementioned types of trauma have been found to influence disordered eating behaviors as coping mechanisms (Polivy and Herman 2002). A focus on eating displaces the emotions from the trauma onto food and body shape. In addition, such individuals seek control over future traumatic events and associated emotions

through controlling food (Polivy and Herman 2002). Thus, it is likely that trauma, including neglect, physical abuse, and sexual abuse, is a risk factor for developing an ED.

Childhood experiences of neglect (Dalle Grave 2011; Sweetingham and Waller 2008) and sexual abuse (Smolak and Murnen 2001; Wonderlich et al. 2001) are associated with emotional abuse, and also linked to disordered eating behaviors. Johnson et al. (2002) found that individuals who were subject to physical neglect during childhood were more vulnerable to experiencing various types of problems related to eating and weight. Specifically, parental neglect due to insecure parent-child attachments were found to predict increases in eating disordered behavior and symptoms such as dietary restraint, and eating, weight, body shape concerns, and episodes of binge eating (Goossens et al. 2012). In addition, childhood sexual abuse (CSA) is linked to the development of EDs (Smolak and Murnen 2001; Wonderlich et al. 2001), which is understood because it is believed to affect identity and body image (Kearney-Cooke and Striegel-Moore 1994). With this, such individuals have shown to develop dissociative coping styles, such as binge eating (Perry et al. 1995) or seek to regain control through limiting food intake (Schwartz and Cohn 1996). Thus, childhood neglect and sexual abuse have been identified as risk factors for EDs.

There is a longstanding history of research that associates physical abuse with increased risk of developing an ED. From a sample of women who were diagnosed with AN, BN or BED, it was concluded that women who experienced childhood physical abuse had twice the odds of developing an ED (Rayworth et al. 2004). Physical abuse particularly in forms of bullying and teasing among peers, are also traumatic interpersonal experiences that are linked to the development of any type of ED (Polivy and Herman 2002; Sweetingham and Waller 2008). Thus, childhood physical abuse is historically associated with AN, BN and BED. However, more specifically, 36% of 145 outpatients with BED reported experiences of physical abuse in their childhood (Grilo and Masheb 2001). In addition, such abuse has been identified as a specific risk factor for BN (Welch and Fairburn 1996). Therefore, specific research with various ED population, point to childhood physical abuse as risk factors for EDs.

More recent literature associates a history of multiple trauma types and trauma severity with EDs. For example, Tagay and colleagues identified a traumatic history with multiple trauma types as a risk factor for EDs (Tagay et al. 2014), specifically including physical and sexual abuse (Rayworth et al. 2004). Moreover, Smyth and colleagues found trauma severity to be related to greater ED symptomatology in general, and more explicitly bingeing and purging symptoms (Smyth et al. 2008). Thus, with childhood physical abuse identified as a risk factor for EDs, multiple types of trauma and trauma severity have also been linked to the development of EDs.

Aims of the Current Study

There is a limited but consistent relationship that childhood trauma may be related to ED symptoms, specifically within an adolescent population. Prior research that demonstrates this relationship is also based on DSM -IV criteria or earlier, there is no existing research that assesses this relationship using the DSM-5 ED criteria. In addition, it is unknown whether or how different types of trauma may be related to ED symptoms in adolescents. The present study is unique and distinctive, as it is the first to examine a range of childhood traumatic experiences in relation to various constellations of symptomatology in adolescents with EDs using DSM-5 criteria. The first aim of the study was to assess the relationship of a trauma history (present/absent) and the different types of trauma with EDs. It was hypothesized that the presence of a childhood trauma would be associated with EDs. The second aim was to assess the sum of the different trauma types experienced in relation to ED disorders and symptoms. It was hypothesized that adolescent patients with multiple types or poly-traumatic experiences would report more ED symptoms. The third aim of the study was to examine the relationship between the severity of traumatic experiences with ED disorders and symptoms, to which it was hypothesized that patients with greater severity of their traumatic experiences would report more ED symptoms.

Methods

Participants

Participants consisted of 112 therapists currently treating an adolescent with an ED. Participants from the United States and Canada were recruited to permit attainment of a geographically diverse sample. Table 1 presents participants' demographic data. The average age of the sample was 43.55 years ($SD = 13.23$), and the mean length of time practicing as a clinician was 16.17 years ($SD = 11.62$). Therapist discipline varied from a Masters or Doctoral degree in mental health (M.A., M.S., M.S.W., M.H.C., Ph.D., Psy.D.) or in medicine (M.D.), and came from various theoretical orientations.

Procedures

All participants represent those treating adolescent patients with eating disorders in private practice, and/or community clinics. Participants were recruited from several professional listservs obtained through [PsychologyToday.com](https://www.psychologytoday.com), National Eating Disorder Association (NEDA), International Association of Eating Disorders Professionals (IAEDP), Academy for Eating Disorders (AED), APA Division 29, Society for Psychotherapy Research (SPR), and Society for

the Exploration of Psychotherapy Integration (SEPI). Participants received the invitation via their work e-mail to participate in the study on their own technological device (work computer, laptop, etc.). This invitation included a solicitation flyer, which briefly described the study and the option for participants to anonymously complete an online Qualtrics survey at a website address whenever and wherever they felt most comfortable to do so (uncompensated). Therapists were also informed that their decision to participate would have no impact on the treatment they provide and were encouraged to contact the principal investigator with any questions about the investigation. Participants who clicked on the survey link had immediate access to the questionnaire, and by clicking "I Consent," consented to participate in the study.

To complete the survey, therapists were asked to select an adolescent (13 to 18 years old, (see Swanson et al. 2011) patient diagnosed with an ED currently in their care, with whom they had worked for a minimum of eight sessions (to insure the therapist knew the patient well). To minimize selection biases, clinicians were directed to consult their calendar and select the last patient they saw during the week who met the criteria (see also: Betan et al. 2005; Tanzilli et al. 2017). Therapists were informed in writing that they should put no identifying information throughout the survey and that the ratings would be completely confidential, to ensure complete anonymity. In addition, they were informed that all data would be stored electronically on a secure server and a password-protected website accessible only to the principal investigators. However, if participants wished to not answer any question, the items would be left blank without penalty. The data was collected over a 3-month period, beginning in August 2018. To increase response rates, three waves of solicitations were posted on these various websites, including the initial in August, 1 month following in September, and again 1 month following in October. These efforts aided in achieving a sufficient response rate to obtain 112 mental health professionals. With this procedure, this study met all ethical standards and safety monitoring procedures.

Measures

Demographic Information Participants were asked six demographic questions pertaining to gender, age, clinician discipline, years of practicing as a clinician, years licensed, and theoretical orientation.

DSM-5 ED Criteria Symptom Checklist Participants were administered an exhaustive checklist of the 16 symptoms of Anorexia Nervosa, Bulimia Nervosa, Binge Eating Disorder, and Other Specified Feeding and Eating Disorder, to determine the presence or absence of these symptoms according to DSM-5 criteria.

Table 1 Demographic and clinical information of therapist sample ($N = 112$)

Variable	Value	No.	%
Gender	Male	7	6.3
	Female	105	93.8
Mean Age (SD)		43.55(13.23)	
Discipline	Psychiatrist	7	6.3
	Psychologist	53	47.3
	Social Worker	13	11.6
	Trainee	5	4.5
	Masters Level Therapist	30	26.8
	Other	4	3.6
Mean Years of Work as Clinician (SD)		16.17 (11.62)	
Theoretical Orientation	Cognitive/Behavioral	52	46.4
	Psychodynamic	16	14.3
	Interpersonal	14	12.5
	Family/Systems	8	7.1
	Humanistic/Existential	4	3.6
	Other	18	16.1

Childhood Trauma Questionnaire - Childhood Traumatic Events Scale (Pennebaker and Susman 2013) The Childhood Trauma Questionnaire is a 13 item, patient-rated assessment of their experience on one scale of childhood traumatic events and on another scale of recent traumatic events. For the current study, six-items from the childhood traumatic events scale were adapted to a therapist-response style, to inquire about their patients' experience with childhood trauma. The items assess whether or not a specific traumatic event occurred, and if so, at what age, and how severe the traumatic event was for their patient (where 1 = not at all and 7 = extremely traumatic). The validity and reliability of the Childhood Trauma Questionnaire has been demonstrated on a variety of populations in numerous studies, including adolescent samples (Bernstein et al. 1997; Suliman et al. 2009) and eating disorder samples (Kong and Bernstein 2009; Fischer et al. 2010).

Results

The patient sample demographic and diagnostic information is presented in Table 2. Patients averaged 16.22 years old, ($SD = 2.14$). Of the 112 patients reported on, 106 were female (94.6%) and 6 were male (5.4%). The majority of patients carried a diagnosis of Anorexia Nervosa ($n = 73$, 65.2%), with Bulimia Nervosa ($n = 15$, 13.4%) and OSFED ($n = 15$, 13.4%) being the second most common, and Binge Eating Disorder being slightly less common ($n = 9$, 8.0%). In addition, the trauma history of this patient sample is presented in Table 3. Over two-thirds of these ED patients reported having a trauma history (Trauma History $n = 77$, 68.8%; No Trauma History $n = 35$, 31.3%), including experiencing a major upheaval

between parents ($n = 34$, 30.4%), or the death of a close friend or relative ($n = 24$, 21.4%), being extremely ill or injured ($n = 21$, 18.8%), having a traumatic sexual experience ($n = 18$, 16.1%), and being a victim of violence ($n = 5$, 4.5%). Additionally, 45 (40.2%) patients experienced another major upheaval that was considered traumatic and had a large impact on them. Overall, 50 patients (44.6%) reported being victim to multiple traumatic experiences, or poly-trauma.

The first aim for this study was to examine the presence or absence of any traumatic experience (CTQ-TR) and its relation to ED disorders and symptomatology (DSM-5 ED Symptom Checklist). In examining the presence or absence of any traumatic experience and the various types of traumatic experience, we utilized logistic regressions, forward entry with .05 significance level. Overall, the categorical presence ($n = 77$) or absence ($n = 35$) of any traumatic experience was not significantly related to any specific type or overall amount of ED symptomatology ($R = .134$, $p = .771$). Next, we examined the six specific types of traumatic experiences in relation to ED diagnostic symptoms, and one was found to reveal a significant relationship. Specifically (see Table 4) findings demonstrated that adolescents high in BN symptoms ($B = 4.694$, $p = .044$) and low in OSFED symptoms ($B = -1.770$, $p = .031$) were more likely to have been a victim of violence ($R = 0.596$, $p = .006$). Based on these results, additional exploratory logistic regressions were examined to identify which symptoms within the BN and OSFED diagnostic constellations were significant in relation to victim of violence trauma. These analyses indicated that within the BN symptom cluster those who had at least four uncontrollable binges a month were predicted to be a victim of violence ($B = 2.228$, $p = .055$). Furthermore, within the OSFED symptom cluster,

Table 2 Demographic and diagnostic information of patient sample (N = 112)

Variable	Value	No.	%
Gender	Female	106	94.6
	Male	6	5.4
Mean Age (SD)		16.22 (2.14)	
Eating Disorder Diagnosis	Anorexia Nervosa	73	65.2
	Bulimia Nervosa	15	13.4
	Binge Eating Disorder	9	8.0
	OSFED	15	13.4
Reported Trauma History	Death of close friend/relative	24	21.4
	Major upheaval between parents	34	30.4
	Traumatic sexual experience	18	16.1
	Victim of violence	5	4.5
	Extremely ill or injured	21	18.8
	Any other major upheaval	45	40.2
	None	35	31.3

having at least two compensatory behaviors (i.e. purging via laxatives, diuretics or self-induced vomiting) per month ($B = .139, p = .034$) was significantly related to being a victim of violence. The finding regarding this specific OSFED item is in contrast to OSFED being a negative predictor as a diagnostic category to victim of violence trauma, when assessed individually. Whereas, this specific OSFED symptom was positive in relation to victim of violence trauma.

A second aim of this study was to assess the impact of multiple types of trauma history for a given patient, in terms of no trauma ($n = 35$), single trauma ($n = 27$), or poly-trauma ($n = 50$), with ED type and overall symptomatology (see Table 5). Pearson’s r coefficient tested the strength of these associations, two-tailed, with effect sizes approximately .10, .30, and .50 respectively considered small, medium and large (Cohen 1988). Results revealed a small effect trend towards significance between the total number of different trauma types experienced (0–6) with ED total symptoms ($r = .179,$

$p = .059$) and BN symptoms ($r = .183, p = .054$). Thus, when patients experienced multiple types of childhood trauma, the more likely they were to be high on overall total ED symptoms and BN symptoms. With these results, we undertook an exploratory analysis of the individual ED symptoms in relation to the number of trauma experiences. We found two symptoms were significantly related to these instances of poly-trauma, including the patient having at least four compensatory behaviors (e.g., purging via laxatives, diuretics or self-induced vomiting) a month ($r = .217, p = .021$) and binge eating characterized by eating an amount of food larger than what most people would eat in a discrete period of time (e.g., 2 h) and a sense of lack of control over eating during the episode ($r = .188, p = .047$). In addition, marked distress about binges trended toward significance ($r = .160, p = .093$).

The third aim of the study assessed the relationship between trauma sum severity (1–7), the additive value of severity ratings from all the different traumatic experiences (0–6) reported for a given patient, with ED type and overall ED symptoms (See Table 5). Results demonstrated a significant relationship between trauma sum severity and total ED symptoms ($r = .194, p = .040$) as well as BN symptoms ($r = .236, p = .012$). Given this finding, we sought to further explore the relationship between trauma sum severity and the individual ED symptoms. Results revealed that patients with greater severity of traumatic experiences across the different trauma types was related to having at least four compensatory behaviors (e.g., purging via laxatives, diuretics or self-induced vomiting) a month ($r = .266, p = .005$). In addition, three symptoms trended toward significance, including binge eating characterized by rapid eating, eating until full, feeling disgusted, etc. ($r = .185, p = .051$), having marked distress about binges ($r = .174, p = .067$), and having at least two compensatory behaviors ($r = .174, p = .068$). Therefore, with greater trauma severity, ED adolescents are more likely to have more overall ED symptoms and BN symptoms, more specifically, binge eating and compensatory behavioral symptoms (e.g., purging via laxatives, diuretics or self-induced vomiting). In total, while the results of this study are significant, these findings are largely small effects, suggesting that trauma likely has

Table 3 Raw frequency of trauma type, mean and standard deviation of trauma severity for the sample (N = 112)

Trauma Types	Overall			AN (73)			BN (15)			BED (9)			OSFED (15)		
	F(x)	M	SD	F(x)	M	SD	F(x)	M	SD	F(x)	M	SD	F(x)	M	SD
Death of a close friend/relative	24	1.05	2.05	12	0.79	1.81	4	1.53	2.67	1	0.67	2.00	7	2.07	2.31
Major upheaval between parents	34	1.53	2.44	21	1.45	2.37	5	1.20	2.21	3	2.00	3.00	5	1.93	2.79
Traumatic sexual experience	18	1.01	2.28	11	0.95	2.22	2	0.93	2.46	1	0.67	2.00	4	1.60	2.64
Victim of violence	5	0.29	1.22	2	0.19	1.01	1	0.40	1.55	2	1.22	2.44	0	0.13	0.35
Extremely ill or injured	21	0.83	1.75	16	1.00	1.94	2	0.60	1.68	1	0.44	1.33	2	0.47	0.92
Any other major upheaval	45	2.13	2.68	30	2.19	2.73	3	1.13	2.36	3	1.67	2.55	9	3.13	2.67

Table 4 Logistic regression analyses by trauma type presence ($N = 112$)

Independent Variable	B	SE	Beta	Odds Ratio	z	p
Anorexia Symptoms (0–3)	0.726	0.854	0.551	2.068	0.851	0.395
Bulimia Symptoms (0–3)	4.694	2.330	3.619	109.309	2.015	0.044
Binge Eating Symptoms (0–4)	0.686	0.575	0.947	1.986	1.194	0.233
OSFED (0–4)	-1.770	0.822	-2.831	0.170	-2.154	0.031

Final Model: $R = .596$, $R^2 = .355$, $df = 107$, $X^2 = 14.517$, $p = .006$

Eating disorder symptom severity as a function of being a victim of violence (yes/no)

some relationship with EDs in adolescents, but it is clearly one of several factors.

Discussion

The present study is the first study to examine the relationship between childhood trauma and adolescent EDs using DSM-5 criteria. Thus, the initial aim of our research was to assess the relationship between the presence of a childhood trauma history and ED symptomatology among adolescent patients with EDs. Not only did the majority of our sample report a history of trauma, but our results also demonstrated the relationship between specifically being a victim of violence (i.e. physical abuse) with high BN symptoms and low OSFED symptoms. At the BN and OSFED symptom level, we found that among eating disordered adolescents, physical abuse was related to multiple uncontrollable binges and compensatory behaviors (e.g., purging via laxatives, diuretics or self-induced vomiting). This is consistent with the findings of Root and Fallon, who in their 1988 study found that 66% of their sample of 172 women with Bulimia had been a victim of violence (Root and Fallon 1988). Later studies that assessed this relationship also found physical abuse to be more prevalent in adults with BN compared to controls (Welch and Fairburn 1996; Rorty et al. 1995).

Even more specific and similar to our results, two studies have found childhood physical abuse to be most strongly associated with BN compared to other EDs in adolescent and

young adult women (Andrews 1997) and adult women (Rayworth et al. 2004). Andrews (1997) specifically found associations between childhood physical abuse, bodily shame, and BN (DSM-III criteria). However, childhood physical abuse and BN were no longer related when bodily shame was considered. Given these results, they identified bodily shame as a potential mediator between childhood physical abuse and adolescent BN. Moreover, Rayworth and colleagues also found a relationship between childhood physical abuse and EDs (DSM-IV criteria) in adult women (Rayworth et al. 2004). They further recognized an underlying link of control between the two phenomena, based on Smolak and Murnen's (2002) meta-analysis on childhood abuse and EDs. Thus, they noted that physical abuse may leave victims feeling like they lack control over their lives and develop EDs in order to regain a modicum of control over some aspect of their lives (Rayworth et al. 2004). Despite the lack of studies in this area, these findings appear to be consistent with current conceptualization of adolescent ED in the DSM-5.

The second aim of our study was to examine how the number of different traumatic experiences was related to ED type and symptomatology. The previously identified relationship between victim of violence, ED and BN appears to be even more prominent in individuals who encounter multiple categories of trauma (i.e. poly-trauma). Not only did we find childhood poly-trauma to be positively related to overall ED symptom count and BN, but at the individual level all ED patients that were victims of violence, all also had a history of poly-trauma. These findings support the relationship between patients with poly-trauma and EDs that is consistent with prior research that came to the same conclusions using previous ED criteria from earlier versions of the DSM (Brewerton 2007; Schoemaker et al. 2002). Brewerton's (2007) review paper on EDs and their relation to trauma and comorbidity made two important conclusions; first, the majority of women with BN report having PTSD symptoms, and second, the relationship between BN and a history of numerous instances or types of abuse. In addition, Schoemaker et al. (2002) assessed childhood poly-trauma in

Table 5 Pearson correlation of trauma sum with ED types ($N = 112$)

		AN	BN	BED	OSFED	Total ED Symptoms
Trauma Sum	r	.061	.183	.135	.102	.179
	p	.522	.054	.157	.285	.059
Trauma Sum Severity	r	.050	.236	.150	.105	.194
	p	.600	.012	.114	.269	.040

relation to BN in adults (DSM-III R criteria) and identified a history of multiple childhood traumatic experiences as a risk factor for BN, as well as other comorbid psychiatric disorders and substance use disorders. Moreover, Rayworth and colleagues concluded that individuals who experienced more than one type of trauma, specifically both physical and sexual abuse, were significantly more likely to develop an ED than individuals who did not encounter any abuse (Rayworth et al. 2004). Given these findings, a relationship between multiple types of childhood traumatic experiences and presence of ED symptoms is apparent, specifically with BN symptoms. This implies the importance of inquiring about physical abuse and poly-trauma histories in adolescent patients with BN.

The third and final aim of this study was to assess the severity of these traumatic experiences in relation to ED. Again, we found that ED patients with greater trauma severity were more likely to be high on ED symptoms and BN symptoms. This supports prior findings by Smyth and colleagues who found a relationship between overall trauma severity with EDs, as well as specific symptoms of bingeing and purging (e.g., compensatory behaviors) (Smyth et al. 2008). This is also consistent with our findings, that within the BN cluster, patients with greater severity of traumatic experiences were more likely to use at least four compensatory behaviors (e.g., purging via laxatives, diuretics or self-induced vomiting) per month. In addition, among all of the ED symptoms, several trended toward significance. These findings suggested that ED patients with greater severity of traumatic experiences were more likely to also use at least two compensatory behaviors per month, engage in binge eating episodes, and have marked distress about binges. Moreover, Smyth and colleagues found that trauma type and severity were related to increases in these symptoms over time (Smyth et al. 2008). Thus, individuals with a history of severe traumatic experiences may not only be at greater risk for developing an ED but also for more severe forms of ED, and especially in regard to specific BN bingeing and purging symptoms.

These results support previous hypotheses that a lack of control from multiple traumatic experiences may be related to the same issues of control observed in EDs. Both phenomena, trauma and ED symptoms, are intense, overwhelming, and out of control experiences, which is supported by Polivy and Herman (2002) who recognized that individuals with EDs may acquire and maintain ED symptoms as an attempt to cope with issues of personal control. In addition, Polivy and Herman (2002) specifically identified that eating disordered individuals respond to experiences that lack internal or external control (i.e. trauma) by seeking control through ED symptoms, however ultimately lose control during binge episodes and the use of compensatory behaviors (acts to undo eating or to prevent weight gain; e.g., purging via laxatives, diuretics or self-induced vomiting). The conclusions of Polivy and Herman (2002) are remarkably consistent with the current

study's findings, despite being replicated on a different sample with earlier DSM criteria. This demonstrates clinical utility and directs clinical attention to early childhood trauma with this constellation of bulimic symptoms and disorder.

The present study's results, specifically the lack of findings between AN and individual AN symptoms with trauma, support previous findings. Jaite and colleagues assessed the relationship between childhood trauma with AN restricting type and AN binge-eating/purging type in adults and concluded that patients with binge/purge type were more likely to report a childhood trauma history than restricting type patients (Jaite et al. (2012). Moreover, restricting patients and control participants showed no differences in childhood traumatization. Related, another study found the highest trauma rates to be among bulimic patients, and concluded no significant relationship between AN and trauma (Dalle Grave et al. 1996). Overall, the majority of the existing literature concludes the relationship between trauma and BN, with minimal research commenting on a trauma history and its relation to AN.

The present study had three aims to assess the relationship of ED type and ED symptomatology with the presence or absence of a childhood trauma history, the amount of different traumatic experiences in childhood, and the severity of those traumatic experiences. There were a few notable consistencies across these three aims, including the relationship of both the number and severity of traumatic experiences to the total amount of ED symptoms, and specifically BN symptoms. Related, patterns of individual symptoms were also present across these trauma variables, including binge episodes and compensatory behaviors. Specifically, the presence of violent childhood trauma was related to having at least four uncontrollable binges per month, while the amount of different traumatic experiences was similarly associated to binge episodes with a lack of control and marked distress. In addition, the amount of different trauma types and the severity of all the traumatic experiences were both related to having at least four compensatory behaviors (e.g., purging via laxatives, diuretics or self-induced vomiting) per month. Thus, clinicians should be keen to the association between trauma histories and ED symptoms so that when patients present with either a trauma history or ED symptoms, they conduct in-depth evaluations of the other corresponding phenomena. In addition, clinicians should also be aware that the relationships between specific trauma variables and ED symptomatology appear to be linked by a theme of control, desire for or lack thereof. Overall, our findings demonstrate the relationship between trauma and EDs, specifically BN with bingeing and purging behaviors, further supporting this link to themes of control. These findings can and should inform clinicians' conceptualization and treatment approach when working with an eating disordered adolescent patient with a trauma history.

With awareness of trauma's relation to ED, it should also be noted that not all individuals with a history of trauma

develop an ED, and not all individuals with an ED report memories of trauma. In the present study of patients with ED, a relatively large percentage (31%) do not report a history of trauma. Similar to how etiology and presentation of a disorder differ across patients, the pathway of developing an ED may also differ across patients. Madowitz et al. (2015) discuss two etiological pathways from trauma to ED, one of body dissatisfaction, shame, and fear of trauma, and the second of failure of the typical and expected environment, need for control, and coping with psychological diagnoses and emotional regulation. The authors discuss these pathways in relation to trauma, however, it is very possible ED patients without a trauma history experience aspects of these pathways (i.e. body dissatisfaction, shame, need for control, coping with psychological diagnoses and emotional regulation difficulties) with a different underlying factor that is not trauma. Polivy and Herman (2002) also identified body dissatisfaction as a cause of ED, as well as sociocultural factors (e.g., peer influences), family factors (e.g., enmeshment), negative affect, and low self-esteem. It seems that in addition to trauma, there are additional identified risk factors and other pathways of developing an ED. Thus, trauma appears to be one of several risk factors and pathways to developing EDs in adolescents. Future research should examine the differences between ED individuals with and without a trauma history, comparing different etiological pathways with ED presentation and severity. Such information would be useful in informing and guiding clinicians' conceptualizations and approach to treatment of ED individuals with or without a trauma history.

In the treatment of ED patients with a trauma history, previous research found potential in treatments that emphasize self-control to reduce ED symptoms related to trauma and control. Waller (1998) first identified a link between an external locus of control and ED symptomatology in women who were abused and recommended that clinical work focus on cognitions of personal control. In another study, ED patients found treatment to be more satisfying when approaches focused on developing eating habits with a sense of self-control (Clinton et al. 2004), thereby reducing out of control bingeing and purging behaviors. In addition, a treatment that identified triggering situations that led to feeling loss of control and then worked to develop strategies to maintain control was found to decrease frequency of purging episodes and improve eating attitudes overall (Schneider and Agras 1985). Thus, treatment of ED patients should use approaches that focus on enhancing self-control.

Additionally, our findings support the previous clinical suggestions of Wonderlich and colleagues who note the complexity of treating ED patients with a trauma history and recognized that clinicians may need to focus on trauma history and associated comorbid disorders (e.g., PTSD, substance abuse) before being able to effectively treat the ED (Wonderlich et al. 1997). Further,

Tasca and colleagues recognize the importance of interventions examining relational and attachment issues of ED patients (Tasca et al. 2009), which may be related to these traumatic experiences. Specifically, this study concluded that ED patients with attachment anxiety may benefit from impulse regulation and reflective functioning, whereas ED patients with avoidant attachment may benefit from exposure to affective expression and interpersonal connectedness. Thus, although self-control might be useful in treating ED symptoms, trauma seems to be an important clinical issue of focus with ED patients, and BN in particular. Therefore, it seems both timely and prudent to think about treatment for BN as being more than just focused on the symptoms, but also exploring trauma related issues on the impact of self-perception and relational functioning.

This is supported by two RCT studies that compared cognitive behavioral therapy (CBT) and psychodynamic therapy (PDT) in the treatment of BN. The CBT focus included exploring problematic behavior and psychoeducation, correcting eating disordered symptoms and dysfunctional cognitions, training in social skills, affect regulation and problem solving, and addressing relapse prevention. PDT understands BN symptoms as being a displacement from the psychological self to the physical self (i.e. body), and approaches treatment by working through personal patterns and conflicts that underpin the BN symptoms (Stefini et al., 2017). Stefini and colleagues found no differences between CBT and PDT at the end of treatment, however patients of PDT had greater improvements in eating concerns compared to patients of CBT at the 12-month follow up. Similarly, Poulsen et al. (2014) compared the two treatment approaches on patients with BN and concluded that psychoanalytic psychotherapy had an effect on global eating disorder psychopathology, which was attributed to working through patient's issues related to their BN symptoms. With this, they noted that treatment approaches that address such issues, as well as more directive and behavioral interventions, might be most effective in treating BN and related underpinning issues. In all, treatment of BN symptoms alone appears to not be effective, and that treatment should also focus on other underpinning issues. Related, Richards and colleagues conducted an evidence-based study to assess integrative dynamic therapy (IDT) for BN (Richards et al. 2016). The integrative treatment was comprised of 4 weeks of CBT techniques including psychoeducation, self-monitoring and regular eating, followed by psychodynamic approaches that focused on emotional expression and regulation, interpersonal relationships, and intrapsychic conflict. Through a BN case study, Richards and colleagues demonstrated the possibility and utility of the successful integration of CBT and PDT that addressed obsessional personality issues and emotional avoidance. These more recent studies support the development and application of a treatment that

incorporates a CBT approach with focus on ED symptoms in conjunction with a psychodynamic approach with focus on the underpinning issues (e.g., intrapsychic and interpersonal conflicts, emotional expression and regulation) of these symptoms.

Limitations

Despite being the first study to examine the relationship between childhood trauma and adolescent EDs using DSM-5 criteria, there are a few limitations that are important to note. First, the data collection method (self-report) from one informant (clinician) perspective may affect validity. However, multiple studies have displayed that therapists make reliable and valid judgments of their patient symptoms and traumatic experiences reported in treatment when rated on well-established psychometric instruments like the ones included in this study (Bernstein et al. 2003; Paivio and Cramer 2004; Sysko et al. 2012). Second, we did not inquire about the patients' Axis I comorbid diagnoses. Individuals with EDs and additional Axis I diagnoses would understandably have more severe symptoms and be more complex to treat. Due to this lack of inquiry, we were not able to assess and compare ED individuals with and without comorbid Axis I diagnoses. Existing literature that has assessed comorbid diagnoses of EDs and Axis I disorders found that a high percentage of young adults with EDs also met criteria for an Axis I disorders (Lewinsohn et al. 2000; Zaider et al. 2000). Additionally, Keel and Brown (2010) concluded that greater psychiatric comorbidity in individuals with EDs are more likely to have worse prognosis. Therefore, it is common for individuals with EDs to also carry a comorbid Axis I diagnosis, as well as experience more difficulty in treatment. Overall, it is a potential limitation that we did not inquire about patient's Axis I comorbid diagnoses, but this may not have that large of an effect on found differences. Third, in any regression model the results are limited to the sample its derived from. Therefore, we would suggest additional research conduct similar and related associations between these variables with a larger sample size.

Conclusions

Despite these limitations, these results have critical implications for clinical interviewing and treatment as this is the first study to examine the relationship between childhood trauma and adolescent EDs using DSM-5 criteria. Overall, we have identified a relationship between childhood trauma, and poly-trauma with adolescents diagnosed with DSM-5 EDs. While our results are significant, they have largely small effect sizes and thus trauma likely has some relationship with EDs in adolescents, but it is clearly one of several etiological factors and is not always present in adolescents with EDs. In addition to other risk factors, given our findings, clinicians should be

attuned to trauma experiences, especially physical abuse history, when working with eating-disordered adolescents, and specifically those with BN symptoms. Clinicians should also be informed that in line with these findings, trauma may have less relation to AN in adolescents. Our data also highlights the connection of two experiences bereft of control, trauma and binge eating. Thus, therapists may find these results clinically important and useful in informing their conceptualization and treatment approach. Moreover, techniques related to increasing a sense of self-control might be helpful in treating BN. In addition, it might also be helpful to think about the treatment of BN as more than only a focus on ED symptoms, as past traumatic experiences seem relevant in the treatment of BN, binge eating and compensatory behaviors. Therefore, a treatment focus that explores an ED patient's sense of self and relation to others related to both prior trauma as well as their current symptomatology seems warranted. Additionally, that clinicians become more aware of the role control, or lack thereof, plays in trauma and EDs. It will be important to gain a deeper understanding of treatment approaches that most benefit eating disordered adolescents with a history of poly-trauma experiences.

Compliance with Ethical Standards

Disclosure of Interest All authors declare that they have no conflicts to report.

Ethical Standards and Informed Consent All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation [institutional and national] and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all patients for being included in the study.

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