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Post-traumatic stress symptoms as a predictor of treatment outcomes in a partial hospital program

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Abstract

Introduction: Post-traumatic stress symptoms (PTSS) have been shown to negatively impact treatment outcomes in outpatient settings, but few have investigated in acute settings, such as partial hospital programs (PHP). The present study examined how PTSS may influence treatment outcomes— depression, anxiety, overall functioning— among patients attending a PHP.

Methods: 1298 (Female $n = 728$) adults underwent standard transdiagnostic treatment at a PHP in which patients attend the day-long program for approximately 2 weeks for stabilization primarily focused on mood and anxiety symptoms. We utilized previously validated questionnaires to measure PTSD severity (PCL-5), anxiety (GAD-7), depression (PHQ-9), and overall functioning (WSAS). Linear regression analyses were conducted to determine the degree of improved symptoms and functioning across three trauma groups: patients with no trauma history, patients with trauma exposure, and patients who had severe PTSS.

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Authors note

This analysis was preregistered and can be found here: <https://archive.org/details/osf-registrations-wvupg-v1>

CRedit authorship contribution statement

Grace C. George: Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Conceptualization. **Kaitlyn R. Gorman:** Writing – review & editing, Writing – original draft, Conceptualization. **Antonia V. Seligowski:** Writing – review & editing, Methodology, Conceptualization. **Erin E. Beckham:** Writing – review & editing, Conceptualization. **Kailyn Fan:** Writing – review & editing, Visualization, Conceptualization. **Thröstur Björgvinsson:** Writing – review & editing, Funding acquisition, Data curation, Conceptualization. **Courtney Beard:** Writing – review & editing, Supervision, Methodology, Funding acquisition, Formal analysis, Conceptualization.

Declaration of competing interest

Authors have no known conflict of interest to disclose.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jadr.2024.100811.

Results: Patients in the PTSS group were more likely to endorse higher depression and anxiety symptoms, as well as functional impairment at admission. Severe PTSS, not trauma exposure, predicted less improvement of depression, anxiety, and overall functioning at discharge.

Limitations: Due to the nature of the private hospital, results may not generalize to a wider clinical population. Further, we were unable to test any potential mechanisms because the current naturalistic treatment study relied on a deidentified clinical database that was not designed with these research questions.

Conclusions: Severe PTSS above and beyond anxiety and depression symptoms potentially serve as predictors of treatment outcomes in acute psychiatric settings such as PHPs, further emphasizing the need for enhanced trauma-informed care.

Keywords

Posttraumatic stress symptoms; Partial hospital; Trauma exposure; Treatment outcome

1. Introduction

Lifetime trauma exposure affects up to 90 % of the general population and may lead to development of posttraumatic stress disorder (PTSD, Kilpatrick et al., 2013). The risk of PTSD increases for people with pre-existing mental health diagnoses, such as major depressive disorder (36 %; Campbell et al., 2007). Given this increased risk, it is unsurprising that patients in intensive treatment settings, such as partial hospitals, have been found to be twice as likely to meet criteria for PTSD (Forgeard et al., 2018). However, despite this increased prevalence, little research has been done to understand the impact post traumatic stress symptoms (PTSS) on patient outcomes in acute care.

A recent meta-analysis identified a lack of research on the impact of trauma on services in hospitalization units (O'Dwyer et al., 2021). In this review, only 8 studies from 1998 to 2018 were identified and only two were in the United States. Further, these studies and others focused on providers (i.e. nurses), and not on patient psychiatric outcomes. Most studies on PTSD outcomes are at trauma centers specifically for trauma accidents, not in mental health settings (Sinkler et al., 2022). To date, there is a dearth of research that focuses on PTSS in acute care settings.

To address this knowledge gap, we examined the impact of PTSS on treatment outcomes in a partial hospital program (PHP). PHPs provide an intensive, brief (e.g., 2 week) structured day program that allows patients to return home. PHPs serve as a bridge between inpatient and outpatient care and may help transition people from inpatient to outpatient care, to help decrease the duration of inpatient care, or avoid inpatient care ("Definition of partial hospitalization," 1990). PHPs are often transdiagnostic, do not focus on trauma, and typically provide both group therapy and medication management.

The current study aimed to explore the impact of trauma on treatment outcomes. Specifically, we tested for differences in depression, anxiety, and overall functioning among three groups: 1) patients with no trauma history (NT), 2) patients with trauma exposure and subclinical PTSS (TE), and 3) patients with a trauma exposure and severe PTSS

(PTSS). We predicted that the PTSS group will have higher rates of depression, anxiety, and overall functioning at admission and less improvement of symptoms at discharge. For our exploratory analyses, we tested how gender identity interacted with severe PTSS to predict the same symptoms at discharge. Finally, we examined if patients with severe PTSS had worse perceptions of care due to experiencing less symptom improvement.

2. Methods

2.1. Participants and setting

Participants ($N = 1298$) were patients receiving treatment at a New England PHP at an insurance-based, academic psychiatric partial hospital from 2016 to 2022. Patients attending this PHP were English-speaking adults (ages 18), who received intensive, brief CBT- and DBT-based and pharmacological treatment with the goal of stabilization of symptoms and return to outpatient care. Presenting problems were primarily mood, anxiety, psychotic, and personality disorder symptoms, as well as suicidal ideation (see Forgeard et al., 2018 for an overview of the PHP, and Beard et al., 2016 for a description of eligibility and patient population). Approximately half of patients were referred from full-time inpatient care and half from outpatient care. Patients attended (Monday-Friday) up to five 50-minute-long group therapeutic sessions daily and two to three individual sessions per week. Group treatment focused on teaching evidence-based skills validated treatment manuals (e.g., behavioral activation, distress tolerance). Self-reported intake demographics can be found in Table 1.

2.2. Study design

This study was deemed exempt by the IRB due to the use of a deidentified dataset collected as part of routine clinical care. This secondary analysis was pre-registered (George et al., 2022). As part of standard care at the PHP, participants completed self-report progress monitoring symptom measures via REDCAP each day of treatment, however, we are only using measures from admission and discharge (Harris et al., 2009). Participants who completed the PTSD severity measure (*PCL-5*) were included in the present analysis.

2.3. Measures

2.3.1. Posttraumatic stress disorder checklist for DSM-5 (PCL-5)—The 20 item self-report PCL-5 (Weathers et al., 2013) was used in this study to assess PTSS severity and to obtain symptom cluster scores. The PCL-5 is a well-validated measure (Bovin et al., 2016), with scores ranging from 0 to 80. Patients were asked if they endorsed Criterion A, if they did, they were given the rest of the PCL-5, if not, they were put in the control group. For those who did endorse Criterion A, a cut off score of 31 was used to indicate severe PTSS, scores between 1 and 31 were assigned to the trauma exposed group (Bovin et al., 2016). Internal consistency for the sample was $\alpha = 0.94$.

2.3.2. Generalized anxiety disorder –7 item scale (GAD-7)—Anxiety symptoms were measured using the GAD-7 (Spitzer et al., 2006). This brief self-report questionnaire and has been previously validated in the same partial hospital population (Beard and Björgvinsson, 2013). We used the standard GAD-7 for admission, and a modified version

asking about the past 24 h for discharge. The modified version of the GAD-7 was previously validated in a similar sample (Beard and Björgvinsson, 2014). Internal consistency at admission and discharge was $\alpha = 0.89$.

2.3.3. Patient health Questionnaire- 9 item (PHQ-9)—Depression severity was measured using the PHQ-9 (Kroenke et al., 2001). This 9-item self-report measure has previously shown good psychometric properties in the same partial hospital population (Beard et al., 2016). We used the standard PHQ-9 for admission, and a modified version asking about the past 24 h for discharge. Internal consistency at admission was $\alpha = 0.86$ and $\alpha = 0.87$ at discharge.

2.3.4. Work and social adjustment scale (WSAS)—Overall functioning was assessed using the WSAS which measures degree of functional impairment. It is a 5-item questionnaire that has previously shown to be reliable and valid in people diagnosed with numerous disorders (Mundt et al., 2002). Internal consistency at admission was $\alpha = 0.83$ and $\alpha = 0.88$ at discharge.

2.3.5. Perceptions of care (POC)—POC was assessed using a survey created for inpatient psychiatric treatment (Eisen et al., 2002). We used one item, “Using any number from 1 to 10, what is your overall rating of the care you received in the program?”, to assess patients’ evaluation of their care.

2.4. Data analytic strategy

All analyses were conducted in RStudio (RStudio Team, 2012). We used descriptive statistics to quantify the prevalence of lifetime trauma exposure and current PTSS severity. Subsequently, we used regression analyses to compare differences in depression, anxiety, and overall functioning upon admission and discharge among three groups: 1) no trauma history (NT), 2) trauma exposure but not severe PTSS (TE), and 3) trauma exposure and severe PTSS (PTSS). We then examined the impact of PTSD symptom (B-E) criterion on treatment outcomes. Analyses of discharge outcomes controlled for baseline levels of depression, anxiety, and overall functioning based on admission scores as well as gender identity and age. We conducted an FDR correction on all linear models. Pairwise *t*-tests with Tukey correction were then conducted for significant 3-group models. For exploratory analyses, we investigated if gender identity moderated group differences at discharge (gender identity x PTSS group) to predict symptom outcomes. Lastly, we examined if PTSS group predicted perception of care while controlling for age and gender. This final analysis was not in our original preregistration.

3. Results

Table 1 presents demographic comparisons between NT, TE, and PTSS patients. Of the 1298 patients who completed the PCL-5 screener, 64.9 % reported experiencing or witnessing a traumatic event in their lifetime. Among those with reported past trauma, 43.2 % patients reported significant PTSS in the past month, as defined by a PCL-5 score of 31 or greater. Across trauma groups, there were relatively no differences in age, race/ethnicity, educational

level, or employment status. However, there were significant group differences in gender identity, history of homelessness, and sexual orientation (Table 1).

3.1. Primary analyses

We found no significant outliers using a grubbs test in RStudio using the *outliers* package (Komsta, 2022). At admission, the PTSS group had higher symptoms of depression, $b = 2.07$, $F(2, 1294)=91.46$, $p_{\text{fdr}}<0.001$; anxiety, $b = 1.91$, $F(2, 1294)=105.32$, $p_{\text{fdr}}<0.001$; and worse overall functioning, $b = 2.35$, $F(2, 1294)=67.04$, $p_{\text{fdr}}<0.001$, than the NT and TE groups ($p_{\text{fdr}}<0.001$). At discharge, the PTSS group had higher depression symptoms, $b = 0.62$, $F(2, 1293)=15.4$, $p_{\text{fdr}}<0.001$, compared to the NT and TE groups ($p_{\text{fdr}}<0.001$) (Fig. 1a). For anxiety, the PTSD group had higher symptoms at discharge, $b = 0.67$, $F(2, 1293)=24.77$, $p_{\text{fdr}}<0.001$, compared to the NT and TE ($p_{\text{fdr}}<0.001$) groups (Fig. 1b). For overall functioning, the PTSS group had worse functioning at discharge, $b = 0.74$, $F(2, 1293)=8.63$, $p_{\text{fdr}} = 0.006$, compared to NT and TE groups ($p_{\text{fdr}} < 0.001$) (Fig. 1c). The NT and TE groups did not differ on any model ($p_{\text{fdr}} > .05$). See Supplementary Table 1 for full statistics.

As a preregistered hypothesis, we tested if different PTSD criterion were differentially related to treatment outcomes. We found that subscales B-E predicted depression, anxiety, and overall functioning at discharge similarly, therefore, it will not be further discussed due to space ($p_{\text{fdr}} < 0.01$). Full statistics can be found in Supplementary Table 1.

3.2. Exploratory analyses

We found that there was no significant interaction of gender for depression $F(2, 1292) = 2.25$, $p = .13$, anxiety $F(2, 1292) = 0.73$, $p = .39$, or overall functioning $F(2, 1292) = 0.01$, $p = .89$. We found a significant group difference, $b = 0.13$, $F(3, 1069)=5.99$, $p = .015$, for perceptions of care at discharge; however, contrary to our hypothesis, the PTSS group had the highest perception of care compared to TE and NT groups.

4. Discussion

This is one of the first studies to test PTSS effects on treatment outcomes in a PHP. We found that adults with severe PTSS were more likely to have increased depression and anxiety symptom severity, as well as functional impairment, at hospitalization admission and less symptom improvement at discharge. Importantly, it was not trauma exposure itself, only severe PTSS, that hindered treatment outcomes.

Further, PTSS did not interact with gender identity to predict treatment outcomes. Although there were significant differences between the trauma groups on their perceptions of care, it was in the unexpected direction with the PTSS group reporting the highest quality of care.

These findings suggest important implications for clinicians in acute care settings. Given that PTSS may hinder a patient's ability to improve during PHP treatment, clinicians should consider screening for PTSS in PHPs as this will alert them to the possibility of additional needs. This may lead to increased time in PHP or requiring more intensive treatment, such as inpatient care. Importantly, clinicians should be screening for current PTSS, not merely

trauma exposure. For those patients that have PTSS, PHP care may never be as effective if it does not directly address their needs as PTSS may be driving their other symptoms. Unless specifically listed as a trauma center, most PHPs, deliver non-trauma focused CBT and do not treat PTSS due to the lack of specialized resources and an accelerated timeline (1–2 weeks) compared to more common trauma treatments. Future studies are needed to test the mechanism behind worse outcomes for patients with PTSS in acute hospital settings to improve treatment for this subgroup of PHP patients.

4.1. Limitations

While this study answered an important question about the effect of current PTSS on PHP outcomes, it is not without limitations. First, due to the use of a de-identified clinical dataset, we were limited to self-report quantitative measures. Additional qualitative data would have added more nuance and understanding as to why treatment may not be working as effectively. Second, this PHP is insurance-based and private, therefore the demographics tend to lean towards White, cisgender, and highly educated patients. Thus, our results may not generalize to a wider patient population. Due to the high prevalence of trauma in marginalized groups (Matheson et al., 2019), it is imperative to further study this association.

4.2. Conclusions

In conclusion, we found that severe PTSS, not just trauma exposure, were related to worse treatment outcomes. Given the high prevalence of trauma exposure in these settings, clinicians need to better attend to the potential impact of severe PTSS. Future work should focus on potential reasons why typical PHPs are not as effective for patients with PTSS.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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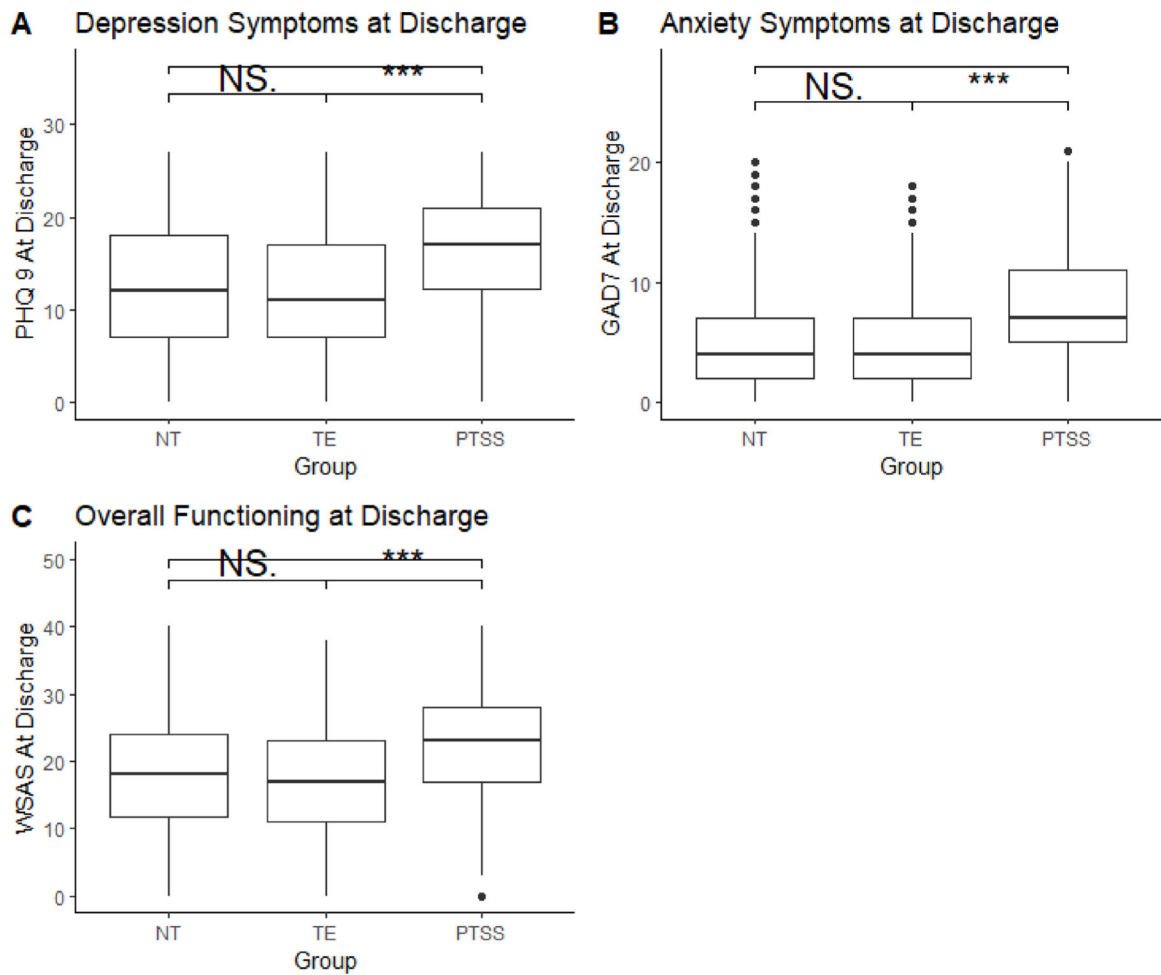


Fig. 1. Significant 3-group difference predicting depression symptoms (A), anxiety symptoms (B), and overall functioning (C) at discharge residualized for symptoms at intake, sex, and age. *** denotes $p < 0.01$.

Table 1

Participant Demographics.

Demographic Variables	No Trauma	Trauma Exposed	PTSS	Group Comparisons
N	455	479	364	
Gender identity	N (%)			
Female	233 (51.2 %)	265 (55.3 %)	230 (63.5 %)	$\chi^2 (2, N = 1298) = 15.38, p = 0.00045$
Male	214 (47.0 %)	204 (42.6 %)	121 (33.2 %)	
Non-Binary	7 (1.5 %)	4 (0.8 %)	10 (2.7 %)	
Transgender	1 (0.2 %)	2 (0.4 %)	1 (0.2 %)	
GenderQueer	0 (0 %)	1 (0.2 %)	0 (0 %)	
Questioning	0 (0 %)	1 (0.2 %)	0 (0 %)	
Sexual Orientation	N (%)			
Bisexual	45 (9.9 %)	70 (14.6 %)	71 (19.5 %)	$\chi^2 (8, N = 1298) = 29.85, p = 0.00022$
Gay/Lesbian	23 (5.0 %)	24 (5.0 %)	23 (6.3 %)	
Heterosexual/Straight	361 (79.3 %)	355 (74.1 %)	231 (63.5 %)	
Queer	20 (4.4 %)	22 (4.6 %)	27 (7.4 %)	
Asexual	3 (0.7 %)	2 (0.4 %)	3 (0.8 %)	
Pansexual	0 (0 %)	1 (0.2 %)	4 (1.0 %)	
Did Not Respond	3 (0.7 %)	4 (0.8 %)	5 (1.3 %)	
Age	M (SD)			
Hispanic and/or Latino/a	N (%)			
White	33.60 (14.57)	35.64 (13.646)	33.71 (12.481)	$\chi^2 (114, N = 1298) = 128.83, p = 0.162$
Black	21 (4.60 %)	31 (6.5 %)	24 (6.6 %)	$\chi^2 (2, N = 1298) = 1.91, p = 0.38$
Asian	394 (86.6 %)	420 (87.7 %)	314 (86.2 %)	$\chi^2 (12, N = 1298) = 8.91, p = 0.71$
American Indian or Alaskan Native	14 (3.1 %)	8 (1.7 %)	14 (3.8 %)	
Native Hawaiian or Pacific Islander	21 (4.6 %)	24 (5.0 %)	15 (4.1 %)	
Mixed	1 (0.2 %)	0 (0 %)	0 (0 %)	
Not Listed	0 (0 %)	0 (0 %)	0 (0 %)	
Education level	N (%)			
Some high school	17 (3.7 %)	16 (3.3 %)	16 (4.4 %)	
High school/GED	8 (1.7 %)	11 (2.3 %)	5 (1.4 %)	
Some college	3 (0.7 %)	0 (0 %)	1 (0.3 %)	$\chi^2 (8, N = 1298) = 8.98, p = 0.344$
4-year college graduate	35 (7.7 %)	25 (5.2 %)	22 (6.0 %)	
	139 (30.5 %)	137 (28.6 %)	111 (30.5 %)	
	127 (27.9 %)	159 (33.2 %)	119 (32.7 %)	

	No Trauma	Trauma Exposed	PTSS	Group Comparisons
Graduate degree	149 (32.7 %)	157 (32.8 %)	110 (30.2 %)	
History of homelessness N (%)	7 (1.5 %)	17 (3.5 %)	27 (7.4 %)	$\chi^2 (2, N = 1298) = 18.77, p = 8.331e-05$
Unemployed N (%)	224 (49.2 %)	202 (42.2 %)	155 (42.6 %)	$\chi^2 (4, N = 1298) = 6.69, p = 0.153$

Table 1. Patient demographic information. Chi-squared tests were conducted to understand differences between groups. Pairwise comparisons were conducted if chi-squared tests were significant. Results from pairwise comparison tests can be found in Results section.