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Post-traumatic stress symptoms in parents of adolescents hospitalized with Anorexia nervosa

C. Alix Timko^{a,b}, Nicholas J. Dennis^c, Connor Mears^a, Daniel Rodriguez^d, Kathleen Kara Fitzpatrick^e, and Rebecka Peebles^{f,g}



^aDepartment of Child and Adolescent Psychiatry and Behavioral Sciences, Children's Hospital of Philadelphia, Philadelphia, Pennsylvania, USA; ^bDepartment of Psychiatry, Perelman School of Medicine at The University of Pennsylvania, Philadelphia, Pennsylvania, USA; ^cDepartment of Psychiatry, Robert Wood Johnson Medical School, Rutgers University, New Brunswick, New Jersey, USA; ^dDepartment of Public Health, LaSalle University, Philadelphia, Pennsylvania, USA; ^ePrivate Practice, Palo Alto, California, USA; ^fCraig Dalsimer Division of Adolescent Medicine, Children's Hospital of Philadelphia, Philadelphia, Pennsylvania, USA; ^gDepartment of Pediatrics, Perelman School of Medicine at University of Pennsylvania, Philadelphia, Pennsylvania, USA

ABSTRACT

The current study was a planned secondary analysis to examine post-traumatic stress symptoms (PTSS) in parents of youth hospitalized for medical stabilization due to anorexia nervosa (AN). Questionnaires were administered to 47 parents (34 mothers, 13 fathers; 10 parental dyads) after admission; follow-up occurred at discharge and 4 weeks, 3 months, and 6 months post-discharge. PTSS were present in the majority of mothers (55.9%) and fathers (61.5%). PTSS were not associated with illness severity, but were associated with parental report of mood symptoms, avoidance, inflexibility, and symptom accommodation. Parental PTSS may negatively impact the adolescent rate of weight gain post-discharge. As hospitalization of a child for medical management of AN can be a traumatizing experience for parents, astute attention should be paid by medical staff to their needs. More work needs to be done to understand the impact of PTSS on parents of adolescents with AN.

Clinical implications

- Post-traumatic stress symptoms (PTSS) are found in parents of youth with anorexia
- PTSS are associated with parental distress and symptom accommodation
- Elevated PTSS during their child's hospital stay may impact rate of weight gain
- PTSS in parents of youth with anorexia need further exploration

CONTACT C. Alix Timko  timkoc@chop.edu  Children's Hospital of Philadelphia, Roberts Center for Pediatric Research, 2716 South Street, 8-212, Philadelphia 19146, Pennsylvania, USA

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Introduction

The hospitalization and diagnosis of a child with a severe illness or injury can be traumatic for many parents (Muscara et al., 2018; Pinquart, 2019; Woolf et al., 2016). Following discharge from a Pediatric Intensive Care unit, between 10% and 42% of parents meet symptom thresholds for a likely post-traumatic stress disorder (PTSD) and 18% and 62% experience subclinical levels of post-traumatic stress symptoms (PTSS; Yagiela et al., 2019). Evidence suggests that the perceived or subjective impact of a medical condition (e.g., worry that their child might die), not the objective severity (e.g., duration of illness), predicts PTSS in parents (Balluffi et al., 2004; Norberg et al., 2012; Stuber & Shemesh, 2006). Psychiatric disorders are also associated with parental PTSS; data indicate that many caregivers of individuals with Autism Spectrum Disorder (Casey et al., 2012), psychosis (Kingston et al., 2016; Loughland et al., 2009), and schizophrenia (Kageyama & Solomon, 2018) meet criteria for PTSS or are at risk for PTSD.

Anorexia nervosa (AN) presents a unique case in both medical and psychiatric PTSS risk, as it is a life-threatening psychiatric disorder with severe medical complications (Peebles et al., 2017). Hospitalization for medical stabilization¹ occurs in approximately 68% of adolescent patients (Peebles, et al., 210), and nearly half require at least one readmission (Steinhausen et al., 2008). They are at increased risk for self-harm and suicidal behaviors (Kostro et al., 2014). It is possible that parents of youth with AN experience a high degree of trauma symptoms,² particularly in a hospital setting (Balluffi et al., 2004; Franck et al., 2015; Stremmler et al., 2017; Stuber & Shemesh, 2006). If present, parental PTSS could conceivably interfere with implementing and adhering to treatment protocols. For example, a parent with higher PTSS might avoid conflict and accommodate eating disorder (ED) symptoms (Fox & Whittlesea, 2017) out of fear that confrontation about food and eating might cause the child to restrict (Vidović et al., 2005). To our knowledge, there is no published literature on the impact of PTSS on caregiver burden, caregiver fatigue, symptom accommodation, or implementation of treatment strategies in parents of adolescents with AN.

This study examined trauma symptoms in parents of adolescents with AN hospitalized for medical stabilization. The primary goal was to determine if PTSS were present and whether they correlated with documented moderators of outcome. We hypothesized that parents would report moderate levels of PTSS and that PTSS would be positively correlated with length of illness, severity of AN symptoms, higher parental anxiety, increased symptom accommodation, greater avoidance, and less flexibility. We also sought to explore whether or not PTSS, if present, would impact weight gain after discharge.

Methods

Procedure

Participants were 47 parents (34 mothers 13 fathers; 10 of whom were a dyad) who had a child hospitalized for medical stabilization due to malnutrition in the context of anorexia nervosa. Data were collected as part of a pilot and feasibility study unrelated to PTSS; full methods are described elsewhere (Timko et al., 2020, 2018). We included a measure of PTSS specifically to determine whether or not elevated symptoms were reported by parents whose child was hospitalized for medical stabilization in the context of anorexia nervosa. There were no specific inclusion or exclusion criteria for parents (other than having a child with anorexia nervosa hospitalized for medical stabilization). Adolescents met inclusion criteria if they were 10–20 years old, diagnosed with AN, and hospitalized for medical stabilization. Gathering data on traumatic stress in parents to determine if PTSS were present was an a priori goal of this study.

Parents completed a battery of questionnaires at five time points: within the first week of their child's hospital stay, at discharge, and 4 weeks, 3 months, and 6 months after discharge. Baseline data were collected between days 2 and 5 of the hospital stay, and weight data were collected at each time point. Informed consent from all participants was provided, and all procedures were approved by the hospital's human subject's review board.

Assessment measures

All measures included in this study were completed by parents. Given the small number of fathers, internal consistency reliability (α) was only calculated for mothers, although all measures are documented to have good reliability and validity. The primary outcome measure was the Impact of Event Scale-Revised (IES-R; Weiss, 2007). The IES-R is a 22-item measure that assesses perceived PTSS in response to a specific event. It has a total score ($\alpha = .93$), three subscales Intrusion ($\alpha = .88$), Avoidance ($\alpha = .86$), and Hyperarousal ($\alpha = .79$). Instructions for the IES can be altered to fit specific events; parents were asked to answer the questions focused on the current hospitalization.³ Scores above 24 on the IES-R indicate that PTSS are present (Asukai et al., 2002) and scores above 33 indicate a likely diagnosis of PTSD (Creamer et al., 2003). We assessed parental accommodation of eating disorder behaviors using a revised version of the Accommodation and Enabling Scale for Eating Disorders-Revised (AESED-R) (Sepulveda et al., 2009; Timko & Fitzpatrick, 2016), $\alpha = .91$. Expressed emotion was assessed with the Family Questionnaire (FQ) (Wiedemann et al., 2002); it has two scales: Critical Communication ($\alpha = .78$) and Emotional Overinvolvement ($\alpha = .68$). Parental flexibility ($\alpha = .84$) and attention to detail ($\alpha = .90$) were assessed with the Detail and Flexibility Questionnaire (DFlex)

(Roberts et al., 2011), and experiential avoidance with the Acceptance and Action Questionnaire-II ($\alpha = .78$) (AAQ-II) (Bond et al., 2011). The Depression Anxiety Stress Scale (DASS-21; Lovibond & Lovibond, 1995) assessed for parental mood ($\alpha = .91$). Eating disorder symptoms were assessed via the Anorectic Behavior Observation Scale (ABOS) (Vandereycken, 1992), $\alpha = .0796$.

Analysis

We examined the relationship between PTSS and other variables of interest separately for mothers and fathers; we hypothesized that there may be sex differences in the degree of PTSS experienced. As this was an exploratory study, we examined total scores on the IES, as well as the subscales. We utilized simple correlations. A priori power analysis indicated that using a one-tailed test and assuming a medium effect size ($r = .30$, $\alpha = .05$, power = .80), a sample of 64 was needed in order to be fully powered; a large effect would need a sample of 21. As the primary study recruited a total of 47 parents, we were under-powered for the primary correlational analysis. However, we felt that these are important preliminary data to inform future hypotheses for prospective data collection. We used latent growth curve modeling (LGCM) to examine changes in maternal PTSS over time and to determine if there was any impact of maternal PTSS on BMI trajectories after discharge. Given sample sizes, we focused on mothers for these analyses.

To assess model fit, we employed standard fit criteria including chi-square, Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). The chi-square test assesses how well the model generated variance and covariance matrix (covariance matrix) fit the observed covariance matrix, with smaller differences indicating better fit (Schreiber et al., 2006; Sivo et al., 2006). The remaining fit indexes take model complexity into account, favoring less complex models (parsimony). Standard heuristics for acceptable fit include a non-significant chi-square, $CFI \geq 0.95$, $RMSEA < 0.08$, and $SRMR \leq 0.08$. Models were also checked for negative variances (Heywood cases). These were constrained to equal zero if the negative variances were not significant (i.e., $p > 0$).

Results

Demographics

Average age in mothers was 42.9y (SD = 5.9) and 45.6y (SD = 6.8) in fathers. Race and ethnicity information for parents was limited; 90% of mothers and fathers reported not being Hispanic or Latina/o. Adolescents were $14.8 \pm 2.4y$ with a range of 10.2–19y. The average BMI z-score for adolescents was

-1.3 ± 1.3 ; the majority (89.2%) were severely malnourished by published pediatric criteria (Peebles & Sieke, 2019). Just over a quarter of the sample (27%, $N = 10$) of adolescents had been hospitalized for medical stabilization before. The majority of adolescents (70.3%) discharged to FBT ($N = 28$, 75.7%), with three (8.1%) receiving individual care, two (5.4%) opting for no behavioral health follow-up, and the remaining 4 seeking higher level of care for treatment (10.8%).

Correlations

Most parents (55.9% of mothers and 61.5% of fathers) scored above 24 on the IES-R at baseline. Neither parents' total nor subscale IES-R scores were correlated with any physical indicator of child illness, including child's age, length of illness, amount of weight lost, BMI z-score, and % of goal weight. Mothers' IES-R, hyperarousal subscale, and avoidance subscale were all moderately correlated with the ABOS; fathers' were not (Table 1). Maternal and paternal total IES-R was correlated with total DASS; however, there was a different pattern of associations between subscales of the different measures for each group of parents (see Table 1). Maternal, but not paternal, PTSS were correlated with accommodation of ED symptoms. Maternal intrusion was correlated with inflexibility; paternal PTSS was not. Maternal intrusion was correlated with experiential avoidance, whereas paternal experiential avoidance was associated with total IES-R and both avoidance and intrusion scales. Neither maternal nor paternal expressed emotion correlated with the IES-R or its sub-scales.

LGCM

Sample size affects the estimation of model fit indexes, and our sample size was limited (Schreiber et al., 2006). Given that LGCM models represent the best fitting models to the data based on the mean level change across time, the results of these analyses should be used to estimate selected effects rather than as an indicator of the optimal model (linear or quadratic) to fit the data. We focus on interpreting effects more than model fit. Due to the small number of fathers providing data, we focused the analyses on mothers; we provided a graphical depiction of the change in fathers' PTSS over time (Figure 1). For mothers, we included data from baseline, one-month post-discharge, and six months post-discharge in this analysis (although a 3-month follow-up is included in Figure 1). This maximized available data as some was lost to follow-up. Full fit statistics are presented in Supplementary Table 1; baseline and linear trend means for all scales are presented in Supplementary Table 2.

There was an overall significant decline from baseline for the total scale ($B = -4.309$, $z = -3.141$, $p = .002$) and intrusive symptom's ($B = -2.024$, $z = -6.267$, $p < .001$). There was a significant decline in hyperarousal from

Table 1. Correlations of study variables at baseline.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. IES-I	–														
2. IES-H	.837**	–													
3. IES-A	.391*	.563**	–												
4. IES Total	.876**	.927**	.762**	–											
5. ABOS	.201	.301*	.291*	.306*	–										
6. AAO	–.145	–.298*	–.229	–.255	–.051	–									
7. AESED	.362*	.384*	.468**	.476**	.584**	.222	–								
8. DFLEX-CR	.291	.343*	.016	.251	.202	–.361*	.354*	–							
9. DFLEX-AD	.171	.277	.087	.205	.363*	–.422**	.344*	.843**	–						
10. DASS	.388*	.510**	.280	.453**	.186	–.652**	.363*	.492**	.464*	–					
11. DASS-D	.416**	.524**	.249	.457**	.018	–.486**	.231	.423**	.389**	.913**	–				
12. DASS-A	.260	.350*	.242	.328*	.190	–.766**	.382*	.432*	.428*	.900**	.705**	–			
13. DASS-S	.393*	.529**	.281	.462**	.289*	–.566**	.386*	.501**	.464**	.954**	.827**	.798**	–		
14. FQ-CC	.054	.035	.136	.092	.170	.243	.084	–.015	.020	.113	.118	.075	.124	–	
15. FQ-EOI	–.188	–.165	–.103	–.176	.365	–.211	–.015	.156	.221	.134	.064	.147	.163	.498**	–

Note: Maternal correlations are in the bottom half of the table and paternal correlations are on the top half. Full labels for all variables are listed below.

*Correlation is significant at the 0.05 level

**Correlation is significant at the 0.01 level

1. Impact of Events Scale (IES) Intrusion 2. IES Hyperarousal; 3. IES Avoidance; 4. IES Total; 5. Anorectic Behavior Observation Scale Total Score; 6. Acceptance and Action Questionnaire Total Score; 7. Accommodation and Enabling Scale for Eating Disorders Score; 8. Detail and Flexibility Questionnaire (DFLEX) Cognitive Rigidity; 9. DFLEX Attention to Detail; 10. Depression Anxiety Stress Scale (DASS) Total 11. DASS Depression; 12. DASS Anxiety; 13. DASS Stress; 14. Family Questionnaire (FQ)—Critical Communication; 14. FQ—Emotional Overinvolvement

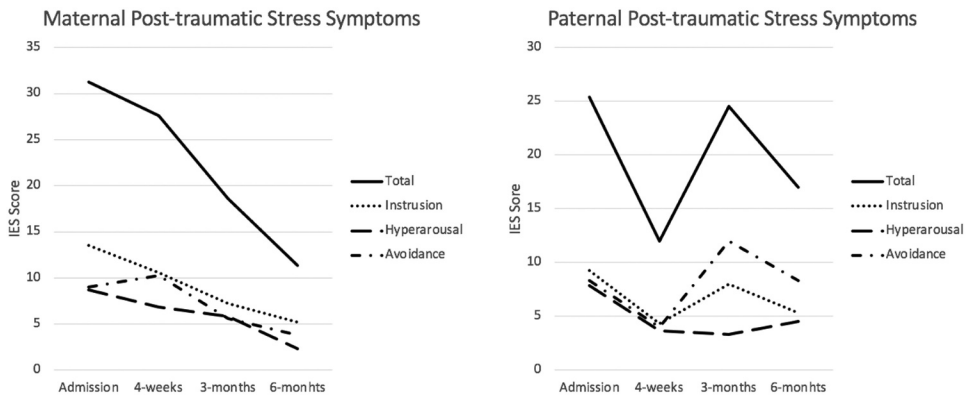


Figure 1. Changes in parental PTSS over time.

baseline ($B = -1.199$, $z = -3.549$, $p < .001$). Given the fluctuation seen in [Figure 1](#), a linear model is the best option for this subscale. For avoidance, the sample means suggest a quadratic trend; however, a linear trend was used to avoid a just identified model, given only one degree of freedom remaining with the linear trend model. There was an overall decline in avoidance from baseline ($B = -0.981$, $z = -1.707$, $p = .088$). It appears that mothers' PTSS symptoms decline in a linear fashion after their child's discharge from hospital. The potential exception is avoidance, which may exhibit a slightly different pattern.

To explore whether maternal levels of PTSS impact the adolescent's rate of weight gain over time, we collapsed the PTSS scores into two categories: no PTSS reported (0) and PTSS reported (1). The results of this analysis were not statistically significant for either a linear ($B = -0.127$, $SE = 0.14$, $z = -0.906$, $p = .365$) or quadratic relationship ($B = 0.023$, $SE = 0.023$, $z = 0.973$, $p = .331$). Examination of [Figure 2](#) reveals that weight gain in adolescents was similar while in hospital. After discharge, adolescents whose mothers reported few PTSS had a steady weight gain to a mean BMI Z-score of 0 by 4 weeks post-discharge and then stabilized. Adolescents whose mothers reported PTSS symptoms took an additional two months to reach a mean BMI Z-score of 0 before stabilization.

Discussion

This planned secondary study is the first to describe PTSS in parents of adolescents hospitalized for medical stabilization secondary to AN, examine its associations with constructs relevant in other medical or psychiatric conditions, and link it to adolescent weight gain post-hospitalization. PTSS were common at baseline and present in over half of mothers and fathers in our sample. Approximately 50% of mothers and 30% of fathers with elevated PTSS

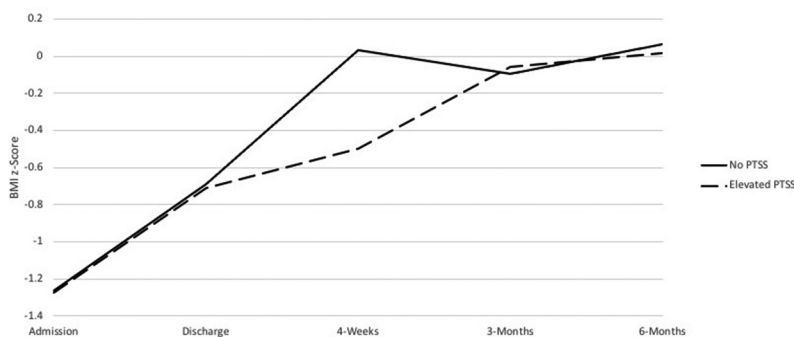


Figure 2. Change in adolescent BMI z-score over time by level of traumatic stress (none or elevated) reported by mothers.

symptoms scored high enough to indicate a likely clinical diagnosis of Acute Stress Disorder. While higher parental PTSS were not associated with greater disease severity in children, there was a significant relationship between maternal report of ED behaviors and trauma symptoms in mothers. Adolescents whose mothers reported greater PTSS at baseline took three times as long to restore weight after discharge, suggesting that parental PTSS may impact successful implementation of home-based protocols. Importantly, PTSS were associated with greater symptom accommodation, which could have impacted outpatient weight gain. More research is needed to see if these associations hold.

Parental IES-R scores were more prevalent in this sample compared to other examined physical conditions (Yagiela et al., 2019). Future studies should examine how these levels of trauma impact parental uptake of new information and how it may impact the course of treatment. Given that weight gain during the first four weeks of AN treatment is predictive of reaching remission (Doyle et al., 2010), it is important to understand whether caregiver PTSS after discharge impacts early treatment success. Evidence is mixed as to whether PTSS in parents are associated with treatment non-adherence in other conditions (Farley et al., 2007; Pinquart, 2019). It is possible that in the context of AN, PTSS could diminish parental self-efficacy after discharge, leading to a slower rate of initial weight gain. Increased parental self-efficacy could serve as a protective factor from PTSS during and after hospitalization.

Literature on other medical conditions indicates that measures of illness factors such as severity and duration may be less influential than perceived severity or subjective worry in predicting PTSS (Balluffi et al., 2004; Norberg et al., 2012; Pinquart, 2019; Yagiela et al., 2019). It is possible that some aspects of a hospital stay could increase subjective concern such as the need for telemetry, nasogastric feeds, and frequent lab monitoring for refeeding syndrome. Levels of PTSS may also be associated with how unexpected the

hospitalization was. Myriad other factors may impact how parents experience a child's hospitalization, including their own history of trauma or current/past mental health, financial burden, missing work/unemployment, needing to care for other children, parental social support, and parental coping styles (Franck et al., 2015; Stremmer et al., 2017).

Future work should explore parent perceived severity of illness and worry regarding their child's hospitalization in assessing PTSS, including the specific type of symptoms endorsed. Additional research should also examine whether the type of treatment (outpatient versus inpatient, family-based versus individual) after discharge mitigates the impact of hospitalization on parent traumatic stress. Studies show that fathers experience elevated PTSS and factors associated with these symptoms, which might differ from mothers. It is thus imperative to continue to include both fathers and mothers in future research (Bronner et al., 2010; Carmassi et al., 2018). Developing evidence-based support for parents in hospital and in the first month(s) post-discharge needs to occur.

Limitations

This was a planned secondary analysis and was wholly exploratory in nature. The sample size was limited by the primary study, and we had a differential drop-out across follow-up. We were underpowered to answer some questions definitively; results should be interpreted in light of this being a novel preliminary investigation that highlighted important patterns, which could generate hypotheses for future studies. However, these limitations are mitigated by the novel nature of the data, including both maternal and paternal data.

Conclusion

To our knowledge, this is the first exploration of PTSS in mothers and fathers of children suffering from AN. The sample size is small, but provides preliminary data indicating that parents do experience PTSS, that these symptoms are correlated with mood, avoidance, accommodation, and less flexibility in mothers, and that PTSS appear to reduce over time. Data suggest a differing trajectory for fathers' PTSS; this requires verification in a larger longitudinal sample. While this study focused on parents of hospitalized children, we need to determine if parents who receive a diagnosis and treatment in an outpatient setting also experience trauma and whether this impacts treatment course. Furthermore, parental trauma may differ across multiple levels of care. Objective markers of illness alone may not adequately identify caregivers who need extra support to help their child reach remission/recovery. Research designed to understand when parents of children with AN

experience trauma symptoms, how this impacts care, and how best to support parents is sorely needed. PTSS in parents of youth with AN are a highly relevant area in need of attention.

Notes

1. Anorexia nervosa is a condition with potentially life-threatening complications that can adversely impact every major organ system—including but not limited to cardiac arrhythmias, electrolyte imbalances, hypoglycemia, osteoporosis, gastroparesis, esophageal rupture, grey and white matter atrophy, hypogonadism, and hepatic enzyme elevations (Peebles & Sieke, 2019).
2. Trauma symptoms include, but are not limited to: distressing memories, psychological distress, self-blame, persistence of negative emotions (such as guilt or self-blame for the eating disorder), hypervigilance, sleep disturbance, avoidant behavior, irritability, problems with concentration, etc.(American Psychiatric Association, 2013). What symptoms are more common or more severe for parents of a child hospitalized for medical management of anorexia nervosa is currently unknown.
3. For this study, the directions read “Below is a list of difficulties people sometimes have after stressful life events. While answering this questionnaire please think about your child’s illness or recent hospitalization. Please read each item and indicate how distressing each difficulty has been for you during the past SEVEN days with respect to your child’s eating disorder.”

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ORCID

C. Alix Timko  <http://orcid.org/0000-0002-2927-7527>

Rebecka Peebles  <http://orcid.org/0000-0001-9360-8434>

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