Exploring the Longitudinal Trajectories of Posttraumatic Stress Disorder in Injured Trauma Survivors

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Objective: The goal of this study was to examine the longitudinal trajectories of posttraumatic stress disorder (PTSD) symptoms in a sample of acutely injured hospitalized civilian trauma survivors who participated in a randomized clinical trial. Prior longitudinal descriptive research has shown that there are distinct trajectories of PTSD symptoms over time in trauma survivors. Limited clinical trial research exists that describes the patterns of the trajectories as well as the risk factors that influence the trajectories for seriously injured trauma-exposed patients. *Method:* Semiparametric, group-based approach trajectory modeling was used to examine four group trajectories of a subset of data obtained from a previous longitudinal clinical trial. Trajectories examined included resilience, recovery, relapsing/remitting, and chronic symptom patterns. One hundred and ninety-four patients who participated in the randomized clinical trial were assessed at baseline in the days and weeks after injury and then randomized. The associations between previously identified PTSD risk factors and the four trajectories were examined. *Results:* The risk factors of ethnocultural minority status, psychiatric history, additional life stressors, and depressive symptoms, as well as intervention versus control group status, were found to significantly affect the probability of trajectory group membership for PTSD symptom severity. *Conclusions:* These findings suggest that there is a need for early PTSD interventions that anticipate differences in injured patients' PTSD trajectory profiles. Stepped care intervention procedures may optimally address the diverse PTSD trajectory patterns observed in injured trauma survivors through the tailoring of intervention timing and dosing.

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The lifetime prevalence of posttraumatic stress disorder (PTSD) in the United States is estimated at approximately 6.8% of the population (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Each year approximately 2.5 million Americans are hospitalized after sustaining traumatic physical injuries, and approximately 10% to 40% of those injured individuals will develop PTSD (Bonnie, Fulco, & Liverman, 1999; National Center for Injury Prevention, 2012; O'Donnell, Creamer, Bryant, Schnyder, & Shalev, 2003; Winston, Kassam-Adams, Garcia- España, Ittenbach, & Cnaan, 2003; Zatzick et al., 2007). Physical injuries sustained during potentially traumatic experiences are associated with a higher likelihood of PTSD (Zatzick et al., 2007). In addition, seriously injured trauma-exposed patients who require extended inpatient hospital admission may be at the highest risk for the development of PTSD (Verger et al., 2004; Zatzick et al., 2007). Following a traumatic injury, PTSD and related comorbidities, such as depression, sleep problems, and anxiety, are associated with a wide array of functional, cognitive, and health-related impairments (Bryant et al., 2010; O'Donnell et al., 2009; Ramchand, Marshall, Schell, & Jaycox, 2008; Zatzick et al., 2011, 2013).

Multiple risk factors for the development of PTSD in injured adults have been studied in prior investigations (Bryant, Harvey, Guthrie, & Moulds, 2000; Ehlers, Mayou, & Bryant, 1998; Grieger et al., 2006; Holbrook, Anderson, Sieber, Browner, & Hoyt, 1999; Koren, Hemel, & Klein, 2006; Marshall & Schell, 2002; Mayou, Bryant, & Duthie, 1993; Mellman, David, Bustamante, Fins, & Esposito, 2001; Michaels et al., 1999; Shalev et al., 1998; Zatzick et al., 2007). Greater numbers of prior traumatic life events and higher levels of early posttraumatic distress, demographic characteristics (e.g., female gender, ethnocultural minority status), and other clinical characteristics such as comorbid mental health (e.g., depression) and substance use symptoms have

been identified as posttraumatic stress disorder risk factors. Similarly, individuals with a greater number of prior potentially traumatic (PPT) experiences have a greater chance of developing PTSD (Ramstad, Russo, & Zatzick, 2004). Prior research has shown that there are also distinct trajectories of PTSD symptoms over time in trauma survivors (Bonanno, 2004; Norris, Tracy, & Galea, 2009; O'Donnell, Elliott, Lau, & Creamer, 2007). For example, Orcutt, Erickson, and Wolfe (2004) found that those with low levels of initial symptoms typically remain low over time whereas those with higher levels of initial symptoms may increase over time. Bonanno and colleagues (2004) described four prototypical outcome trajectories after loss or trauma: resilience, recovery, relapsing/remitting, and chronic trajectories. This suggests that there may be certain patterns of symptom trajectories that can distinguish between patients with high resiliency to trauma, or the ability to "bounce back" from the event without difficulty, as well as those who may lack resiliency and, most importantly, those who would benefit most from immediate intervention (O'Donnell et al., 2007; Ramstad et al., 2004). Suggestions have been made to also examine nonlinear patterns of individual change over the course of PTSD treatment (Hayes, Laurenceau, Feldman, Strauss, & Cardaciotto, 2007; Zatzick et al., 2002).

One prior randomized clinical trial study reanalyzed data collected for a novel trajectory analysis (Galatzer-Levy et al., 2013). Beyond this seminal contribution, few studies have investigated patterns of symptom change over time while also examining the risk factors that may affect these patterns (Macdonald, Monson, Doron-Lamarca, Resick, & Palfai, 2011; O'Donnell et al., 2007; Zatzick et al., 2002). This study aimed to examine PTSD symptom trajectories as well as providing an assessment of the risk factors that influence these patterns among injured, hospitalized, civilian trauma survivors who

participated in an early stepped collaborative care intervention trial.

METHOD

Patient Recruitment and Randomization

All study procedures were approved by the University of Washington Institutional Review Board prior to initiation of the project protocol (Zatzick et al., 2013). This study used data that were collected by Zatzick and colleagues (2013) as part of a randomized controlled trial (RCT) of stepped collaborative care for injured trauma patients. The inclusion and exclusion criteria for the trial have been described previously (Zatzick et al., 2011, 2013). Each participant was randomly assigned to either the treatment (intervention, $n = 96$) or the control group (usual care, $n = 98$).

The treatment group received a series of interventions focused on early and sustained care of posttraumatic symptoms. These interventions began with care management (e.g., motivational interviewing, behavioral activation) and then "stepped up" to higher-intensity care (pharmacotherapy). The control group received what is considered to be "care as usual," which included routine physician visits and specialty mental health services. Patients assigned to usual care were encouraged to use all resources available to them. All participants in the study ($n = 194$) received a resource list that included telephone numbers of local mental health and crisis care agencies. The baseline assessment was administered on the surgical ward prior to randomization; patients spent a mean of 9 days in the hospital (SD 10.4) prior to the baseline assessment (Zatzick et al., 2013). A follow-up assessment also occurring before randomization was administered 1–3 weeks after the injury. Patients were again assessed post-randomization at 1, 3, 6, 9, and 12 months after the injury. The percentages of patients missing data were 16%, 23%, 27%, 30%, and 20% for 1, 3, 6, 9, and 12 months respectively. A follow-up rate of ≥ 75% was completed at each time point.

Assessment of Risk Factors

Based on literature review, the following risk factors were chosen for examination in the current investigation: female gender, ethnocultural minority status, household income, living situation, having children, employment status, homelessness, injury type, age at time of injury, education level, injury severity score, pre-injury history of psychiatric visits, abuse as a child, severity of trauma, post-trauma concerns, peritraumatic emotional responses and depression, and alcohol and other substance abuse. Scales and other methods for describing risk factors are enumerated below.

PTSD Symptoms. The PTSD Checklist–Civilian Version (PCL) is a 17-item self-report measure of PTSD that corresponds to the 17 *DSM-IV* symptoms (Weathers, Litz, Herman, Huska, & Keane, 1993). The PCL uses a Likert response (1–5) scale that assesses the intrusive, avoidant, and arousal PTSD symptom clusters. The PCL was used as a continuous measure in the current investigation. The psychometric properties of the measure have been extensively evaluated (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996; Norris & Hamblen, 2004; Orsillo, 2001; Ventureyra, Yao, Cottraux, Note, & De Mey-Guillard, 2002; Weathers et al., 1993).

The subset of data for this study included all participant observations containing a score of 35 or greater on the PCL (Weathers et al., 1993), at baseline in the surgical ward, and a subsequent score of 45 or greater approximately 1–3 weeks after the initial injury. The subsample ($n = 194$) of patients with scores on the PCL of 45 or greater was selected in order to best approximate a

pre-randomization diagnosis of PTSD for the longitudinal cohort (Blanchard et al., 1996).

Peritraumatic Emotional Responses. Peritraumatic emotional responses were assessed with a simple yes or no response to the *DSM-IV* A2 criteria, "When the injury happened, did you feel terrified?" and "When the injury happened, did you feel helpless?"

Prior Traumatic Life Events. Prior traumatic life events were assessed with items from the National Comorbidity Survey (Kessler et al., 2012).

Post-Injury Stressful Traumatic Life Events. Post-injury stressful and concerning life events were assessed with measures previously developed by the study team (Zatzick et al., 2013).

History of Psychiatric Treatment. History of psychiatric treatment was assessed with self-report of previous mental health utilization items derived from the study team's prior work with acute care medical injured patients (Mackenzie et al., 2007; Zatzick et al., 2013).

Depression. The Patient Health Questionnaire-9 (PHQ-9) was used to assess baseline depressive symptoms (Kroenke, Spitzer, & Williams, 2001).

Alcohol and Drug Use. Alcohol diagnoses were derived from the NCS-R diagnostic measures (Kessler et al., 2012). Drug use was screened for using single item assessments (Zatzick et al., 2013).

Injury Severity and Type. International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes were used to ascertain injury severity score (ISS) ratings (Zatzick et al., 2010). Injury type was categorized using E-code criteria into intentional (e.g., assault, gunshots, stabbings) and unintentional injuries (e.g., motor vehicle crashes, falls).

Statistical Methods Overview: The Semiparametric, Group-Based Approach to Posttraumatic Trajectory Assessments

Understanding the development of PTSD symptom trajectories over time is critical to furthering the knowledge of the disorder (Bonanno 2004; Norris et al., 2009). The semiparametric, group-based approach (SGBA) to trajectory modeling is a specialized application of finite mixture modeling that can identify clusters of individuals following similar progressions of a behavior or outcome over time (Jones & Nagin, 2007). Developed by D. S. Nagin of Carnegie Mellon University, the SGBA is based on the nonparametric modeling strategy designed for analysis of repeated measures of dichotomous response data (Nagin, 1999). This method is used to link group membership probability to individual-level characteristics and to help determine whether certain types of individuals have distinct developmental trajectories. Prior commentary has explained how the SGBA can overcome shortcomings in hierarchical linear modeling and latent growth modeling of longitudinal analysis methods (Nagin, 1999). The SGBA assumes that the population is composed of a mixture of distinct groups, defined by developmental trajectory (using a multinomial modeling strategy, with maximum likelihood to estimate the model parameters); this allows for cluster identification and provides the posterior probability of group membership for each participant.

The underlying statistical theory of SGBA (Jones, Nagin, & Roeder, 2001) suggests that when data are suspected of consisting of relatively distinct subgroups, a particular class of parametric density functions, called finite mixture densities, can be used to describe the data (Everitt, Landau, & Leese, 2001). These approaches are useful for modeling unobserved heterogeneity in a population.

In the current investigation, SGBA analyses of maximum likelihood estimation with a censored normal model were performed for the PCL to examine whether

TABLE 1. Participant Demographics

	Usual Care (n = 98)		Intervention (n = 96)		Total (n = 194)	
	n	%	*n*	%	*n*	%
Female	44	44.90	55	57.29	99	51.03
Race						
Caucasian	60	61.22	59	61.46	119	61.34
Black	13	13.27	13	13.54	26	13.40
Hispanic	7	7.14	7	7.29	14	7.22
Native American	3	3.06	3	3.13	6	3.09
Asian or Pacific Islander	3	3.06	2	2.08	5	2.58
Two or More Races	12	12.24	12	12.50	24	12.37
Married/Living with Partner	14	14.29	35	36.46	49	25.26
Has Children	53	54.08	63	65.63	116	59.79
Employment						
Employed	51	52.04	41	42.71	92	47.42
Unemployed	19	19.39	25	26.04	44	22.68
Disabled	13	13.27	20	20.83	33	17.01
Student	9	9.18	2	2.08	11	5.67
Retired	4	4.08	3	3.13	7	3.61
Volunteer	1	1.02	3	3.13	4	2.06
Homemaker	1	1.02	2	2.08	3	1.55
Household Income						
$0–$9999	21		19		40	
$10,000–$19,999	7		10		17	
$20,000–$29,999	10		9		19	
$30,000–$39,999	8	8.16	8	8.33	16	8.25
$40,000–$49,999	5	5.10	5	5.21	10	5.15
$50,000–$99,999	11		7		19	
Over $100,000	2	2.04	9	9.38	11	5.67
Don't Know/Refused	34	34.69	29	30.21	63	32.47
Homeless	7	7.14	11	11.46	18	9.28
Injury Type						
Motor Vehicle Injury[a]	47	47.96	44	45.83	91	46.91
Assault[b]	23	23.47	17	17.71	40	20.62
Fall or Jump	19	19.39	12	12.50	31	15.98
Burn	7	7.14	7	7.29	14	7.22
Sports Injury	3	3.06	4	4.17	7	3.61
Work-Related Injury	1	1.02	4	4.17	5	2.58
Other	3	3.06	3	3.13	6	3.09
	Mean	*SD*	Mean	*SD*	Mean	*SD*
Age	38.09	(12.87)	40.03	(13.34)	39.05	(13.11)
Years of Education	12.98	(1.89)	13.36	(2.54)	13.17	(2.24)
Injury Severity Score	14.10	(10.55)	13.38	(8.95)	13.74	(9.77)

Note. [a]Motor vehicle injury includes automobile crash, motorcycles/ATVs, pedestrian-automobile, and bicycles/scooters. [b]Assault includes gunshot, stabbing, physical assault, and sexual assault.

the study data supported the four outcome trajectories proposed by Bonanno (2004): resilience, recovery, relapsing/remitting, and chronic. Missing data were assumed to be "missing at random" (MAR) (Zatzick et al., 2013).

Each risk factor was compared separately to the trajectory data in a univariate model. In an effort to achieve greater clarity for the trajectory results, odds ratios and 95% confidence intervals for risk factors were calculated. Each odds ratio is in comparison to the resilience trajectory group, which was used as a reference/contrast group for examination of the other three trajectories (recovery, relapsing/remitting, and chronic trajectory groups). Data analyses for this study were conducted using SAS/STAT software, version 9.3, of the SAS System for Windows (SAS, 2010), with the TRAJ add-on (Jones et al., 2001).

RESULTS

Demographics and Clinical Characteristics (Table 1)

Participants ranged in age from 18 to 83 years (M = 39.05, SD = 13.11), with 5 to 20 years of education completed (M = 13.17, SD = 2.24). Gender was almost evenly divided with 94 females (48%) and 100 males (51%). Participant self-identified ethnicity was available for all participants, with 119 classified as Caucasian (61%), 26 as Black (13%), 14 as Hispanic or Latino (7%), 6 as Native American (3%), 5 as Asian or Pacific Islander (2%), and 24 of two or more races (12%). A majority of the participants (n = 145, 75%) were not married or living with a partner, however 60% had at least one child (n = 116). Participant occupation status revealed that 92 were employed at least part-time (47%), 44 were unemployed (23%), 33 were disabled (17%), 11 were students (6%), 7 were retired (4%), 4 were volunteers (2%), and 3 were homemakers (2%). The

median combined annual household income reported was in the category of $40,000–$49,000. The category of $0–$4,999 was the most frequently reported category of combined household income; however, 63 (32.47%) of the participants did not provide this information. Approximately 10% of all participants were homeless (n = 18). Thirty-eight percent of the sample has experienced a traumatic brain injury. The most-often given cause of injury was motor vehicle injury (n = 91, 47%), followed by assault (n = 40, 21%), fall or jump (n = 31, 16%), burn (n = 14, 7%), sports injury (n = 7, 4%), work-related injury (n = 5, 3%), and other injury types (n = 6, 3%).

The vast majority of study participants endorsed peritraumatic emotional responses of fear and helplessness (91%). Slightly fewer than half of the participants (44%) reported drug use that included marijuana, stimulants, or cocaine. The mean depressive symptom severity for all participants in the study was 13.77 (SD = 5.44).

Longitudinal Trajectories

The four trajectory group model revealed quadratic trajectories which were similar to the trajectory patterns previously reported (Figure 1). For the resilience trajectory, PTSD symptoms began low and remained low across time points. The recovery trajectory displayed very high PTSD symptom severity initially with subsequent symptom reduction at later time points. The relapsing/remitting trajectory showed moderate symptoms that varied slightly across time, but stayed relatively moderate. Finally, the chronic trajectory demonstrated high baseline symptom levels that persisted over time.

Approximately 28% of the sample was associated with the resilience trajectory (Table 2). Ten percent of the sample was associated with the recovery trajectory, 35% the relapsing/remitting trajectory, and 27% the chronic trajectory (Table 2).

TABLE 2. Four Group SGBA Trajectories

| | Group | | | | | | | |
| | Resilience | | Recovery | | Relapsing/Remitting | | Chronic | |
	β (SE)	p	β (SE)	p	β (SE)	p	β (SE)	p
Intercept	—	—	−1.00 (0.41)	.02*	−0.25 (0.19)	.34	1.14 (0.13)	.00***
Linear	—	—	3.68 (1.93)	.06	0.04 (0.74)	.22	0.26 (0.62)	.68
Quadratic	—	—	−1.88 (1.53)	.22	−0.06 (0.61)	.53	−0.30 (0.55)	.59
Prevalence	28%		10%		35%		27%	

Note. $n = 194$. $*p < .05$; $**p < .01$, $***p < .001$. SGBA = semiparametric, group-based approach.

The risk factors that were found to significantly affect at least one trajectory group were ethnocultural minority status, history of psychiatric visits, additional life stressors/concerns, and depressive symptoms (Table 3). Members of ethnocultural minority groups had significantly increased odds of membership in the chronic trajectory group (Table 4). Having a history of prior psychiatric visits demonstrated increased odds of recovery trajectory group membership (Table 4). High early depressive symptoms were associated with significantly increased odds of recovery trajectory group membership; similarly, depressive symptoms were associated with an increased odds of chronic trajectory group membership (Table 4). Recurrent life stressors significantly increased the odds of membership in the chronic trajectory, relapsing/remitting, and recovery group trajectories (Table 4).

With regard to intervention versus usual care control group status, the probability of membership in the resilience trajectory group was significantly increased if the participant was randomized into the intervention, $β = 1.59 (0.68)$, $p = .02$ (Table 3). Intervention group status was similarly associated with chronic trajectory group membership, $β = 1.50 (0.64)$, $p = .02$. On the other hand, the probability of membership in the recovery trajectory group was not significantly influenced by the intervention, $β = −0.67 (0.54)$, $p = .21$.

DISCUSSION

This study aimed to examine PTSD trajectories and their patterns of patient outcomes among injured hospitalized civilian trauma survivors who participated in a randomized controlled trial. Prior research has shown that trauma survivors' symptoms demonstrate distinct trajectories over time. Limited information has been provided not only regarding the patterns of these trajectories, but for the risk factors that influence these trajectories as well. Although studies have shown that seriously injured trauma-exposed patients who require extended inpatient hospital care may be at the highest risk for PTSD development (Verger et al., 2004; Zatzick et al., 2007), only one prior randomized clinical trial investigation had reanalyzed data to examine posttraumatic symptom trajectories (Galatzer-Levy et al., 2013). Galatzer-Levy reanalyzed data from a large Israeli early PTSD intervention trial and identified similar, but not entirely overlapping trajectory patterns in the randomized clinical trial sample.

The results of the current investigation corroborate the resilience, recovery, relapsing/remitting, and chronic PTSD symptom trajectories documented in prior investigation (Bonanno, 2004; Norris et al., 2009). Without examination of any risk factors that may influence the trajectories, approximately

TABLE 3. Group Contrasts: Intervention and Significant Risk Factors

| | | Trajectory Group | | | | | | | |
| | | Resilience | | Recovery | | Relapsing/Remitting | | Chronic | |
		β (SE)	p	β (SE)	p	β (SE)	p	β (SE)	p
Intervention	Const	—	—	0.73 (0.51)	.15	1.03 (0.56)	.07	0.24 (0.52)	.64
	Int	—	—	–0.67 (0.54)	.21	–1.59 (0.68)	.02*	–1.50 (0.64)	.02*
Race	Const	—	—	–0.32 (0.41)	.43	0.14 (0.52)	.79	–0.08 (0.39)	.84
	Race	—	—	0.24 (0.46)	.60	–0.36 (0.62)	.56	1.51 (0.59)	.01*
Psych. Hist.	Const	—	—	–3.71 (1.25)	.00	-1.60 (0.52)	.00	–1.40 (0.46)	.00
	Psych	—	—	1.57 (0.67)	.02*	0.58 (0.33)	.08	0.04 (0.32)	.91
Add'l Stress	Const	—	—	1.60 (0.62)	.01	1.73 (0.65)	.01	0.52 (0.65)	.43
	Stress	—	—	1.02 (0.32)	.00**	0.88 (0.29)	.00**	1.69 (0.60)	.01*
PHQ-9	Const	—	—	–2.32 (0.88)	.01	–0.92 (0.36)	.01	–1.86 (0.40)	.00
	PHQ-9	—	—	2.30 (0.86)	.01*	–0.04 (0.54)	.94	1.25 (0.50)	.01*

Note. n = 194. **p* < .05, ** p < .01. Const = constant; Int = intervention; Psych. Hist. = psychiatric history; Add'l Stress = additional life stressors; PHQ-9 = Patient Health Questionnaire. Intervention coded as 1, control group coded as 0; minority coded as 1, race White coded as 0.

one-third of the patients in the study showed a symptom severity pattern which matched a relapsing/remitting trajectory (35%). The second-largest portion of the sample (28%) fell within the resilience trajectory, 27% of the participants fell into the chronic trajectory, and 10% fell into the recovery trajectory.

These findings may suggest that there is a need for effective early interventions that are tailored and timed to the needs of injured patients with specific PTSD trajectory patterns. The objective of the study by Zatzick and colleagues (2013) was to develop and put into practice a stepped collaborative care intervention targeting PTSD and related risk factors, and to examine the influence of early interventions (Zatzick et al., 2013). The findings of this reanalysis of the stepped care trial suggest the intervention may influence trajectory group membership. Results from this comparison support the continued development of stepped collaborative care interventions; trajectory analyses suggest multiple evolving and fluctuating PTSD symptom courses in the early days and weeks after traumatic life events. The current analyses revealed readily identifiable clinical and demographic factors that predicted trajectory group membership. This observation supports the idea that those individuals with a higher burden of risk factors could be targeted for more intense early intervention, while those without significant risk factors may benefit most from a less intensive early treatment plan that monitors symptoms longitudinally (Zatzick et al., 2013).

This investigation has limitations. All participants had a score of 35 or greater on the PCL as an inclusion criterion for the randomized clinical trial. Therefore, these results may not be representative of those with mild PTSD symptoms at baseline (below 35 on the PCL) who go on to suffer moderate to severe symptoms in the following months. Due to this limitation, a "true" late-onset and a "true" resilience trajectory may not have been observed. Further, as these items were analyzed singly, and not aggregated into all exhaustive sets of potentially significant risk factors, this may have contributed to the presence or absence of significance in the results of the risk factor analyses. The goal of this analysis, however, was not to identify the best fitting model, but rather to identify
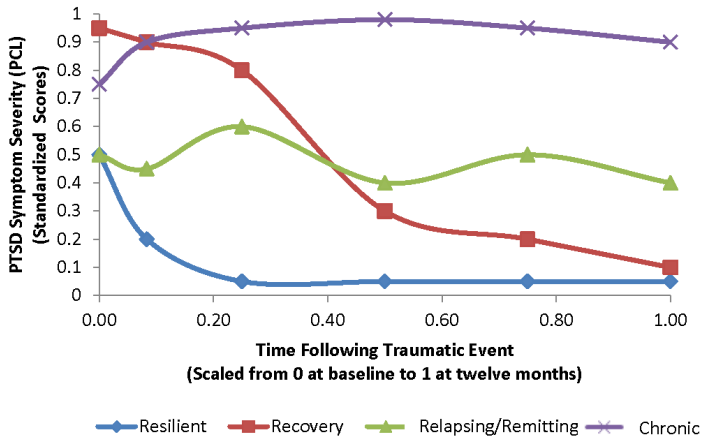
FIGURE 1. Longitudinal Trajectories Found in PTSD Checklist Data.

a reasonably fitting model that is also interpretable based on prior theory. In any case, there is a possibility that other undetected risk factors may be significantly affecting the outcome trajectories for PTSD. Future studies should consider researching homelessness as a risk factor. Medications administered during initial hospitalization, ICU stay, and traumatic brain injuries were not included as covariates for trajectory assessments.

Additional research into the replication of the outcome trajectories with a sample of all levels of posttraumatic stress in injured trauma survivors would be valuable, specifically for those who have PTSD levels below the cut-off criteria of a score of 35 or more for the PCL measure. This research would aid in the clarification of the true underlying trajectory outcomes that occur in the PTSD population as a whole. A more thorough inspection of additional risk factors would be useful to gain a greater understanding of the factors that affect trajectory patterns. Assessment of an increased number of risk factors—specifically those listed in the meta-analyses by Brewin, Andrews, and Valentine (2000) and Ozer, Best,

Lipsey, and Weiss (2003) that were found to be significant to PTSD outcomes, which were not available in the data subset (e.g., general childhood adversity, lack of social support, prior psychological adjustment, posttrauma social support, physical health, and peritraumatic dissociation)—would be useful in providing additional information about the comorbidities of trauma and posttraumatic stress (Warren et al., 2014). Moreover, study of the SGBA outcome trajectories for all trauma survivors, without restriction to injured hospitalized patients, would be of great value. Thorough examinations of both civilian and military populations, situations, and risk factors are needed for support of this method of assessment. Lastly, assessments and comparisons of the PCL to other instruments measuring PTSD severity and the resulting trajectories within these populations could serve to enhance the PTSD trajectory literature. Future investigation could further assess whether stepped-care intervention procedures may optimally address the diverse PTSD trajectory patterns observed in injured trauma survivors through the tailoring of intervention timing and dosing.

TABLE 4. Odds Ratios: Intervention and Significant Risk Factors

	Group							
	Resilience		Recovery		Relapsing/Remitting		Chronic	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Control	1.00	—	2.08	[0.76, 5.64]	2.80	[0.93, 8.39]	1.27	[0.46, 3.52]
Intervention	1.00	—	0.51	[0.18, 1.47]	0.20	[0.05, 0.77]	0.22	[0.06, 0.78]
Race	1.00	—	1.27	[0.52, 3.13]	0.70	[0.21, 2.35]	4.53	[1.42, 14.39]
Psych. Hist.	1.00	—	4.81	[1.29, 17.87]	1.79	[0.94, 3.41]	1.04	[0.56, 1.95]
Add'l Stress	1.00	—	2.77	[1.48, 5.19]	2.41	[1.37, 4.26]	5.42	[1.67, 17.57]
PHQ-9	1.00	—	9.97	[1.85, 53.82]	0.96	[0.33, 2.77]	3.49	[1.30, 9.30]

Note. n = 194. PHQ-9 = Patient Health Questionnaire; Psych. Hist. = psychiatric history; Add'l Stress = additional life stressors.

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