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# Association of social support during emergency department evaluation for acute coronary syndrome with subsequent posttraumatic stress symptoms

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## Introduction

Patients who present to the emergency department (ED) with symptoms indicative of acute coronary syndrome (ACS) experience a great deal of stress. Evaluation for non-ST elevation myocardial infarction (NSTEMI) or unstable angina (UA) in the ED can be accompanied by feelings of fear, vulnerability, and loss of control (Edmondson, Shimbo, Ye, Wyer, & Davidson, 2013). Indeed, a recent meta-analysis found that 12% of ACS patients subsequently screen positive for posttraumatic stress disorder (PTSD) because of their ACS experiences. Post-ACS patients with PTSD are at increased risk of recurrent cardiac events and mortality (Edmondson et al., 2012; Känel et al., 2011), poor quality of life and patient satisfaction (Doerfler, Paraskos, & Piniarski, 2005; Edmondson et al., 2013), high medical utilization (Edmondson et al., 2013), and lower adherence to critical cardiovascular medications (Kronish, Edmondson, Goldfinger, Fei, & Horowitz, 2012; Shemesh et al., 2001). ED variables such as overcrowding have been associated with the development of posttraumatic stress symptoms (PSS) (Edmondson et al., 2013), but appropriate social support in the ED may offset risk for PSS. Conversely, social support that is anxiety provoking may exacerbate stress in the ED and increase risk for PSS.

The availability of social support has been shown to promote psychological wellbeing and reduce morbidity and mortality in cardiac patients. Low perceived social support has been associated with both depression (Frasure-Smith et al., 2000; Frasure-Smith, Lesperance, Juneau, Talajic, & Bourassa, 1999) and PSTD (Bennett & Brooke, 1999; Marke & Bennett, 2013a) following an acute cardiac event. Among individuals with coronary artery disease (CAD), those who live alone or have small social networks also have higher cardiac and all-

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**Declaration of Conflicting Interests**

None to declare.

cause mortality rates than those who are more socially integrated (Brummett et al., 2001; Case, Moss, Case, McDermott, & Eberly, 1992; Rutledge et al., 2004; Williams et al., 1992).

While social support availability appears to confer many positive benefits to patients, the experience of such support can have potentially negative effects when it is neither desired nor needed, or when it does not match the recipient's needs (Cohen & McKay, 1984; Heller, Swindle, & Dusenbury, 1986). Negative aspects of social support may be less prevalent than positive aspects, but negative social support may be more strongly related to wellbeing (Finch, Okun, Barrera, Zautra, & Reich, 1989; Rook, 1984), psychological distress (Finch et al., 1989; Lepore, 1992), and depression (Ingram, Jones, Fass, Neidig, & Song, 1999; Revenson, Schiaffino, Majerovitz, & Gibofsky, 1991) than positive social support.

Uchino and colleagues' work on the complex relationship between social support and cardiovascular reactivity during laboratory conditions simulating acute psychological distress is most relevant to the present study. At the biological level, cardiovascular reactivity is a physiological indicator of stress and has been related to cardiovascular disease states (Treiber et al., 2003) and PTSD (Buckley & Kaloupek, 2001). Perceived social support, which Uchino distinguishes from received social support and defines as "one's potential access to social support" (Uchino et al. 2011, p. 1137), has been found to reduce cardiovascular reactivity to an acute stressor. For example, Uchino & Garvey (1997) found that subjects who were told that an experimenter was available to help or answer questions had lower systolic and diastolic blood pressure during a speech task compared to subjects who did not have an experimenter available to them. These results support the stress-buffering theory of social support, which proposes that social support can buffer the negative impact of stressful events (Cohen & Wills, 1985). The quality of perceived social ties, in addition to their mere presence, also plays an important role in health. When Birmingham et al. (2009) manipulated the relationship positivity and negativity of an experimenter, they found that relationship positivity was associated with lower systolic blood pressure reactivity in subjects performing a speech stressor. Even when supportive ties are subliminally activated rather than immediately accessible, they reduce cardiovascular reactivity to psychological stressors (Smith, Ruiz, & Uchino, 2004). Subliminally activated negative ties, on the other hand, have been associated with greater threat, lower feelings of control, and higher diastolic blood pressure reactivity during stress in subjects completing arithmetic and speech tasks (Carlisle et al., 2012). Collectively, these studies suggest that access to social support can buffer stress but that the benefits of social support arise in interaction between the support provider and receiver.

Studies examining received social support, which Uchino defines as "the reported receipt of support resources…during a specific time frame" (Uchino et al. 2011, p. 1137), tend to demonstrate similar relationships to health as perceived support. For instance, subjects who engaged in a debate about a controversial issue with two confederates showed significantly smaller increases in cardiovascular measures if a third confederate defended the subject's position than if a third confederate sat quietly and offered no support (Gerin, Pieper, Levy, & Pickering, 1992). Lepore, Allen, & Evans (1993) found that college students who gave a speech with an unsupportive confederate present exhibited greater increases in systolic and diastolic pressure during the stressor task than students who gave a speech alone or in front

of supportive confederates. Uno et al. (2002) also found that women under stress showed lower cardiac output reactivity when provided with emotional support from a purely supportive friend.

The support-reactivity hypothesis, proposed by Uchino et al. (2011), describes three important contextual processes linking received support to cardiovascular reactivity. First, task-related factors refer to the alignment of the type of social support with the needs associated with a distinct stressor. Second, recipient-related factors refer to the recipient's choice to receive support and the goals of the recipient. Third, provider-related factors refer to the quality of the social support relationships (e.g., negative, positive, ambivalent) (Uchino, Carlisle, Birmingham, & Vaughn, 2011). Received social support appears to be the most effective and beneficial when it appropriately addresses the stressor in question and the recipient's stressor-related concerns, is sought out by the recipient, and is marked by positivity rather than negativity.

The ED serves as the first point of care for most individuals in their medical evaluation for potentially life threatening cardiac events. At times the ED is a chaotic and potentially stressful environment for patients awaiting care. For patients being evaluated for an acute cardiac event, this environment may couple with the fear of experiencing a severe cardiac illness to promote PSS and other adverse psychological outcomes. The buffering hypothesis suggests that social support may play a particularly important role in the health outcomes of patients who are evaluated for such events in an ED, but the nature of the support that is received may influence its effect on the subsequent development of PSS.

We examined the associations of different types of received social support during ED evaluation with subsequent PSS [acute stress disorder (ASD) symptoms; i.e., posttraumatic stress disorder (PTSD) symptoms within the first month of a potentially traumatic event] in patients presenting for symptoms consistent with ACS. We hypothesized that positive social support would be protective against subsequent PSS, and that negative social support would be harmful, as it would be associated with increased PSS. Finally, we hypothesized that these effects would be mediated by their influence on participants' threat perceptions during their ED stay.

## Methods

Participants were 484 patients enrolled in the REactions to Acute Care and Hospitalization (REACH) study (Haerizadeh, Moise, Chang, Edmondson, & Kronish, 2016; Ho et al., 2016; Kronish et al., 2016; Sumner et al., 2015; Sundquist et al., 2016). REACH is an observational cohort study of a consecutive sample of patients presenting to an urban ED in New York City (Columbia-New York Presbyterian Hospital) with symptoms of suspected ACS. Patients were potentially eligible once they had been given a provisional diagnosis of "probable ACS" by their treating ED physicians. Patients were excluded if they had ST elevations on their electrocardiograms in the ED, as these patients are typically immediately sent to the cardiac catheterization laboratory upon arrival and are unavailable for consent in the ED. Patients were also excluded if they were non-English and non-Spanish speaking,

cognitively impaired, in need of immediate psychiatric intervention, terminally ill, or otherwise unavailable for 1 year of follow-up.

Participants were enrolled in the ED, where they reported on their current perception of threat. Later, during inpatient stay or by telephone if they were discharged quickly after hospital admission, participants were asked to retrospectively report their perceptions of threat in the ED, their social support in the ED, and their current PSS. The second interview was completed within the first 30 days after enrollment. Time to completion was a median of 3 days after ED enrollment, with 75% occurring within the first week of ED enrollment.

## Measures

**Threat perception during ED stay—**During treatment in the ED, patients reported their perceptions of personal threat. The 6-item questionnaire is based on Ozer et al.'s meta-analysis of items most predictive of subsequent PTSD (Ozer, Best, Lipsey, & Weiss, 2003). Patients were asked to rate their level of agreement with statements such as "I am afraid," "I feel helpless," "I feel vulnerable," and "I worry that I am not in control of my situation" on a 4-point Likert scale ranging from 0 (Not at all) to 4 (Extremely). Responses to these items had good internal consistency (Cronbach's $\alpha = 0.79$). Previous research (Wiedemar et al., 2008) has utilized similar items to assess perceived vulnerability after an acute cardiac event. During the second interview, we repeated administration of these items by asking participants to retrospectively report on their ED experience to account for the influence of current distress on social support assessment.

**Posttraumatic stress symptoms—**In a second interview, conducted either at inpatient bedside or within 30-days of inpatient hospitalization by telephone, patients completed the Acute Stress Disorder Scale (ASDS) with reference to their cardiac event. The ASDS is a 19-item inventory based on the Diagnostic and Statistical Manual of Mental Disorders, 4$^{th}$ ed. (American Psychiatric Association, 1994). The ASDS assesses early PSS in the acute aftermath of a traumatic event, as the diagnosis of PTSD itself cannot be made within 1 month of a traumatic event (Bryant, Moulds, & Guthrie, 2000). For each item, participants were prompted with the timeframe, "Since the heart problem that brought you to the hospital," and then asked to rate their responses to questions such as, "Did you ever feel numb or distant from your emotions?", "Have you had bad dreams or nightmares about your heart problem?", or "Have you become more alert to danger?" on a 5-point Likert scale ranging from 1 (Not at all) to 5 (Very much). A total symptom severity score was calculated by summing responses to the 19 items. Internal consistency of the ASDS in the current sample was excellent (Cronbach's $\alpha = .90$).

**Social support—**In the second interview, participants also reported on aspects of social support that they received from family, friends, and partners in the ED. Social support questions were asked during the second interview so that participants could answer openly, as social support providers were either no longer present or felt comfortable enough with study personnel to leave the participant alone to complete the interview. Once participants confirmed which individual was most supportive to them in the ED, they were asked to rate their responses to 2 questions assessing positive and 2 assessing negative social support on a

5-point Likert scale ranging from 1 (None of the time) to 5 (All of the time). These questions are based on Ozer et al.'s (2003) finding that social support is a significant predictor of PTSD.

Positive social support was assessed by the two items, "While you were in the emergency room, how much of the time was your support person able to comfort you?" and "While you were in the emergency room, how much of the time was your support person responsive to your needs?" The correlation between the 2 positive support items was $r = .58$, $p = .05$.

Negative social support was assessed by 2 items, "While you were in the emergency room, how much of the time did your support person need you to comfort them?" and "While you were in the emergency room, how much of the time did your support person make you anxious?" The 2 negative social support items were correlated at $r = .30$, $p < .05$.

Because neither the positive nor negative items were correlated with one another strongly, they were analyzed both as scales and as single items.

## Covariates

**Discharge ACS status—**REACH enrolls patients who are being evaluated for probable ACS in the ED. However, after all diagnostic tests are completed, many participants receive alternative diagnoses at discharge, such as atrial fibrillation, heart failure exacerbation, or non-cardiac chest pain. A research nurse determined discharge diagnosis from the medical record, and diagnoses were adjudicated by a board-certified cardiologist. NSTEMI is defined by a typical rise and gradual fall (troponin levels) or more rapid rise and fall (creatine kinase MB levels) of biochemical markers of infarction with one of the following in the absence of ST elevations: (a) ST-segment depression; (b) T wave abnormalities; (c) ischemic symptoms without ST-segment depression or T wave abnormalities in the presence or absence of chest discomfort (unexplained nausea and vomiting or diaphoresis persistent shortness of breath unexplained weakness, dizziness, lightheadedness, or syncope). UA is defined by angina pectoris (or equivalent type of ischemic discomfort) with no biochemical evidence of MI and any of the following within the 6 weeks prior to admission: (a) angina occurs at rest and that is prolonged, usually longer than 20 minutes; (b) new-onset angina of at least class II severity according to the Canadian Cardiovascular Society criteria; (c) recent worsening of angina reflected by an increase in severity of at least 1 class to at least class II according to the Canadian Cardiovascular Society criteria.

**Global registry of acute coronary events (GRACE) risk score—**The GRACE index is a postdischarge prediction model for 6-month mortality in patients with cardiac disease derived from a multinational registry (Fox et al., 2006). The variables collected from the medical record in the GRACE index were age, history of MI, history of heart failure, presenting pulse rate, systolic blood pressure at presentation, initial serum creatinine level, initial cardiac enzyme levels, ST-segment depression on presenting electrocardiogram, and in-hospital percutaneous coronary intervention. The GRACE index has a range from 1 to 263 points, with higher scores indicating greater mortality risk.

**Charlson comorbidity index—**We abstracted the 19 conditions that are included in the Charlson comorbidity index (e.g., congestive heart failure, diabetes mellitus) from participants' medical records (Charlson, Szatrowski, Peterson, & Gold, 1994). To calculate the Charlson index, conditions are weighted from 0 to 6, and points are then summed to generate a total score that can range from 0 to 37. This overall score reflects cumulative increased likelihood of 1-year mortality; the higher the score, the more severe the comorbidity.

### Analysis plan

Statistical analyses were conducted using IBM SPSS v23 software. We first estimated bivariate correlations among study variables. Next, we tested the association of having any support provider present during ED evaluation on subsequent PSS (as assessed by the Acute Stress Disorder Scale) using multiple regression with adjustment for demographic and clinical variables. Next, for participants who had a support provider present, we tested 3 sequential models to estimate the association of both positive and negative received social support in the ED on PSS (6 models total). In Model 1, we estimated the association of age, sex, cardiac risk score, and medical comorbidities with PSS. In Model 2, we additionally estimated the independent contribution of (a) positive and (b) negative received social support with PSS. In Model 3, we additionally entered ED threat perceptions to Model 2 to test whether degree of threat perception in the ED partially mediated any association between received social support in the ED based on Baron & Kenny's guidelines (Baron & Kenny, 1986).

In a sensitivity analysis, in order to lessen the influence of current PSS on recall of ED social support characteristics, we tested all models in only participants who completed their second interview within 3 days of ED enrollment. Further, we additionally adjusted for recall of ED threat (the identical threat measure, assessed retrospectively at the second interview), as an index of the influence of current PSS on recall for participants' ED experience.

## Results

Participant characteristics are given in Table 1.

### Association of social support availability in the ED with subsequent PSS

Of the 484 total participants, 261 (54%) patients being evaluated for acute coronary syndrome had a social support provider present during their ED experience, and 90% reported that the relationship of the person with them was either very close or their closest relationship, but having a social support provider present was not a significant predictor of PSS ($B = -1.06$, $\beta = -0.04$, $p = .36$).

### Positive and negative social support

For participants who had a support provider in the ED, the experience of positive and negative aspects of social support were uncorrelated ($r = -.08$, $p = .24$), suggesting that the two dimensions were distinct.

### Association of positive received social support in the ED with subsequent PSS

Among participants who had a support provider present, although the full model explained a significant proportion of variance in PSS [Model 2; F(6, 249) = 2.92, p< .01; $R^2$adj = .04] positive received social support was unrelated to subsequent PSS (B = −.23, β = −0.02, p = .73). In two subsequent regression models replacing the positive social support score with each of the 2 individual items that comprised the scale, neither the degree to which the support provider was able to provide comfort (B = −1.01, β = −0.06, p = .40) or be responsive to the participant's needs (B = 1.03, β = 0.04, p = .58) was significantly associated with PSS in Model 2.

### Association of negative received social support in the ED with subsequent PSS

Multiple regression results are given in Table 3. Among participants who had a support provider present, the model including negative received social support with demographic and clinical variables explained a significant proportion of variance in PSS [Model 2; F(6, 254) = 4.57, p< .001; $R^2$adj = .08], and negative social support was independently associated with PSS (B = 1.20, β = 0.16, p = .01). In two subsequent regression models replacing the negative social support score with each of the 2 individual items that comprised the scale, the extent to which participants' support provider caused the participant anxiety was independently associated with increased PSS (B = 2.72, β = 0.16, p = .02). The extent to which participants had to comfort their support providers was not significantly associated with PSS (B = 0.52, β = 0.05, p = .83).

### Mediation test

We tested whether increased threat perception in the ED partially mediated the association of negative social support with subsequent PSS. Perceived ED threat was significantly correlated to both negative social support ($r$ = 0.18, $p$ = 0.002) and PSS ($r$ = 0.42, $p$ < 0.001) (Table 2). After adjustment for clinical and demographic variables, we found that ED threat perceptions (B = 1.32, β = 0.37, p < 0.001) significantly predicted PSS and attenuated the association of negative social support with PSS by 47% (with ED threat included, B = .70, β = 0.10, p = 0.10). Sobel's test of the indirect effect (2.17, p = .03) suggested that the mediation effect was significant.

### Sensitivity analysis

Of the 261 participants who had a social support provider in the ED, 137 (52%) completed their second interview within 3 days of ED enrollment and retrospectively reported on their ED threat perceptions at the second interview. After adjustment for demographic and clinical variables, and discrepancy between threat perceptions assessed during the ED stay and recall for those perceptions at the second interview, the association of negative social support with PSS was significant (B = 1.12, β = 0.15, p = 0.02). In the mediation model adjusted for recall bias, both threat perceptions assessed in the ED (B = 1.65, β = 0.45, p < 0.01), and the degree of discrepancy in threat perceptions from the ED to the second interview recall (B = −1.08, β = −0.31, p = 0.01) were significantly associated with PSS. The association of negative social support with PSS in that model was attenuated by 55% (with ED threat

included, B = .50, β = 0.07, p = 0.24) The mediation effect was statistically significant (Sobel = 2.23, p = .02).

## Discussion

We assessed the influence of positive and negative received social support in the ED during a potentially life threatening medical event on subsequent PSS. Our primary hypothesis was that social support would be significantly associated with subsequent ACS-induced PSS symptoms. Specifically, we hypothesized that the presence of social support would be protective against the development of subsequent PSS. Further, we hypothesized that attentive, comforting social support would be very protective and that negative, anxiety-inducing social support would be less protective. We found that neither the presence nor the positive aspects of social support in the ED were associated with subsequent PSS. On the other hand, negative social support that caused ACS patients to feel anxious was significantly associated with increased PSS at follow-up in these patients. The effect of negative social support was independent of demographic (age, sex) and clinical (GRACE risk score, Charlson comorbidity index) variables. As we expected, the relationship between negative social support and PSS was partially explained by increased perception of threat during ED evaluation. Importantly, we used real-time assessment of threat perceptions in the ED.

We assessed participants' perceptions of the social support they received in the ED at the follow-up interview at which PSS were assessed, out of concern for validity of responses with family or friends standing nearby. Although current PSS at the second interview did not influence reports of other dimensions of social support, to ensure that our findings were not due to the influence of current PSS on retrospective reports of social support dimensions, we conducted a sensitivity analysis restricted to participants who completed the second interview within 3 days of the ED interview. Further, we adjusted for the magnitude of retrospective bias by including a term for the discrepancy between identical ED threat questionnaires – the first completed with reference to current threat perceptions during participant enrollment and the second a recall of threat perceptions in the ED completed at the follow-up interview. Although this index of retrospective bias is not perfect, it does to some degree adjust for participants' exaggeration of negative aspects experience in the ED due to current PSS. Findings from the sensitivity analysis were similar to, and slightly more robust than, the primary analysis and lend further support to the notion that anxiety-provoking social support in the ED during a potentially life-threatening medical event contributes to risk for subsequent psychological disruption, rather than post-ED distress causing participants to misremember their social support experiences.

PTSD is a debilitating condition that is common after acute cardiac events, and is associated with cardiac event recurrence and mortality in acute coronary syndrome patients (who comprised 1/3 of the present sample). Our study is among the first to demonstrate the impact of psychosocial variables such as social support on the development of PSS in ED patients. These findings illustrate how interpersonal interactions that make cardiac patients feel anxious while they are in the ED lead patients to perceive their ED environment as more life

threatening and less controllable. This perception then thereby increases the severity of subsequent PSS, and potentially PTSD, after their hospitalizations.

## Limitations

Some limitations to the study must be acknowledged. First, although our assessment of PSS, clinical variables, and the presence of social support was excellent, the simplistic assessment of participants' perceptions of positive and negative aspects of social support did not yield strong scales, and single items measures can be unreliable. Although we assert that the limitations of assessment in the ED environment justify using such measures, and we repeated all analyses with both 2-item scales and single items, these potential reliability issues remain.

Second, although we adjusted for demographic and clinical variables known to be associated with PSS, other individual characteristics could provide alternative explanations to the observed findings. For example, Type D personality, defined as the tendency towards negative affectivity and social inhibition, has been associated with more than a four-fold increased risk of PTSD in post-myocardial infarction patients (Pederson & Denollet, 2004). It is possible that the patients in our analysis that developed PSS have Type D personalities, and are thus more likely to evaluate their social relationships negatively. Future studies should control for clinically relevant personality characteristics.

Third, although all participants were recruited into the REACH study during evaluation for ACS in the ED, only about one third were determined to have experienced a true ACS event upon retrospective chart review by a trained clinical nurse. We have found, however, that non-ACS and ACS patients alike perceive their health events in the ED as threatening and painful. Edmondson et al. (2013) also recently found that the association between ACS-induced PTSD symptoms and ED crowding was independent of ACS severity.

Fourth, as the REACH study was initiated before the *DSM-V* was published, our findings reflect the definition of PSS and predictors of PTSD as defined by *DSM-IV*. Future research is needed to confirm our findings with *DSM-V* criteria for trauma- and stressor-related disorders.

Finally, given the cross-sectional nature of our study, it is not possible to discern directionality of effects between negative social support and PSS outcomes. Although we hypothesize that negative social support increases the risk of developing PSS, it is possible that individuals with PSS are more likely to evaluate their social relationships negatively. However, our sensitivity analyses and adjustment for retrospective bias yielded findings that were similar to, and slightly more robust than, the primary analysis. Furthermore, longitudinal studies support the directionality we hypothesize, as social support resources have been shown to operate as antecedents of well-being and low social support increases subsequent psychological distress (Kaniasty & Norris, 2008). In samples of depressed patients, the availability of and satisfaction with social support resources predicts changes in depressive symptoms, but initial depression does not predict changes in social support (Krause, Liang, & Yatomi, 1989; Moos, Cronkite, & Moos, 1998). In regards to posttraumatic stress disorder (PTSD), two prospective studies indicate that the quality of

social support predicts the severity of PTSD 3 months later in victims of aggression (Zoellner, Foa, & Brigidi, 1999), 6 months later in victims of violent crimes (Andrews, Brewin, & Rose, 2003), and 1 and 6 months later in ACS patients (Marke & Bennett, 2013b). Joseph & Williams (2005) propose that an explanation for this temporal relationship may be social support's inhibition of cognitive-emotional processing of the traumatic event; that is, social support may impede or promote the process by which individuals successfully incorporate new trauma-related information into their preexisting beliefs and models of the world (Brewin, Dalgleish, & Joseph, 1996). The findings of the current study make sense in the context of this model, as we found that negative social support that makes a patient feel anxious in the ED is associated with the patient's appraisal of the ED experience as more life threatening. This appraisal may make it more difficult for the patient to integrate the traumatic event into his or her core theoretical assumptions about the world and him or herself, thereby forming the basis for the re-experiencing phenomena of PSS (Guay, Billette, & Marchand, 2006). Nonetheless, the temporality of our cross-sectional findings should be confirmed with longitudinal research.

Despite these limitations, we believe that our investigation contributes to and extends existing literature about social support and health. Our findings demonstrate the nuanced ways in which ACS patients in the ED experience their illnesses within larger social networks. Social relationships, even when positive, may not benefit individuals and can entail costs in addition to their frequently touted rewards. Social support, therefore, should be understood as a "double-edged sword" (Revenson et al., 1991).

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## Table 1

Participant characteristics (N = 484)

| | Social Support Present N = 261 | No Social Support N = 223 |
|---|---|---|
| *Demographic and Clinical Variables* | | |
| Age * | 61.3 ± 13.4 | 57.7 ± 11.6 |
| Male, N (%) * | 125 (48%) | 134 (60%) |
| GRACE risk score | 93.4 ± 30.7 | 88.5 ± 29.6 |
| Charlson comorbidity score | 1.9 ± 2.2 | 1.8 ± 2.0 |
| *Positive Social Support* | | |
| How much of the time was your support person able to comfort you? | 4.59 ± 0.9 | – |
| How much of the time was your support person responsive to your needs? | 4.80 ± 0.6 | – |
| *Negative Social Support* | | |
| How much of the time did your support person need you to comfort them? | 1.99 ± 1.4 | – |
| How much of the time did your support person make you anxious? | 1.30 ± 0.8 | – |
| *Psychiatric Impact* | | |
| ED Threat Perception in ED * | 10.49 ± 3.8 | 11.28 ± 4.5 |
| ASDS Score | 30.88 ± 13.7 | 32.65 ± 13.5 |

* Values are significantly different based on whether participants had a support provider present.

**Table 2**

Pearson correlation matrix

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1. PSS | - | | | | | | | | |
| 2. Age | −.24* | - | | | | | | | |
| 3. Gender | −.04 | −.01 | - | | | | | | |
| 4. GRACE risk score | −.20* | .82* | .10 | - | | | | | |
| 5. Charlson comorbidity index | −.12* | .26* | .10 | .48* | - | | | | |
| 6. Perceived ED threat | .42* | −.26* | −.11* | −.26* | −.16* | - | | | |
| 7. Positive social support: Comforting | −.07 | .10 | .04 | .11* | .14* | −.17* | - | | |
| 8. Positive social support: Responsive | −.03 | .10 | .04 | .09 | .12* | −.11* | .58* | - | |
| 9. Negative social support: Required comfort | .09 | −.04 | .17* | −.06 | −.05 | .09 | .07 | .04 | - |
| 10. Negative social support: Anxiety-inducing | .17* | .01 | .09 | −.02 | −.05 | .18* | −.23* | −.23* | .30* |

* *p*-values < .05

**Table 3**

Multiple regression analysis for effects of negative social support and perceived threat in the emergency department on subsequent PTSD symptoms

| Predictor Variables | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| | B (95% CI) | β | *p* | B (95% CI) | β | *p* | B (95% CI) | β | *p* |
| Age | −.28 (−.50, −.05) | −.27 | .02 | −.29 (−.51, −.07) | −.29 | .009 | −.21 (−.42, −.002) | −.21 | .05 |
| GRACE risk score | .02 (−.08, .13) | .05 | .66 | .03 (−.08, .14) | .07 | .58 | .03 (−.07, .13) | .08 | .50 |
| Charlson comorbidity index | −.43 (−1.31, .45) | −.07 | .33 | −.39 (−1.25, .48) | −.06 | .38 | −.25 (−1.06, .57) | −.04 | .55 |
| Gender | −1.28 (−4.60, 2.05) | −.05 | .45 | −1.78 (−5.07, 1.51) | −.07 | .29 | −.51 (3.63, 2.60) | −.02 | .75 |
| Negative social | - | - | - | 1.20 (.28, 2.11) | .16 | .01 | 0.74 (−.14, 1.61) | .10 | .10 |
| Perceived ED threat | - | - | - | - | - | - | 1.32 (.90, 1.74) | .37 | <.001 |