



Research Article

PTSD Symptoms, Disability, and Social Support in the Acute Period after a Traumatic Injury: A Preliminary Investigation of Competing Hypotheses

Matthew Price^{1*}, Maggie Evans¹ and James Bagrow^{2,3}

Abstract

Background: Social support is hypothesized to protect against PTSD symptoms and disability. However, few studies have examined the direction of the relation among these variables in the acute period after a trauma. The current study examined the relation between social support, PTSD symptoms, and disability in the 3-months after a traumatic injury.

Methods: Traumatic injury patients recruited from a trauma center completed measures of PTSD, social support, and disability within days of their trauma, 1 month later, and 3 months later.

Results: Linear regressions suggested that PTSD symptoms and disability were negatively associated with subsequent social support. However, social support was unrelated to subsequent PTSD symptoms and disability.

Conclusions: PTSD symptoms and disability erode social support in the acute period after a trauma. Social support was not found to protect against PTSD symptom severity or disability. Future work is needed to explore the precise mechanism by which this occurs.

Keywords

PTSD; Social support; Acute care; Traumatic injury; Disability

The Association Between Social Support and Acute PTSD Symptoms: A Preliminary Investigation of the Erosion and Buffering Hypotheses

Traumatic injury increases risk for posttraumatic stress disorder (PTSD) [1,2] and is a leading cause of disability [3]. Social support, the perceived and actual assistance received from others in response to a stressful event, has been identified as a key protective factor against PTSD and the associated disability [4,5]. Social support is a multi-dimensional construct and different dimensions are more relevant to PTSD symptoms [6,7]. Specifically, emotional support defined as experiencing caring and empathy from others [8], was found to be most closely associated with symptom change [6]. As a result, interventions targeting social support shortly after a traumatic injury

are recommended as methods to prevent PTSD and reduce disability [9,10]. However, much of the work on the relation between social support and PTSD symptoms has involved cross-sectional studies on combat veterans or disaster victims. Furthermore, no studies assessed this relation in the acute period (e.g., within days) after a traumatic event. Thus, the relation between social support, PTSD, and disability in the acute phase of a traumatic injury is unclear.

Two models have proposed different relations between social support and PTSD symptoms: the conservation of resources model and the social support deterioration model. The conservation of resources model suggests that psychological health is a function of an individual's ability to maintain resources [11]. Resources are defined as individual values that include mastery of a skill set, self-esteem, and professional roles. Exposure to stressful events decreases resources, which in turn, increases distress. The magnitude of the distress is moderated by the presence of factors that buffer against net resource loss such as social support.

Support for the buffering effect of social support following a trauma comes from several sources. Women who reported greater social support prior to the known stressful event of child birth reported less post-birth distress [12]. However, this finding is confounded by the increased support that often accompanies a pregnancy. A birth-cohort study that followed participants from birth for a period of 26 years showed a significant relation negative between cohesion within the family of origin and subsequent PTSD symptoms after a traumatic event [13]. Social support was not specifically assessed, however. Finally, rape victims contacted an average of 9 years after the event were asked to rate the support they received after the rape [14]. Although the study is retrospective, victims who were satisfied with the reactions of others to their assault reported decreased PTSD symptoms. Thus, there is evidence to suggest that the presence of support can mitigate the severity of a stress response to a trauma.

Alternatively, the social support deterioration model posits that PTSD symptoms reduce social support. PTSD is associated with interpersonal difficulties, feelings of detachment, irritability, and avoidance of social stimuli. This model is consistent with cognitive theories of PTSD that suggest those with PTSD adopt a perspective in which others are viewed as dangerous and the world as unsafe [15,16]. As symptoms increase, support networks are viewed with frustration, potential support members are perceived as threatening, social interactions are thought to increase risk for additional trauma exposure, and social support overall decreases [17,18].

Several longitudinal empirical studies provide support for the social support deterioration model. A large sample of male Gulf War veterans assessed within 7 years of their deployment and then reassessed 5 years later reported that initial PTSD symptoms predicted lower social support at 5 year follow-up [19]. However, initial social support did not predict PTSD symptoms. Similar findings were obtained in another study using Vietnam and Gulf War veterans [7] in which PTSD symptoms were predictive of lower levels of interpersonal support from non-veteran peers and partially associated with poorer support from veteran peers over a 6 month period. Kaniasty & Norris [20] examined the association between PTSD and social support over the course of two years in survivors of

*Corresponding author: Matthew Price, Department of Psychology, University of Vermont, John Dewey Hall2 Colchester Road, Burlington VT, 05405, Tel: 802-656-3801; E-mail: matthew.price@uvm.edu

Received: May 28, 2014 Accepted: October 20, 2014 Published: October 27, 2014

a natural disaster. Increased PTSD symptoms at 1 year and 18 months after the disaster were highly predictive of reduced social support at 18 months and 2-year follow-up respectively. Furthermore, social support at 18 months did not predict PTSD symptoms at 2-year follow-up. These findings suggest that pervasive PTSD symptoms eroded social support over time. However, these studies did not assess the relation in the acute post-trauma period. It remains unknown if social support buffers against acute-period PTSD symptoms or if PTSD symptoms erode social support shortly after the traumatic event. Also, these studies used samples of combat veterans and disaster victims and it is unclear if these results generalize to other types of trauma exposure.

The current study sought to extend prior work on social support, PTSD, and disability. The relation among these variables was examined in a sample of victims exposed to traumatic injury shortly after their trauma and then again at 1-month and 3-month after their injury. The association was examined within the framework of the conservation of resources and the social support deterioration models. Social support was examined as a predictor of subsequent PTSD symptoms and disability. PTSD symptoms and disability were also examined as a predictor of subsequent social support. Consistent with the conservation of resource model, it was hypothesized that increased perceived social support at the time of the trauma would reduce subsequent PTSD symptoms and disability.

Methods

Participants

A total of 29 participants were recruited from a Level 1 Trauma Center in a large Southeastern city. Participants were predominantly male ($n = 16$; 55%), partnered ($n = 21$, 72%), had self-reported race and ethnicity consistent with the surrounding area (White: $n = 15$, African American: $n = 9$, Hispanic: $n = 2$; Pacific Islander: $n = 1$, Other: $n = 2$) and had a mean age of 36.48 years ($SD = 9.76$). Education status varied such that 13 (41.9%) did not complete high school, 4 (12.9%) completed high school, 8 (25.8%) completed some college, and 6 (18.4%) completed college. The majority of participants had private insurance ($n = 17$, 54.8%), 10 (32.3%) had Medicare or Medicaid, and 4 (12.9%) denied having insurance. All participants provided informed consent prior to participation.

Participants were recruited from the recovery ward of a Level 1 Trauma Center. A clinical psychologist reviewed the daily census of patients admitted through the trauma service. Patients who presented for an injury that would satisfy criterion A of the DSM-IV PTSD diagnostic criteria (e.g., motor vehicle crash, gunshot wound, stabbing) were approached at bedside. Exclusion criteria included an age older than 55 years, being unable to respond, altered mental status at the time of the initial assessment, or being in police custody. A total of 87 potential participants were identified. Of this sample, 11 declined participation, 12 were excluded, 18 could not be approached due to the nature of their injuries, and 15 were discharged prior to contact. A total of 31 patients were enrolled, but 2 participants were removed because the length of their hospital stay (> 15 days) would have significantly delayed collection of subsequent waves of data.

Measures

Standardized trauma interview (STI; [21]): The STI is a 41-item interview on different aspects of the trauma (e.g., method of escaping the event, others involved) and demographic information. The STI

was administered in the hospital to determine if the trauma met criterion A for a diagnosis of PTSD according to DSM-IV.

Posttraumatic symptom scale self-report version (PSS-SR; [22]): The PSS is a 17-item self-report measure that corresponds to the DSM-IV criteria for PTSD. Symptoms were rated on a 0-3 point scale with total scores ranging from 0 to 51. Internal consistency ranged from fair to excellent ($\alpha = 0.66$ to 0.93) in the present study. Prior work has shown that such measures of PTSD symptoms are valid when administered within days of a trauma [23,24].

Illness intrusiveness rating scale (IIRS; [24]): The IIRS is a 13-time self-report measure that assesses the extent an illness interferes with important life activities on a 1-7 point scale with total scores ranging from 7 to 91. The domains were linked specifically to the traumatic event for which the participant presented to the hospital. Internal consistency ranged from good to excellent ($\alpha = 0.87$ to 0.94) in the present study.

Medical Outcomes-Social Support Scale (MOSSS; [8]). The MOSSS is a self-report measure of several domains of social support. Only the emotional/information support subscale of the MOSSS was administered in the present study to reduce the burden of assessment on participants. The emotional/information support subscale has been most closely related to PTSD symptoms in prior work [6]: The MOSSS subscale is an 8-item self-report measure assessing perceived caring and empathy from others on a 1-5 point scale with total scores ranging from 8 to 40. Internal consistency ranged from good to excellent ($\alpha = 0.88$ to 0.97) in the present study.

Procedure

The study used a prospective longitudinal design with three waves of data collection. The first wave was completed as close to the time of injury as possible in the hospital (baseline), the second wave was completed 1-month after discharge from the hospital, and the third wave was completed 3-months after discharge from the hospital. Patients were approached within 0.5-9 days ($M = 3.41$, $SD = 2.42$) of their trauma. The timing of follow-up was based on the discharge date, rather than the injury date, to ensure that subsequent assessments captured functioning outside of the hospital. A licensed clinical psychologist administered all assessments. The baseline assessment included the STI, PSS, MOSSS, and a demographics form. The PSS at baseline assessed symptoms since their most recent trauma. Participants were contacted by telephone at 1-month and 3-month to complete follow-up assessments. Assessments involved reading questions and choices to the PSS, MOSSS, and IIRS verbatim. A subset of participants ($n_{1\text{-month}} = 8$, $n_{3\text{-month}} = 1$) who could not be contacted via telephone completed the self-report measures via an online survey. All procedures were approved by an Institutional Review Board.

Analysis

The association between PTSD symptoms, as defined by PSS scores, and social support, as defined by MOSSS scores, were tested with hierarchical linear regressions. To test the buffering model, PTSD symptoms at 1-month and 3-month were regressed on baseline social support. Three-month PTSD symptoms were also regressed on 1-month social support. Baseline PTSD symptoms were included as a covariate. To test the social support deterioration model, Social support at 1-month and 3-month were regressed on baseline PTSD symptoms. Three-month social support was also regressed on 1-month PTSD symptoms. A similar approach was used to examine

the relation in both directions between disability as defined by IIRS scores and social support.

Missing data was caused by a failure to complete 1-month ($n = 7$) and 3-month ($n = 8$) follow-ups such that those with missing data did not provide responses to all measures. Participants who completed 1-month and 3-month follow-ups had complete data. Missing data was handled with multiple imputation. Fifty datasets were constructed with complete data and results were aggregated using the guidelines of Schafer & Graham [25]. This approach is superior to list wise or pair wise deletion in that it provides parameters estimates similar to those obtained with full data [26] and is valid in small samples [27]. All participants were included in the analyses.

Results

Descriptive statistics for the sample and the bivariate associations as calculated by the Pearson's R for all variables are presented in Table 1. The majority of the sample experienced a motor vehicle crash ($n = 24$, 83%). Other traumas included gunshot wounds ($n = 3$, 10%), stabbings ($n = 1$, 3%), and a fall ($n = 1$, 3%).

Conservation of resources model

Linear regressions indicated that when controlling for baseline PTSD symptoms, there was not a significant a relation between baseline social support and 1-month PTSD symptoms ($b = 0.17$, $p = .595$, $R^2_{\text{Change}} = 0.02$) and baseline social support and 3-month PTSD symptoms ($b = -0.04$, $p = .914$, $R^2_{\text{Change}} = 0.01$) (Table 2). There was a significant negative relation between 1-month social support and 3-month PTSD symptoms ($b = -0.99$, $p < .001$, $R^2_{\text{Change}} = 0.40$). There was not a significant relation between baseline social support and average PTSD symptoms across 1 and 3-month ($b = 0.13$, $p = .669$, $R^2_{\text{Change}} < 0.01$). There was not a significant relation between baseline social support and 1-month disability ratings ($b = 0.05$, $p = .925$, $R^2_{\text{Change}} = 0.01$) and baseline social support and 3-month disability ratings ($b = -0.20$, $p = .646$, $R^2_{\text{Change}} = 0.01$). There was not a significant relation between 1-month social support and 3-month disability ratings ($b = -0.01$, $p = .976$, $R^2_{\text{Change}} < 0.01$). Lastly, there was not a significant relation between baseline social support and average disability across 1 and 3-month ($b = -0.13$, $p = .796$, $R^2_{\text{Change}} < 0.01$).

Social support deterioration model

Linear regressions indicated that when controlling for baseline social support, there was a significant a negative relation between baseline PTSD symptoms and 1-month social support ($b = -0.53$, $p = .033$, $R^2_{\text{Change}} = 0.18$) and baseline PTSD symptoms and 3-month social support ($b = -0.54$, $p = .033$, $R^2_{\text{Change}} = 0.16$) (Table 2). There was also a significant negative relation between 1-month PTSD symptoms and 3-month social support ($b = -0.46$, $p < .001$, $R^2_{\text{Change}} = 0.17$). There was a significant negative relation between baseline PTSD symptoms and average social support across 1 and 3-month ($b = -0.64$, $p = 0.017$, $R^2_{\text{Change}} = 0.21$). There was a significant negative relation between 1-month social support and 1-month disability ratings after controlling for baseline social support symptoms ($b = -0.354$, $p < 0.001$, $R^2_{\text{Change}} = 0.44$). Lastly, there was a significant negative relation between 1-month disability ratings and 3-month social support ($b = -0.29$, $p = .001$, $R^2_{\text{Change}} = 0.25$).

Discussion

The present study examined the association between social support, PTSD symptoms, and disability in a sample of traumatic injury patients over three months after the trauma. Prior work has

consistently identified a bivariate relation between these variables, but few studies have investigated this association with a prospective longitudinal design in the acute period after trauma. Consistent with prior work [19], the results suggested that symptoms measured at an earlier assessment point were negatively associated with social support assessed at a later point. That is, PTSD symptoms and disability were negatively associated with social support at the subsequent measurements. Social support, however, was largely unrelated to subsequent PTSD symptoms or disability. These findings support the social support deterioration model that suggests increased distress after a traumatic event reduces social support.

The negative association between PTSD symptoms and subsequent social support may be attributed to a lack of support mobilization. Support mobilization is defined as the receipt of tangible support that is consistent with perceptions of support [28]. For example, an individual who perceives their support network as willing to provide home assistance after an injury, but is unable to receive such support would have low mobilization. Prior work with disaster victims has demonstrated that those who felt their community responded appropriately to their needs had less distress than those who were disappointed with the response of their community [28-30]. Therefore, those individuals with more severe PTSD symptoms after their trauma may have perceived the tangible response from their social network as insufficient. Additional work that includes measures of tangible support is needed to test support mobilization as the mechanism by which support is influenced by symptoms in the acute period.

The only support for the conservation of resources model was a significant relation between social support at 1-month and PTSD symptoms at 3-months. There are two potential explanations for this result. First, the relation between social support and PTSD symptoms may evolve over time such that elevated support in the months after the event may buffer against PTSD symptoms [14]. Second, the relation may have been a Type I error given the lack of additional significant findings. Further work is needed to explore this relation that includes additional assessment points and larger samples.

These findings have several clinical implications for working with patients shortly after a traumatic injury. The deterioration model is posited to reflect the maladaptive cognitions associated with PTSD [15,16]. Interventions that target these cognitions directly [23,31] may have additional benefit in that they could preserve positive perceptions of social support, which may result in better overall outcomes [6]. Given that PTSD symptoms experienced within days after trauma demonstrated an erosion effect, early interventions are needed. Such interventions provide the trauma victim with positive coping strategies that may reduce their network utilization. The reduced burden placed on the network may then maintain positive perceptions.

The present study had several limitations of note. Although the sample size for the current study was consistent with other studies that have prospectively examined victims at the time of their trauma [32,33], the sample was small and future work with larger samples is needed for replication. The findings of the present study should be considered preliminary before any conclusions can be drawn as to the nature of the relation between social support and subsequent outcomes. It may be the case that the buffering effect of social support on PTSD symptoms is small and requires a substantially larger sample to detect. Collecting data from participants shortly after a trauma is feasible [34,35], but is challenging given the collaboration

Table 1: Descriptive statistics and correlation matrix of included variables.

	1	2	3	4	5	6	7	8
1. Baseline MOSSS	1.00							
2. 1-Month MOSSS	0.17	1.00						
3. 3-Month MOSSS	0.36	0.85**	1.00					
4. Baseline PSS	0.03	-0.42*	-0.39*	1.00				
5. 1-Month PSS	0.12	-0.65**	-0.56**	0.54**	1.00			
6. 3-Month PSS	0.00	-0.74**	-0.58**	0.41*	0.71**	1.00		
7. 1-Month IIRS	0.03	-0.66**	-0.50**	0.40*	0.76**	0.60**	1.00	
8. 3-Month IIRS	-0.05	-0.39*	-0.31	0.29	0.57**	0.68**	0.59**	1.00
Mean	33.58	32.37	32.32	11.70	19.71	18.18	55.21	48.13
SD	7.68	8.85	9.44	7.09	12.55	12.73	16.81	19.73

Note: * = $p < 0.05$, ** = $p < 0.01$. PSS = Posttraumatic symptom scale. MOSSS = Medical Outcomes Social Support Survey. IIRS = Illness Intrusiveness Rating Scale.

Table 2: Final step of linear regressions assessing the association between social support, PTSD symptoms, and disability.

	Dependent Variable							
	Conservation of Resources				Social Support Deterioration			
	PSS 1 - Month		PSS 3-Month		MOSSS 1-Month		MOSSS 3- Month	
R²	0.33		0.01		0.18		0.16	
	b	SE	b	SE	b	SE	b	SE
MOSSS Baseline	0.17	0.37	-0.04	0.37	-	-	0.52	0.29
PSS Baseline	0.96**	0.31	0.75*	0.35	-0.53*	0.25	-0.54*	0.25
	Dependent Variable							
	IIRS 1-Month		IIRS 3-Month		MOSSS 1-Month		MOSSS 3- Month	
	0.01		0.01		0.44		0.25	
	b	SE	b	SE	b	SE	b	SE
MOSSS Baseline	0.05	0.48	-0.2	0.46	0.24	0.2	0.52	0.28
IIRS 1-month	-	-	0.68**	0.19	-0.35**	0.08	-0.29**	0.09

Note: * = $p < 0.05$, ** = $p < 0.01$. PSS = Posttraumatic symptom scale. MOSSS = Medical Outcomes Social Support Survey. IIRS = Illness Intrusiveness Rating Scale.

required to gain access to participants [36]. There is a need for innovative methodologies in which data can be obtained at minimal burden to patients and care systems. One such strategy involves the use of technology including mobile devices, websites, and automated telephone calls [37]. Pilot results such as those presented here highlight the important knowledge to be gained, however.

A second limitation was the limited number of trauma types that were included in the sample. The present study included a majority of motor vehicle accident victims, which can result in a different pattern of symptoms than other types of trauma such as sexual assault. It is hypothesized that the role of social support on subsequent symptoms will vary as a function of trauma type. Also, the current study relied solely on self-reported measures of perceived social support. Future work should use multi-method strategies to assess different types of social support to fully assess the construct. Such strategies should include the use of objective measures of social support obtained through behavioral observation and review of communication records. The period after a traumatic event is marked by fluctuations in symptoms, numerous social interactions, and multiple changes in behavior. The use of frequent symptom measurements of social functioning and related behaviors has the potential to capture this variability. These high intensity measurements methods, including ecological momentary assessment, could provide insight to key changes that occur in the acute aftermath a trauma that are missed in the widely spaced approach in the current study [38]. Lastly, the present study focused solely on PTSD symptoms. Exposure to traumatic events results in a wide range of psychopathology, however, and social support may have different effects on the symptoms of other types of psychopathology [1]. Indeed, prior work has shown

that social support buffers against depression in trauma-exposed samples [39,40]. Additional symptoms that are highly comorbid with PTSD, including depression and substance abuse, should be explored in future work.

Despite these limitations, the present study evaluated two competing hypotheses as to the relation between social support and PTSD symptoms in the acute period after a traumatic event. The results suggested that symptoms and disability decreased social support and that the increased social support did not mitigate subsequent disability or PTSD symptoms. Such findings provide additional insight into how early PTSD symptoms result in impaired functioning and highlight the need for effective early interventions after a trauma. Future work should explore moderating hypotheses such that social support may moderate the relation between disability status and PTSD symptoms. Such a relation would demonstrate that an environmental variable, social support, is the mechanism by which symptoms of PTSD result in disability [3].

Acknowledgement

This publication was supported by the Maralynne Mithcam Inter professional Fellowship and Fast Forward Seed Grant awarded to Matthew Price by the South Carolina Clinical & Translational Research [SCTR] Institute, with an academic home at the Medical University of South Carolina, through NIH Grant Number UL1 TR000062.

References

1. Bryant RA, O'Donnell ML, Creamer M, McFarlane AC, Clark CR (2010) The Psychiatric Sequelae of Traumatic Injury. *Am J Psychiatry* 167: 312–320.
2. Zatzick DF, Rivara FP, Nathens AB, Jurkovich GJ, Wang J, et al. (2007) A Nationwide US Study of Post-Traumatic Stress After Hospitalization for Physical Injury. *Psychol Med* 37: 1469-1480.

3. O'Donnell ML, Varker T, Holmes AC, Ellen S, Wade D, et al. (2013) Disability after injury: the cumulative burden of physical and mental health. *J Clin Psychiatry* 74: e137-e143.
4. Brewin CR, Andrews B, Valentine JD (2000) Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *J Consult Clin Psychol* 68:748-766.
5. Ozer EJ, Best SR, Lipsey TL, Weiss DS (2003) Predictors of posttraumatic stress disorder and symptoms in adults: a meta-analysis. *Psychol Bull* 129: 52-73.
6. Price M, Gros DF, Strachan M, Ruggiero KJ, Acierno R. The role of social support in exposure therapy for Operation Iraqi Freedom/Operation Enduring Freedom veterans: A preliminary investigation. *Psychol Trauma Theory Res Pract Policy* 5: 93-100.
7. Laffaye C, Cavella S, Drescher K, Rosen C (2008) Relationships among PTSD symptoms, social support, and support source in veterans with chronic PTSD. *J Trauma Stress* 21: 394-401.
8. Sherbourne CD, Stewart AL (1991) The MOS social support survey. *Soc Sci Med* 32: 705-714.
9. Brymer M, Jacobs A, Layne C, Pynoos R, Ruzek J, et al. (2006) Psychological First Aid: Field Operations Guide, 2nd Edition. 2nd ed. National Child Traumatic Stress Network and National Center for PTSD.
10. Shalev AY, Tuval-Mashiach R, Hadar H (2004) Posttraumatic stress disorder as a result of mass trauma. *J Clin Psychiatry* 65 Suppl 1: 4-10.
11. Hobfoll SE (1989) Conservation of resources: A new attempt at conceptualizing stress. *Am Psychol* 44: 513-524.
12. Soet JE, Brack GA, Dilorio C (2003) Prevalence and Predictors of Women's Experience of Psychological Trauma During Childbirth. *Birth* 30: 36-46.
13. Koenen K, Moffitt TE, Poulton R, Martin J, Caspi A (2007) Early childhood factors associated with the development of post-traumatic stress disorder: results from a longitudinal birth cohort. *Psychol Med* 37: 181-192.
14. Ullman SE, Filipas HH (2001) Predictors of PTSD Symptom Severity and Social Reactions in Sexual Assault Victims. *J Trauma Stress* 14: 369-389.
15. Ehlers A, Clark DM (2000) A cognitive model of posttraumatic stress disorder. *Behav Res Ther* 38: 319-345.
16. Resick PA, Schnicke MK (1992) Cognitive processing therapy for sexual assault victims. *J Consult Clin Psychol* 60: 748-756.
17. Clapp JD, Gayle Beck J (2009) Understanding the relationship between PTSD and social support: The role of negative network orientation. *Behav Res Ther* 47:237-244.
18. Keane TM, Owen W, Chavoya GA, Lamparski DM, Fairbank JA (1985) Social support in Vietnam veterans with posttraumatic stress disorder: A comparative analysis. *J Consult Clin Psychol* 53: 95-102.
19. King DW, Taft C, King LA, Hammond C, Stone ER (2006) Directionality of the Association between Social Support and Posttraumatic Stress Disorder: A Longitudinal Investigation. *J Appl Soc Psychol*. 36: 2980-2992.
20. Kaniasty K, Norris FH (2008) Longitudinal linkages between perceived social support and posttraumatic stress symptoms: Sequential roles of social causation and social selection. *J Trauma Stress* 21: 274-281.
21. Foa EB, Rothbaum BO (2001) Treating the Trauma of Rape: Cognitive-Behavioral Therapy for PTSD. Guilford Press.
22. Foa EB, Riggs DS, Dancu CV, Rothbaum BO (1993) Reliability and validity of a brief instrument for assessing post-traumatic stress disorder. *J Trauma Stress* 6: 459-473.
23. Zatzick D, Roy-Byrne P, Russo J, Rivara F, Driesch R, Wagner A, et al. (2004) A randomized effectiveness trial of stepped collaborative care for acutely injured trauma survivors. *Arch Gen Psychiatry* 61: 498-506.
24. Cinà CS, Clase CM (1999) The Illness Intrusiveness Rating Scale: A measure of severity in individuals with hyperhidrosis. *Qual Life Res* 8: 693-698.
25. Schafer JL, Graham JW (2002) Missing data: Our view of the state of the art. *Psychol Methods* 7: 147-177.
26. Baraldi AN, Enders CK (2010) An introduction to modern missing data analyses. *J Sch Psychol* 48: 5-37.
27. Barnes SA, Lindborg SR, Seaman JW (2006) Multiple imputation techniques in small sample clinical trials. *Stat Med* 25: 233-245.
28. Kaniasty K (2012) Predicting social psychological well-being following trauma: The role of postdisaster social support. *Psychol Trauma Theory Res Pract Policy* 4: 22-33.
29. Norris F, Kaniasty K (1996) Received and perceived social support in times of stress: A test of the social support deterioration deterrence model. *J Pers Soc Psychol* 71: 498-511.
30. West JS, Price M, Gros KS, Ruggiero KJ (2013) Community Support as a Moderator of Postdisaster Mental Health Symptoms in Urban and Nonurban Communities. *Disaster Med Public Health Prep* 7: 443-451.
31. Rothbaum BO, Kearns MC, Price M, Malcoun E, Davis M, Ressler KJ, et al. (2012) Early Intervention May Prevent the Development of Posttraumatic Stress Disorder: A Randomized Pilot Civilian Study with Modified Prolonged Exposure. *Biol Psychiatry* 72: 957-963.
32. Birmes P, Brunet A, Carreras D, Ducassé JL, Charlet J-P, Lauque D, et al. (2003) The predictive power of peritraumatic dissociation and acute stress symptoms for posttraumatic stress symptoms: a three-month prospective study. *Am J Psychiatry* 160: 1337-1339.
33. Murray J, Ehlers A, Mayou RA (2002) Dissociation and post-traumatic stress disorder: two prospective studies of road traffic accident survivors. *Br J Psychiatry* 180: 363-368.
34. Price M, Ruggiero KJ, Ferguson PL, Patel SK, Treiber F, et al. (2014) A feasibility pilot study on the use of text messages to track PTSD symptoms after a traumatic injury. *Gen Hosp Psychiatry* 36: 249-254.
35. Cline JR (2004) Post-traumatic stress disorder: Early recognition and intervention in the emergency department. *Wis Med J* 103: 43-44.
36. Fredman SJ, Vorstenbosch V, Wagner AC, Macdonald A, Monson CM (2014) Partner accommodation in posttraumatic stress disorder: Initial testing of the Significant Others' Responses to Trauma Scale (SORTS). *J Anxiety Disord* 28: 372-381.
37. Price M, Yuen EK, Goetter EM, Herbert JD, Forman EM, et al. (2014) mHealth: A Mechanism to Deliver More Accessible, More Effective Mental Health Care. *Clin Psychol Psychother* 21: 427-436.
38. Shiffman S, Stone AA, Hufford MR (2008) Ecological momentary assessment. *Annu Rev Clin Psychol* 4: 1-32.
39. Henrich CC, Shahar G (2008) Social Support Buffers the Effects of Terrorism on Adolescent Depression: Findings From Sderot, Israel. *J Am Acad Child Adolesc Psychiatry*. 47: 1073-1076.
40. Shahar G, Cohen G, Grogan KE, Barile JP, Henrich CC (2009) Terrorism-Related Perceived Stress, Adolescent Depression, and Social Support From Friends. *Pediatrics* 124: e235-e240.

Author Affiliations

Top

¹Department of Psychology, University of Vermont, USA

²Department of Mathematics and Statistics, University of Vermont, USA

³Complex Systems Center, University of Vermont, USA

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