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Posttraumatic Stress Disorder (PTSD) Symptoms in Newly Diagnosed Head and Neck Cancer Patients and their Partners

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Abstract

Background—Head and neck cancer is a life threatening illness requiring aversive treatments. Despite clear potential for posttraumatic stress disorder (PTSD) symptoms in both patients and their partners, research is scant.

Methods—Newly diagnosed patients and partners (no. of dyads=42) completed questionnaires to assess symptoms of PTSD, anxiety, and depression, as well as demographic, medical, and attitudinal variables.

Results—Partners had higher average levels of PTSD symptoms than patients ($p=.023$). More partners (28.6%) met criteria for estimated PTSD caseness than did patients (11.9%). There were no significant differences in levels of other anxiety or depression symptoms. Perceived threat of

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disease appears to be a stronger correlate of PTSD symptom levels than medical variables in patients and partners.

Conclusions—A diagnosis of head and neck cancer elicits significant levels of PTSD symptoms in patients, and even higher levels among partners. Identified correlates of distress, including perceived threat of disease, are potential intervention targets.

Keywords

Stress; PTSD; couples; blame; head and neck cancer

INTRODUCTION

It is estimated that over 40,000 people will receive a new diagnosis of head and neck cancer in 2013 in the United States, with the majority diagnosed at intermediate or advanced stages.¹ In addition to the threat to life, head and neck cancer is a physically and emotionally challenging disease that can profoundly affect patients' quality of life and psychosocial function.^{2,3} Patients must cope not only with the diagnosis of a life threatening disease, but also confront treatments that can result in altered facial appearance and impairment of bodily functions such as speech, eating, swallowing and taste.⁴ Heightened levels of emotional distress, depression and anxiety have been widely documented in head and neck cancer patient samples^{5–7}, with various studies reporting 20% – 46 % incidence rates for clinically significant distress.^{8–10} Heightened emotional distress, as well as symptoms of anxiety and depression have also been documented in family caregivers (mainly partners) of patients with head and neck cancer, consistent with the many challenges that life threatening disease and its treatment thrust upon them (see Longacre et al 2012 for review). Indeed, several studies of patient-partner dyads have found symptom levels of anxiety and depression in the partners of head and neck cancer patients to similar to or even higher than in the patients themselves.^{7, 11–13}

Despite the life threatening nature of a diagnosis of head and neck cancer, little research attention has been paid to a particular type of anxiety, namely posttraumatic stress symptoms or full-blown posttraumatic stress disorder (PTSD) in these patients or in their partners. PTSD is a psychiatric disorder which can develop after exposure to a traumatic event that involves the threat of serious injury or death to oneself or others, and it is characterized by heightened arousal, intrusive thoughts, emotional numbness and avoidance of reminders of the traumatic event.¹⁴ A diagnosis of cancer was added as a qualifying traumatic event for a diagnosis of PTSD by the American Psychiatric Association in 1994 (DSM-IV).¹⁴ However, cancer is a multifaceted experience, potentially starting from diagnosis and extending through treatment, post-treatment, and survival¹⁵ and in this way it may differ from traditional traumatic events, such as war, that have formed the bulk of past research. Nonetheless, over the past two decades, considerable research with other cancer patient populations has established that PTSD symptoms following a cancer diagnosis, as for other traumatic events, are distinct from depression or general anxiety in that symptoms occur in response to a specific threatening event and include specific responses to triggers reminding the person of the event, although there is some comorbidity between PTSD and these other mood disorders.¹⁶ The potential clinical implications of PTSD in cancer patients

are suggested by accumulating evidence that PTSD can have particularly pernicious health-related consequences, including increased sensitivity to pain and other physical health symptoms, as well as increased morbidity and mortality.^{17–19}

The purpose of the present study was to use a well validated self-report measure (the *PTSD Checklist (PCL)*)²⁰ to describe and compare the severity of PTSD symptoms and the prevalence of individuals meeting criteria for a clinical diagnosis of PTSD in a sample of newly diagnosed head and neck cancer patients and their partners. We anticipated that not only would patients experience PTSD symptoms in response to a new diagnosis of head and neck cancer, but their partners would as well, given the dyadic relationship, thus adding a novel component to the study. We also examined symptoms of anxiety and depression as likely correlates of posttraumatic stress disorder symptoms. Finally, we examined demographic, medical, and psychological factors, including perceived threat and self-blame, as a first critical test of potential risk factors for the development of PTSD in head and neck cancer patients and their partners.

MATERIALS AND METHODS

Sample

Patients and their partners were recruited from the Head and Neck Oncology Clinic, University of Pittsburgh Medical Center. Patients were newly-diagnosed (within sixteen weeks) with upper aerodigestive tract cancers, stages I-IV, without distant metastases. Eligibility criteria included having a partner (spouse or significant other, as identified by the patient) who was also willing to participate in the study. All participants met additional inclusion criteria (English-speaking, with no history of prior cancer diagnosis and no history of psychotic disorder as indicated by medical chart).

Procedure

The study had University of Pittsburgh Institutional Review Board approval. Participants were approached about the study and provided written informed consent at the time of a routine clinic appointment. Participants were given paper and pencil self-report measures to complete and returned them in person, or by prepaid mail. Patients and partners were instructed to complete the measures independently and were provided with separate return envelopes.

Measures

Sociodemographic information was obtained from all participants. Medical information was obtained from patient medical records.. Both patients and partners completed validated self-report psychosocial measures.

Posttraumatic Stress Symptoms—The *PTSD Checklist-Civilian Version*²⁰ (PCL) is a 17-item questionnaire that assesses number and severity of traumatic stress symptoms, including intrusive negative thoughts, avoidance of negative thoughts and behaviors, and hyperarousal symptoms experienced in the past month. Each item is rated on a 5 point scale from “not at all” to “extremely.” A total summed score was calculated (possible range 17–

85; Cronbach's $\alpha = .95$ in the present sample). The PCL was also used to estimate whether a participant met DSM-IV criteria for PTSD caseness, based on the cluster method, which follows the criteria of endorsing a certain threshold level of symptoms in each of the three symptom clusters (intrusion, avoidance, and hyperarousal) that mirror the DSM-IV.²⁰ The PCL has shown good agreement with both the PTSD module of the Structured Clinical Interview for DSM-IV²¹ and the Clinician Administered PTSD Scale²² and has demonstrated validity in cancer populations¹⁶. Participants reported on symptoms experienced as a result of learning of their own or their partner's cancer diagnosis.

Anxiety and Depression Symptoms—The *Hospital Anxiety and Depression Scale* (HADS)²³ contains two 7-item subscales to measure anxiety and depression and is widely used in medical populations ($\alpha = .91$ and $.80$ for anxiety and depression, respectively, in the present sample).

Potential correlates of Posttraumatic Stress Symptoms—In addition to considering HADS anxiety and depression symptoms as potential correlates of PTSD symptoms, we also assessed patient and partner psychological, clinical, and sociodemographic factors that we hypothesized would serve as correlates. *Perceived threat* was assessed using a 3-item measure adapted from Witte, Cameron, McKeon and Berkowitz.²⁴ Participants rated items concerning how serious, life threatening, and threatening to their well-being their (or their partner's), condition was (1=not at all; 5=extremely threatening). Items were averaged ($\alpha = .81$ in the present sample). Disease-related blame was assessed using measures from Christensen and colleagues'²⁵ work in head and neck cancer populations. *General blame* was assessed by asking participants to rate the "extent to which you believe your (your partner's) cancer was caused by you (your partner's) own actions" (1 = not at all, 5 = completely) and *substance use-related blame* was assessed by asking participants to rate the "extent to which you believe your (your partner's) cancer was specifically caused by tobacco or alcohol use" (1 = not at all, 5 = completely). Because we were interested in the relationship between substance use-related blame and traumatic stress symptoms, we also assessed self-reported use of tobacco and alcohol with five questions adapted from the Fagerstrom Tolerance Questionnaire regarding regular tobacco use at any time during the respondent's lifetime.²⁶ Thus, we used the yes/no questions "Do you currently smoke cigarettes" and "Do you currently use other tobacco products such as cigars, pipes, or chewing tobacco" followed by similar questions about past use (e.g., "Was there ever a time when you smoked cigarettes on a regular basis"). Participants were identified as lifetime tobacco users if they endorsed any of these items. Alcohol use was assessed with the yes/no question "Do you currently drink alcohol, or has there ever been a time in your life when you did drink alcohol on a regular basis?"

Clinical variables—We abstracted clinical information, including severity of disease defined by stage (I-IV), whether patients underwent surgical treatment (yes/no), other treatments (chemotherapy, radiotherapy), disease site, time since diagnosis, time since treatment onset, and whether patients were on treatment or completed treatment. *Physical disfigurement and dysfunction* was rated by the patient's surgeon for all patients using the

Observer-rated Disfigurement Scale ²⁷, a single-item nine-point Likert scale that has been validated in head and neck populations receiving different types of treatment.

Data Analysis

Paired t-tests (for continuous variables) and McNemar's χ^2 tests (for dichotomous variables) were conducted to compare patients and partners on PCL scores and PTSD caseness, as well as depression and anxiety scale scores. Similar tests were performed to compare patients and partners on background characteristics and levels of perceived threat, and general and tobacco/alcohol-related blame. Correlation coefficients were calculated to examine bivariate relationships between variables (perceived threat, general blame, disease severity, surgical treatment, degree of disfigurement, whether patients were on treatment or finished with treatment, number of days since treatment onset, age, gender, education level and income level) and PCL scores. Potential correlates of posttraumatic stress symptoms were subsequently examined using multiple linear regression analyses. Data analysis was conducted using IBM SPSS version 20. Because of skewness, scores on the PCL and the Observer-rated Disfigurement Scale were log transformed prior to analyses in order to normalize their distributions.

RESULTS

Participants

Among 65 patient-partner dyads approached, 45 patients and their partners were enrolled. Of the remainder, either the patient (n=18) or partner (n=2) refused to participate, primarily due to time or other constraints. Among the 45 enrolled dyads, 3 dyads returned data from only one member (2 partners, 1 patient). Thus, the final sample included 42 dyads. As shown in Table 1, most participants were European-American and were educated beyond high school. Most dyads were married (n=37 dyads, 88%), and all were male-female pairs. The majority of patients were male (n=32, 76%). (Potential demographic correlates of the outcomes are considered below.) About half of the participants (52%) were diagnosed with pharyngeal head and neck cancer, and the majority (62%) had stage IV disease. The majority of the patients underwent surgical treatment either alone or in combination with chemoradiation. The average Disfigurement rating was 2.17 (for patients undergoing surgery, mean=2.46 (2.1)) and most patients (n=26, 62%) were given the lowest rating of 1 on the 1–9 scale, indicating minimal disfigurement. Participants completed assessments an average of 9.5 weeks postdiagnosis (mean = 67 days $\pm$ 28.7 days post diagnosis; range of 28 days – 112 days).

PTSD symptoms

As shown in Table 2, PTSD symptoms, as measured by the PCL, were endorsed by both patients and their partners, and partners had significantly higher PTSD symptom levels than patients. Patients' and partners' traumatic stress scores were not significantly correlated with one another ($r = .04$; $p = .821$).

Using the cluster method to classify estimated PTSD cases, 5/42 (11.9%) of patients met criteria and 12/42 (28.6%) of partners met criteria (Table 2). A higher percentage of partners

met estimated PTSD caseness than patients, although this was not significant. There was no dyad in which both the patient and the partner met estimated PTSD caseness. Three of the 5 patients (and 5 of the 12 partners) who met estimated criteria for PTSD were receiving cancer treatment at the time of assessment. Closer inspection of the three specific symptom clusters of PTSD (intrusion, avoidance, and hyperarousal) revealed that patients and partners endorsed more symptoms of intrusion, with the majority of partners (59%) meeting the intrusion cluster criteria, i.e., endorsing threshold severity, and 38% of patients also meeting this criteria. However, partners also endorsed more avoidance and hyperarousal symptoms when compared to patients, although this did not reach statistical significance.

Anxiety and depression symptoms

Both patients and partners reported higher levels of anxiety symptoms than depression symptoms (see Table 2). As shown in the table, patients' and partners' average symptom levels did not differ from each other. In addition, their scores were not highly correlated with each other (anxiety, $r=.24$, $p=.241$; depression, $r=.01$, $p=.930$). Scores on the HADS anxiety and depression subscales of 11 and above indicate probable psychiatric distress; over one fourth of patients and nearly one half of partners met this criterion on the anxiety subscale. Patients and partners were less likely to meet this criterion on the depression scale, with less than 5% of each group endorsing probable depressive distress. Further, of the 5 patients with estimated PTSD caseness, 3 also met criteria for anxiety caseness and 1 met criteria for both anxiety and depression caseness. Of the 12 partners with estimated PTSD caseness, 10 also met criteria for anxiety caseness and 1 met criteria for both anxiety and depression caseness.

Correlates of PTSD symptoms

We first examined correlations among PTSD symptoms, anxiety and depression. In both patients and partners, PCL scores were significantly related to both their HADS anxiety scores as well as HADS depression scores (for patients, anxiety, $r=.76$, $p=.001$, depression, $r=.42$, $p=.006$ and for partners, anxiety, $r=.81$, $p=.001$; depression, $r=.74$, $p=.001$). Although HADS anxiety scores were correlated with estimated PTSD caseness in both patients and partners ($r=.50$, $p=.001$ and $r=.60$, $p=.001$ respectively), HADS depression scores were only related to estimated PTSD caseness in partners ($r=.44$, $p=.003$) and not in patients ($r=.26$, $p=.098$).

Regarding other potential correlates of PTSD symptoms, we first examined group differences between patients and partners on perceived threat and general blame, as well as group differences in substance-related blame in the subset of dyads in which the patient reported a lifetime history of tobacco use (Table 3). As shown in the table, there was no difference between patients and their partners in levels of perceived threat associated with cancer. Further, patient and partner perceived threat scores were correlated with one another ($r=.40$, $p=.008$). Regarding blame, on average, patients were marginally more likely to blame themselves for their disease than were their partners to assign them blame. In addition, patients' and partners' scores were correlated with each other ($r=.68$; $p=.001$) indicating that if patients blamed themselves, their partners were likely to blame them as well. For substance-related blame, we examined the subset of patient-partner dyads in which the patient reported a history of tobacco use ($n=30$ dyads). As shown in Table 3, patients and

their partners reported similar mean levels of substance-related blame for the patient's disease. Moreover, their blame scores in this area were highly correlated with each other ($r=.69$; $p=.001$).

We next examined whether perceived threat, blame or the sociodemographic and medical factors were associated with PTSD symptoms. We first calculated simple correlations for each of the potential predictors with the patients' total PCL scores and the partners' total PCL scores, as shown in Table 4. In partners, PTSD symptoms were significantly correlated with their rating of perceived threat to the patient ($r=.38$, $p=.012$), indicating those partners who viewed their patients diagnosis as more threatening also experienced more severe PTSD symptoms. This correlation was weaker and not significant in patients ($r=.26$, $p=.093$). Disease-related general blame, stage of disease, whether the patient underwent surgery (yes/no), degree of disfigurement, being on treatment, and days since treatment onset were unrelated to patient's and partner's PCL scores. Finally, age was not related to PCL score in patients ($r=-.12$, $p=.460$), but was negatively related to PCL score in partners ($r=-.32$, $p=.036$), indicating that younger partners experienced higher levels of traumatic stress symptoms. All other demographic characteristics (gender, education, and income) were not significant.

In the subset of dyads with patients who reported lifetime tobacco use ($n=30$) we examined whether substance-related blame was related to PTSD symptoms. Substance use-related blame was significantly related to PTSD symptoms in partners ($r=.42$; $p=.022$) but was unrelated in patients ($r=.12$; $p=.521$). Thus, for this subsample of 30 dyads, partners who blamed the patient's tobacco and alcohol use for the disease had higher levels of PTSD symptoms.

Given the sample size and the need to ensure an appropriate ratio of study participants to variables considered in multivariate analysis, only potential correlates with a correlation coefficient that was at least modest size ($r \geq .25$) were included in a multiple regression analysis with PCL total score as the outcome. Thus for patients, the perceived threat score and gender were included in the regression. Although they as a set showed a trend for a relationship to PCL total score, ($F(2, 39) = 3.035$, $p=.06$; $R=.37$), neither variable alone remained a reliable independent correlate of PCL score (see Table 4). For partners, the perceived threat score, whether they were on treatment, and age were included in the regression analysis and they as a set were significantly related to PCL total score, ($F(3, 38) = 4.983$, $p=.005$; $R=.53$). Of the three predictors, only perceived threat and whether they were on treatment were significant on its own.

DISCUSSION

The partners of recently diagnosed patients with head and neck cancer, as well as the patients, reported experiencing PTSD symptoms. Indeed, levels of PTSD symptoms were significantly higher for partners than for patients. This pattern was not seen for depression or general anxiety symptoms, suggesting that partners of patients with head and neck cancer may be particularly at risk for the development of more severe PTSD symptoms. Consistent

with this view, over two times as many partners met criteria for estimated PTSD diagnosis than did the patients themselves, although this did not reach statistical significance.

We found that 11.9% of patients met criteria for estimated PTSD based on their PCL scores. To our knowledge, this is the first report in the literature that has focused on PTSD in the specific context of head and neck cancer patients and their partners. However, in a mixed patient sample that included some individuals with this type of cancer assessed 6 months post diagnosis, Kangas and colleagues found a rate of 22%.²⁸ Further, our incidence of 11.9% is in the range, albeit lower end, of that found in other types of cancer such as breast cancer (11.2%–18.5%)²⁹ and gynecologic cancer patients (16–34%).³⁰ It is unclear whether the timing of our assessment and/or the patient characteristics (e.g., both male and female genders) may have affected our percentages of PTSD caseness compared with prior work in other cancer populations. A larger proportion (28.6%) of our partners met criteria for estimated PTSD. Because most of our partners were female, we explored the possible contribution of gender to both PCL score and estimated PTSD caseness and found no reliable relationship. Therefore, regardless of gender, partners experienced greater PTSD symptoms than patients, although it is noted that our sample size is small.

As has been generally established in the literature, perceptions of threat are key in the development of traumatic stress.^{31–32} We found that patients and partners who believed their or their partner's disease to be more threatening also reported the most traumatic stress, and perceived threat was our strongest correlate of traumatic stress, surpassing the objective disease indices that we measured in this preliminary work. Although others have found relationships between level of disfigurement and general distress³³, we did not find this in our sample using PTSD symptoms as our outcome. However, our sample tended to have low levels of disfigurement, perhaps due to advances in surgical techniques. The relationship between blame and PTSD symptoms remains unclear. We did not find any reliable relationship between general blame and PCL scores in either patients or partners although substance-related blame was positively related to PTSD symptoms in the subset of partners of patients with a history of substance use; this same relationship was not found in these patients themselves.

Our assessment occurred relatively soon after diagnosis, between 4 weeks and 16 weeks post-diagnosis. This post-diagnosis time period is important because patients are likely making medical decisions and engaging in treatment, and heightened traumatic stress may negatively impact decision-making and adherence to treatment regimens. Similarly, partners may be involved in treatment decisions as well as providing emotional and tangible support to patients, in addition to maintaining their family and work obligations, and perhaps taking on additional family responsibilities from the patient. This increase in burden, coupled with the threat of losing their loved one, may have contributed to partners' higher level of traumatic stress as compared to patients' levels. In previous work, caregivers, (comprised mostly of partners), of head and neck cancer patients reported higher levels of concern about recurrence than patients³⁴ and showed long-term difficulties in psychological adjustment, with distress higher than the general population.³⁵ Further, some evidence suggests that female partners of head and neck cancer patients are at risk for anxiety disorders, particularly agoraphobia.³⁶ Finally, the implications may be long term for the relationship;

head and neck patients and partners who have greater baseline distress had worse communication and lower levels of intimacy over time in one recent study.³⁷

PTSD symptomatology, such as avoidance, may be an especially important issue for head and neck cancer patients and their partners as it may impact health behavior, along with generalized anxiety and depression. Head and neck cancer patients often endure difficult treatments that can result in difficulties in daily living activities (e.g., eating, speech)⁴ and in one study about one third of patients undergoing radiotherapy were not adherent to treatment.³⁸ Another hallmark symptoms cluster of PTSD, intrusive thoughts, was found to be related to physician reported poor medical adherence in other medical populations (e.g., heart transplantation recipients).³⁹ Psychological interventions to decrease distress in head and neck patients (see Lockett, Britton, Clover, & Rankin, 2011 for review)⁴⁰ and specifically to reduce PTSD symptoms in head and neck cancer patients have shown some promise⁴¹, and more work is needed to further develop these interventions, and expand them to target patients' partners.

Although this study's relatively close temporal time frame to diagnosis and inclusion of patients' partners are key strengths, the cross-sectional design and small sample size allow for limited inferences regarding causative processes or an examination of PTSD at other phases of illness, and limited our ability to identify reliable correlates. While we were able to examine correlates of our continuous measure of post-traumatic stress symptom levels, our sample was too small to begin to examine, for example, characteristics among participants who met estimated PTSD criteria. The preliminary nature of this work, and the preponderance of advanced stage patients who were male (with female partners) in our sample, precludes strong conclusions about the relationships between posttraumatic stress symptoms and gender, range of disease stage, or disfigurement; these would be important areas for future work. Further, we were unable to examine the impact of type of surgery, reconstruction, disease site, and other comorbidities on PTSD symptoms as well. We were unable to determine whether participants had a pre-existing history of anxiety and/or mood disorders, or had utilized psychotropic medications or psychosocial services, all of which may have affected current PTSD symptom reporting. We used a self-report measure, the PCL, to assess PTSD symptoms. Although the PCL is widely used in cancer populations and has demonstrated good agreement with the Structured Clinical Interview for DSM-IV²¹, which is a well-established method of assessment, we nonetheless are limited by its self-report nature. It is also possible that despite instructions to report on intrusive thoughts related to cancer diagnosis, participants may have been reporting on intrusive thoughts about future events (e.g., future treatments), given the nature of cancer. Finally, the correlations between the HADS and PCL are high, particularly for anxiety. Although this suggests an overlap of some elements of the PCL and HADS, it also suggests that other elements of the PCL are tapping something distinct that is not contained in the HADS.

In conclusion, the emotional sequelae of cancer diagnosis can be traumatic for some patients, and may go beyond the patient. The fact that PTSD symptoms are experienced by patients, and even more so by partners, as a result of head and neck cancer diagnosis suggests clinicians need to be aware of this type of reaction in their newly diagnosed patients, as well as their partners.

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Table 1

Background Characteristics of Participants (No. of participants=84)

Characteristic, no. (%)	Patient No. of patients=42	Partner No. of partners=42
Gender		
Male	32 (76)	10 (24)
Female	10 (24)	32 (76)
Age, mean; range (SD)	55; 35–77 (8.7)	53; 27–78 (11.3)
Ethnic group		
European American	41 (98)	42 (100)
African American	1 (2)	0
Highest education level		
high school	25 (60)	28 (67)
>high school	17 (40)	14 (33)
Current marital status		
Married	37 (88)	37 (88)
“Marriage-like” relationship	5 (12)	5 (12)
Annual family income		
> \$50,000*	22 (54)	--
Relationship duration, yrs, mean; range (SD)*	22; 1–58 (13.8)	--
Disease site:		
Larynx	4 (10)	--
Pharynx	22 (52)	--
Oral	13 (31)	--
Salivary	2 (5)	--
Unknown Primary	1 (2)	--
Stage:		
I	5 (12)	--
II	6 (14)	--
III	5 (12)	--
IV	26 (62)	--
Treatment:		
Surgery only	19 (45)	--
Surgery + radiation	3 (7)	--
Surgery + chemoradiation	6 (14)	--
Chemoradiation	14 (33)	--
On Treatment, yes	25 (60)	--
Days since treatment onset ^a , mean; range (SD)	37.8; 0–100; (30.6)	--
Degree of Disfigurement ^b , mean; range (SD)	2.17; 1–8 (1.9)	--
History of Tobacco Use, yes	30 (71)	25 (60)
History of Regular Alcohol Use, yes	29 (69)	17 (40)

* Obtained from the patient; income and relationship duration data missing for one dyad.

^aData missing for one patient

^bHigher scores are reflective of greater disfigurement

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Table 2

PTSD Checklist (PCL) Scores (mean, SD), Estimated PTSD Cases, and Hospital Anxiety and Depression Scale (HADS) scores (mean, SD) by Group (No. of participants=84)

Measure	Patients No. of patients=42	Partners No. of partners=42	Test Statistic	p
PCL Score ^a	29.6 (11.7)	35.8 (14.0)	t(41) = -2.35	.023
Estimated PTSD Cases, cluster method (no., %)	5 (11.9)	12 (28.6)	---*	.143
Met Cluster B (intrusion) criteria (no., %)	16 (38.1)	25 (59.5)	---*	.093
Met Cluster C (avoidance) criteria (no., %)	7 (16.7)	13 (31)	---*	.302
Met Cluster D (hyperarousal) criteria (no., %)	10 (23.8)	19 (45.2)	---*	.115
HADS Anxiety subscale	7.3 (4.4)	9.0 (5.1)	t(41) = -1.90	.065
Met Anxiety score cut off of 11 (no., %)	11 (26.2)	19 (45.2)	---*	.096
HADS Depression subscale	4.8 (3.2)	5.5 (3.5)	t(41) = -1.02	.316
Met Depression score cut off of 11 (no., %)	2 (4.8)	2 (4.8)	---*	1.0

^a scores were log transformed prior to analysis to reduce skewness in their distribution. Means based on raw scores are presented here to facilitate interpretation. Higher scores are reflective of greater PTSD symptoms.

* McNemar's test

Table 3

Perceived Threat, General Blame and Substance-related Blame Scores (mean; range, SD) by Group (No. of participants=84)

Measure	Patients No. of Patients=42	Partners No. of Partners=42	Test Statistic	p
Perceived Threat	3.6; 1.67–5, (0.8)	3.7; 1.67–5, (0.8)	t(41)= -.343	.734
General Blame	2.9; 1–5, (1.4)	2.5; 1–5, (1.3)	t(41)= 1.969	.056
Substance-related Blame ^a	3.0; 1–5, (1.3)	2.9; 1–5, (1.5)	t(29)= .162	.873

^a assessed in dyads consisting of patients with lifetime tobacco use (No. of dyads=30). Higher scores are reflective of greater threat and blame.

Table 4

Correlates of PTSD Checklist (PCL) total score ^a (No. of participants=84): Bivariate associations and multiple regression results.

	Patients (n=42) PCL		Partners (n=42) PCL	
	r	b	r	b
Psychological variables				
Perceived threat	.26	.235	.38*	.357*
General blame	-.06	---	.24	---
Clinical variables				
Disease severity (stage 1–4)	-.12	---	.05	---
Surgery, yes	-.14	---	.05	---
Disfigurement ^a (1–9)	-.24	---	.10	---
On treatment ^b	.02	---	-.28	-.290*
Days since treatment onset	-.16	---	-.05	
Participant characteristics				
Age ^c	-.12	---	-.32*	-.202
Gender ^d	-.28	-.258	.11	---
Education ^e	-.14	---	.07	---
Income ^f	-.07	---	.09	---

* p < .05

^a scores were log transformed prior to analysis to reduce skewness in their distribution.

^b On treatment coded 0=treatment completed, 1=on treatment

^c Age coded as continuous variable.

^d Gender coded 0=male, 1=female.

^e Education coded 0=high school graduate or less, 1=schooling beyond high school.

^f Income coded 0=under \$30,000, 1=\$30,000–70,000, 2=over \$70,000. Income data missing for one dyad

Regression coefficients are standardized.