



The mediating role of coping self-efficacy on social support and PTSD symptom severity among injury survivors

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ABSTRACT

Background: Social support confers a protective effect against elevated PTSD symptomatology following injury. However, little is known about the mechanisms through which social support conveys this protective mental health effect in injury survivors. Coping self-efficacy is linked to both social support and PTSD symptomatology but has not been examined.

Objective: To test coping self-efficacy as a mechanism for the relationship between social support and PTSD symptom severity among injury survivors.

Method and Design: Participants consisted of 61 injury survivors (62.3% male, 72.1% White) admitted to a Level-1 Trauma Center. Social support was assessed at 2-weeks post-injury; coping self-efficacy at 6-weeks post-injury; and PTSD symptom severity at 3-months post-injury.

Results: A statistically significant indirect effect was found for the social support – coping self-efficacy – PTSD symptomatology pathway, providing evidence of mediation even after controlling for age, sex, race, and education ($B = -0.51$, $SE = 0.18$, $CI = -0.92, -0.20$).

Conclusions: Social support may exert an effect on PTSD symptom severity post-injury through its connection with coping self-efficacy. Coping self-efficacy represents an important intervention target following injury for those survivors with lower social support who are at risk for elevated PTSD symptom severity levels.

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Each year 35 million people visit the emergency department due to traumatic, nonfatal injuries (CDC, 2021). Psychiatric disorders following injury are common: 10–20% of injury survivors develop a new psychiatric disorder in the aftermath of injury with posttraumatic stress disorder (PTSD) representing one of the most common disorders experienced (Bryant et al., 2010; Bryant et al., 2015). This prevalence is significant given that PTSD represents a major contributor to long-term disability following injury (O'Donnell et al., 2013). Thus, it is critical to examine modifiable factors that protect against mental health complications in this vulnerable population.

Social support refers to received supportive behaviors from other people or perceived support availability (Haber et al., 2007). Most research in the trauma literature has focused on perceived

social support and has found it to be one of the most well-supported predictors of PTSD (Brewin et al., 2000; Ozer et al., 2003). For example, poor perceived social support following trauma exposure has been associated with negative post-traumatic mental health outcomes across a range of injured populations including survivors of road traffic accidents, sexual assault, violent crime, and military combat (Andrews et al., 2003; Dworkin et al., 2017; Holeva et al., 2001; Pollmann et al., 2021). On the other hand, the presence of strong social support has been shown to decrease the likelihood of developing PTSD (Wagner et al., 2016; Zalta et al., 2021). According to the stress-buffering model (Cohen & Wills, 1985), social support protects people from developing posttraumatic mental health problems by enhancing the “perceived ability to cope with the trauma, reducing negative appraisals of the trauma, and reducing harmful physiological responses to the trauma” (Zalta et al., 2021). Despite this consistent connection with PTSD, research has largely not investigated mechanisms accounting for the effect of social support on post-injury PTSD symptoms.

Coping self-efficacy (CSE) represents one candidate mechanism. CSE includes one’s perceived capacity for effective emotion regulation, help-seeking behavior, and management of distressing thoughts (Samuelson et al., 2017). According to Benight and Bandura (2004), a bidirectional relationship may exist between social support and CSE. For instance, the presence of social support in the aftermath of trauma may enhance a person’s sense of capability to respond to posttraumatic challenges, as well as elevate perceptions of the resources that are available, resulting in elevated CSE levels. Schwarzer and Knoll (2007) referred to this as the enabling hypothesis. It is supported by research showing that people who experience higher social support under conditions of stress utilize less avoidance-oriented coping strategies (e.g., denial, wishful thinking) and engage in more approach-oriented coping strategies (e.g., positive reappraisal, problem solving). This response results in lower levels of psychological distress (Calvete & Connor-Smith, 2006; Holahan et al., 1997). Thus, social support may enhance a person’s CSE by promoting effective coping responses. Alternatively, higher CSE levels following trauma may translate into a greater willingness to activate one’s social support network, increasing the amount of social support received, often referred to as the cultivation hypothesis (Schwarzer & Knoll, 2007). Although there is some evidence for this latter hypothesis (e.g., Johansen et al., 2007), most research to date has shown that social support following trauma exposure is associated with higher levels of coping self-efficacy (e.g., Benight et al., 1999; Smith et al., 2013).

CSE is also associated with PTSD symptomatology: Higher CSE levels can result in trauma survivors feeling capable and effective in managing their post-trauma symptoms and recovery, whereas lower levels can lead to elevated PTSD symptomatology and impaired coping efforts (Bosmans et al., 2013; Bosmans & van der Velden, 2015; Gallagher et al., 2019; Luszczynska et al., 2009; Samuelson et al., 2017). Longitudinal research following acute physical injuries (Bosmans et al., 2015; Flatten et al., 2008) and motor vehicle crashes (Benight et al., 2008) indicates that CSE is a key mediating mechanism through which initial distress influences subsequent post-traumatic adjustment. Some research has also examined the interrelationships between social support, CSE, and PTSD symptoms. In this research, CSE has been shown to function as a mediator of the relationship between social support and PTSD symptoms across a variety of populations including survivors of natural disasters, combat veterans, and patients with cancer (Benight et al., 1999; Smith et al., 2013; Wang et al., 2015).

Despite these well-established relationships, most research investigating the connections between social support, coping self-efficacy, and PTSD symptoms has been cross-sectional and limited to populations experiencing natural disasters, chronic disease, or wartime conflict (e.g., Benight et al., 1999; Smith et al., 2013; Wang et al., 2015). These features limit our knowledge on the directionality of the relationships that exist between these factors, while also making it difficult to understand how they might relate to acutely injured populations. Nearly one-third of injury survivors experience PTSD within the first year after injury (Shih et al., 2010), complicating their recovery and increasing their risk for long-term health complications (Ryder et al., 2018). To determine how best to prevent this long-term impairment, research identifying intervention targets present early post-trauma is needed. The present study overcomes these limitations by

examining whether coping self-efficacy measured at 6-weeks post-injury mediates the relationship between social support 2-weeks post-injury and PTSD symptom severity 3-months post-injury among injury survivors. Based upon prior research, we hypothesized that social support and PTSD symptom severity would be negatively related (Benight & Bandura, 2004; Wagner et al., 2016) (Hypothesis 1). We also predicted that CSE would mediate the relationship between social support and PTSD symptom severity (Benight & Bandura, 2004; Johansen et al., 2007) (Hypothesis 2).

Method

Participants

Participants consisted of 61 injury survivors who were admitted to a Level-1 Trauma Center. The sample was predominantly male (62.3%), White (72.1%; 27.9% African American), with a high school education or higher (88.7%), and an average age of 36.51 years ($SD = 12.35$). The most common events experienced by participants were motor vehicle/cycle accidents (41.0%) and assaults (24.6%).

Overall, 216 patients were potentially eligible for the study based upon initial screening of their age, proximity to the hospital, and Glasgow Coma Scale score. Of these, 9 did not meet Criterion A, 16 did not complete additional screening for Criterion A due to clinic time constraints and appointment conflicts, and 107 declined participation. Eighty-four patients were eligible based upon the endorsement of Criterion A, and 80 agreed to participate. At 2-weeks post-injury, $N = 75$ (93.7%) were retained, at 6-weeks post-injury, $N = 70$ (87.5%) were retained, and at 3-months post-injury, $N = 61$ (76.2%) were retained and made up the final analytic sample.

Procedure

All study procedures were approved by the Human Subjects Review Boards of Summa Health System (RP# 11129) and Kent State University (IRB# 11-287). Study recruitment occurred between January 2012 and May 2013 during a routine medical follow up for trauma patients. Inclusionary criteria consisted of (a) having been hospitalized for injury at a Level-1 Midwestern trauma center within 30 days prior to recruitment; (b) being 18–65 years old; (c) living within 30 miles of the hospital; (d) having a Glasgow Coma Scale score > 13 during hospital admission; and (e) meeting Criterion A of the DSM-IV PTSD diagnosis (APA, 2000). Research staff met with eligible patients and provided them with a description of the study. Interested individuals provided written informed consent. Participants were given the social support measure, which participants completed at home and subsequently returned to the research team. Measures of coping self-efficacy and PTSD symptom severity were mailed to participants at 6-weeks and at 3-months post-injury and returned to researchers via mail.

Measures

PTSD Symptom Severity

The PTSD Symptom Checklist-Civilian (Weathers et al., 1993) consists of 17 items and was used to assess PTSD symptom severity at 3-months post-injury. Participants rated how much they had been bothered by the symptoms described on a scale ranging from 0 (*Not at all*) to 5 (*Extremely*). Symptom ratings were summed to obtain a continuous total severity score (Cronbach's alpha in current study = 0.92).

Social Support

The ENRICH Social Support Inventory (Mitchell et al., 2003) provides an overall measure of perceived social support and consists of 7 items assessing structural (e.g., "Is there someone available to help you with daily chores?"), instrumental (e.g., "Is there someone available to give you good advice about a problem?"), and emotional social support (e.g., "Can you count on anyone to

provide you with emotional support (talking over problems or helping you make a difficult decision?”). It was used to assess social support at 2-weeks post-injury. Participants evaluated how much they were currently experiencing these forms of social support on a scale ranging from 1 (*None of the time*) to 5 (*All of the time*). Ratings were summed to produce a total score (Cronbach’s alpha in the current study = 0.92).

Coping Self-Efficacy

The Trauma Coping Self-Efficacy scale (Benight et al., 2015) consists of 9 items and was used to assess coping self-efficacy anchored to the injury experienced. It was administered 6-weeks post-injury. For each item, participants indicated how capable they perceived themselves to be able to manage situations resulting from their injury on a scale ranging from 1 (*I’m not capable at all*) to 7 (*I’m totally capable*). These ratings were summed to yield a total score (Cronbach’s alpha in the current study = 0.89).

Covariates

Demographic characteristics consisting of age, sex (0 = male, 1 = female), race (0 = White, 1 = Black), and education level (0 = less than a high school diploma, 1 = high school diploma or higher) were collected via survey. We included these covariates because of their known associations with PTSD (Ditlevsen & Elklit, 2010; Olff et al., 2007; Roberts et al., 2011).

Data analysis

Analyses in the current study were conducted using SPSS 27 (IBM Corp., 2020) and were completed in several steps. First, preliminary analyses examining attrition were performed. Next, we examined descriptive statistics and bivariate correlations. Finally, we conducted the mediation analysis. Traditionally, mediation is demonstrated by establishing (1) that a relationship exists between the focal predictor and the target outcome (the “total effect” or path *c*), (2) that a relationship is present between the focal predictor and mediator (path *a*), (3) that a relationship exists between the mediator and the outcome variable while controlling for the predictor (path *b*), and (4) that the relationship between the focal predictor and target outcome disappears with the inclusion of the mediator (the “direct effect” or path *c'*) (Baron & Kenny, 1986). While this is a valid method for establishing mediation, it is limited in several ways. Most notably, it does not quantify the mediating effect, but instead infers its presence through a series of statistical significance tests. If any of these tests are not statistically significant, then mediation is said to be absent. This is problematic because it is possible for mediation to occur in the absence of statistically significant total and direct effects (Hayes, 2009). Current recommendations are to examine the indirect effect associated with paths *a* and *b* to directly quantify and test the statistical significance of the mediating effect (MacKinnon et al., 2002).

To perform this analysis, the SPSS macro PROCESS was used (Hayes, 2022). Two models were tested: model 1 consisted of the variables of interest without any covariates included, while model 2 included age, sex, race, and education as covariates. In both models, PTSD symptom severity served as the outcome variable, social support served as the focal predictor variable, and coping self-efficacy served as the mediating variable. To test hypothesis 1, path *c* representing the total effect of social support on PTSD symptom severity was examined. To test hypothesis 2, the indirect effect reflecting the relationship between social support and coping self-efficacy and the relationship between coping self-efficacy and PTSD symptom severity was examined.

Results

Preliminary analyses

Fisher’s Exact Test indicated that attrition status was not related to sex (2-weeks: $p = .15$; 6-weeks: $p = 1.00$; 3-months: $p = .59$), race (2-weeks: $p = .14$; 6-weeks: $p = .46$; 3-months: $p = 1.00$), or education

level (2-weeks: $p = .42$; 6-weeks: $p = 1.00$; 3-months: $p = .68$) at any of the time points. Attrition status was also not related to age at 6-weeks post-injury ($t [78] = -1.62, p = .11$); however, it was related at both 2-weeks ($t [6.25] = -3.21, p = .02, M = 25.60$ vs. $M = 35.68$) and at 3-months post-injury ($t [78] = -2.16, p = .03, M = 29.72$ vs. $M = 36.60$) such that younger people were more likely to drop out than older people. Finally, with regard to our focal variables, attrition at 6-weeks was not related to social support at 2-weeks ($t [73] = 0.67, p = 0.51, M = 25.20$ vs. $M = 23.51$), nor was it related at 3-months to either social support at 2-weeks ($t [73] = 0.33, p = 0.75, M = 24.08$ vs. $M = 23.63$) or coping self-efficacy at 6-weeks.

Descriptive statistics and bivariate correlations

Means, standard deviations, and zero-order correlations are reported in Table 1. Consistent with expectations, both social support and coping self-efficacy had negative correlations with PTSD symptom severity. Additionally, a positive correlation was present between social support and coping self-efficacy.

Mediation analysis

Table 2 contains the statistical results from the mediation models tested. Consistent with hypothesis 1, in model 1 a statistically significant, negative relationship was found for the total effect of social support on PTSD symptom severity, whereas in model 2 this relationship became non-significant with the inclusion of covariates. However, most values in the 95% confidence interval associated with this relationship were negative, consistent with predictions.

A statistically significant positive relationship between social support and coping self-efficacy was observed in both models 1 and 2. Thus, injury survivors reporting greater levels of social support 2-weeks post-injury reported greater levels of coping self-efficacy 6-weeks post-injury. In addition, a statistically significant negative relationship was detected between coping self-efficacy and PTSD symptom severity in models 1 and 2. This relationship indicated that injury survivors with higher levels of coping self-efficacy at 6-weeks post-injury experienced lower levels of PTSD symptom severity at 3-months post-injury. Finally, the indirect effect testing the mediating effect of coping self-efficacy on PTSD symptom severity emerged as statistically significant in both models, consistent with hypothesis 2 ($b = -0.58$, 95% CI = $-0.94, -0.30$).

Discussion

With millions of people visiting the emergency department each year due to traumatic, nonfatal injuries, it is important to identify protective factors that can help decrease the likelihood of developing posttraumatic psychiatric symptoms such as PTSD (Bryant et al., 2010; Bryant et al., 2015; CDC, 2021). Although a considerable amount of research has examined the relationship between social support

Table 1. Descriptive statistics and bivariate correlations among the study's variables.

Variable	1.	2.	3.	4.	5.	6.	7.	<i>M</i>	<i>SD</i>
1. 3-Month PTSD Symptom Severity	1.00							32.49	12.51
2. 6-Week Coping Self-Efficacy	-.52**	1.00						103.21	24.62
3. 2-Week Social Support	-.26*	.51**	1.00					23.54	5.76
4. Age	-.14	.15	.01	1.00				36.51	12.35
5. Sex	.04	-.05	.02	-.03	1.00			0.38	0.49
6. Race	.31*	-.23	-.12	-.28*	-.11	1.00		0.28	0.45
7. Education	-.02	.19	.14	.13	.28*	-.12	1.00	0.89	0.32

Note. Sex was coded with 0 = male, 1 = female; race was coded with 0 = White, 1 = Black; education was coded with 0 = less than a high school diploma, 1 = high school diploma or higher.

* $p < .05$, ** $p < .01$

Table 2. Mediation of trauma coping self-efficacy post-injury on the relationship between social support and PTSD symptom severity.

	Model 1		Model 2	
	<i>B</i> (SE)	95% CI	<i>B</i> (SE)	95% CI
Total Effect (<i>c</i>)	−0.57 (0.27)	−1.11, −0.02	−0.51 (0.27)	−1.06, 0.04
SS → PTSS				
Path <i>a</i>	0.97 (0.22)	0.54, 1.41	0.91 (0.22)	0.47, 1.34
SS → CSE				
Path <i>b</i>	−0.60 (0.15)	−0.89, −0.30	−0.56 (0.15)	−0.86, −0.25
CSE → PTSS				
Indirect Effect (<i>a*b</i>)	−0.58 (0.16)	−0.94, −0.30	−0.51 (0.18)	−0.92, −0.20
SS → CSE → PTSS				
Direct Effect (<i>c</i>)	0.01 (0.28)	−0.55, 0.58	−0.01 (0.28)	−0.57, 0.56
SS → PTSS				

Note. SS = social support; CSE = coping self-efficacy; PTSS = PTSD symptom severity

and PTSD, less attention has been given to the mechanisms through which social support impacts PTSD in recent injury survivors. Only by examining recent trauma victims can results inform early interventions addressing PTSD symptoms before they become chronic and exert debilitating effects. The present study examined how coping self-efficacy at 6-weeks post-injury mediated the relationship between social support at 2-weeks post-injury and PTSD symptom severity at 3-months post-injury.

Results indicated that injury survivors who experienced greater social support following injury also reported lower subsequent PTSD symptom severity levels, providing support for Hypothesis 1. This relationship was statistically significant in model 1, but not in model 2. However, the confidence interval associated with the total effect in model 1 suggested that this relationship was indeed negative, consistent with hypotheses. This is consistent with prior research examining the protective effect of social support against PTSD (Andrews et al., 2003; Dworkin et al., 2017; Holeva et al., 2001; Pollmann et al., 2021). Additionally, our findings extend existing research by demonstrating that coping self-efficacy can explain the relationship between social support and PTSD symptom severity among injury survivors, providing support for Hypothesis 2.

These findings suggest early post-injury beliefs that there are people available to provide a range of critical supportive actions (e.g., tangible actions, advice and direction, emotional caring) impact subsequent posttraumatic distress months later through enhanced self-regulation capacity (i.e., coping self-efficacy). Benight and Bandura (2004) proposed that posttraumatic adaptation revolves around the dynamic interactions between environmental factors such as social support and self-regulatory mechanisms, primarily coping self-efficacy, in determining recovery trajectories. Schwarzer and Knoll (2007) argued that social support can provide an enhanced sense of capability (enabling hypothesis) that promotes a sense of perceived control in managing stressful challenges. Our findings offer support for the importance of self-beliefs embedded in the social context following a critical traumatic injury experience.

Implications

These findings can be used to improve the care provided to injury survivors by informing early intervention strategies. Existing practice guidelines suggest that supportive care, rather than formal clinical treatment, may be the most appropriate intervention response in the immediate aftermath of trauma (American Psychiatric Association, 2010). The provision of supportive care during the acute trauma period was originally proposed for military personnel; however, it has since been applied to a wide range of populations including female survivors of sexual assault, spouses of war veterans with PTSD, and individuals exposed to natural disasters (Billette et al., 2008; Dieltjens et al., 2014; Rusmana et al., 2020; Vagharseyyedin et al., 2018).

In the context of injury, supportive care might entail providing psychoeducation on common trauma reactions, offering peer support groups, encouraging survivors to identify and call upon close others, and assisting survivors' social support networks with identifying supportive behaviors that might facilitate effective coping (Zatzick et al., 2015; American Trauma Society, n.d.). Collectively, the support received from these actions may enhance CSE through the impact that it has on the injury survivor's perceived capabilities of managing the distress associated with their injury (Schwarzer & Knoll, 2007).

While these resources will yield a protective effect for many injury survivors, research indicates that some people may experience elevated PTSD symptoms in the weeks and months following injury despite this supportive care (Billette et al., 2008; Guay et al., 2004; Monson et al., 2012; Monson & Fredman, 2012; Sautter et al., 2009). Our findings suggest that interventions targeting CSE may represent an additional strategy capable of reducing PTSD symptoms. For example, cognitive behavioral therapy represents one of the most well-supported treatment approaches for PTSD (Bryant, 2011) and changes in CSE have been proposed to be one of the key mechanisms accounting for this effect (Zlomuzica et al., 2015), making CBT a strong candidate for improving CSE among injury survivors who do not respond to initial supportive care. Applied to a post-injury sample, cognitive behavioral therapy may serve to increase survivors' awareness of the effectiveness of social support and of the key sources of support in their lives. Because self-efficacy beliefs develop through multiple sources of information (Bandura, 1997; Benight & Bandura, 2004), this explicit examination of trauma-related thoughts and social support sources that may assist with the coping process may more effectively address unremitting PTSD symptoms following supportive care.

This approach fits well with current stepped care models of early intervention for injury (O'Donnell et al., 2008). Stepped care involves screening injury survivors for PTSD-related risk in the weeks and months following trauma and delivering intervention resources that are matched to the severity of the PTSD symptoms reported (O'Donnell et al., 2008). Results from the current study suggest that screening for social support, providing supportive care in the immediate aftermath of injury, and offering CBT for unremitting PTSD-related distress might be an effective stepped care strategy.

Limitations

The current study has several limitations. First, the sample size was relatively small, with younger people being more likely to be lost to follow up. However, we did try to account for this differential attrition by controlling for age. Additionally, our sample consisted of mostly White or Black male participants, limiting its generalizability. For example, research indicates that Asian Americans are less likely to benefit from the type of social support assessed in the current study, which focuses on the receipt of structural, instrumental, or emotional support efforts (Taylor et al., 2007). That being said, our sample's demographic characteristics are representative, both of the local population and of injury survivors more broadly (Prekker et al., 2009). Lastly, the current study relied on a self-report measure to assess the target outcome. While the psychometric properties of the PCL-C are well supported (Blanchard et al., 1996; Ruggiero et al., 2003), findings from the current study would be strengthened if replicated using a gold standard semi-structured interview such as the Clinician Administered PTSD Scale.

Conclusions

In sum, the current study demonstrated that CSE mediates the relationship between social support in the immediate aftermath of trauma and subsequent PTSD symptom severity among injury survivors. These findings can inform early intervention approaches in this population and suggest that CSE might be a key target for preventing the development of PTSD following injury.

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