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Does number of lifetime traumas explain the relationship between PTSD and chronic medical conditions? Answers from the National Comorbidity Survey-Replication (NCS-R)

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Abstract

The present study sought to extend prior research by using data from the National Comorbidity Survey Replication (NCS-R) to examine the relationship between number of lifetime traumas, PTSD and fifteen self-reported chronic medical conditions. The goal was to determine whether the commonly found relationship between PTSD symptomatology and physical health were better explained by the number of lifetime traumas experienced. The NCS-R is a representative U.S. household survey that assessed lifetime experience of a variety of traumas, lifetime diagnosis of PTSD and fifteen chronic medical conditions (e.g. pain conditions, cardiovascular disorders, etc.). Two major findings emerged: 1) there was a graded relationship between trauma exposure, PTSD, and the majority of chronic medical conditions where individuals with PTSD had the highest likelihood of chronic medical condition and non-traumatized individuals had the lowest risk and; 2) with the exception of headaches, the relationship between PTSD and chronic medical conditions was explained by the number of lifetime traumas experienced when analyses were subset to traumatized individuals. The present study supports prior research suggesting that multiple traumas have a cumulative effect on physical health. The impact of trauma on health may be independent of PTSD symptomatology.

Keywords

trauma; PTSD; chronic medical conditions; National Comorbidity Survey-Replication

Posttraumatic stress disorder (PTSD) affects 6.8% to 7.8% of the U.S. population during their lifetime (Cox, 2002; Kessler, Berglund, Demler, Jin, & Walters, 2005) and is recognized as an expensive form of psychiatric disability (Marciniak, Lage, Dunayevich, Russell, Bowman, Landbloom et al., 2005; Walker, Katon, Russo, Ciechanowski, Newman, & Wagner, 2003). According to one estimate, the annual cost of anxiety disorders in the U.S. was approximately \$42.3 billion in mental and physical health services, with PTSD ranking as the highest in terms of per person health care expenditures (Greenberg, Sisitsky, Kessler, Finkelstein, Berndt, Davidson et al., 1999). Further, the majority of the economic burden (54%) is due to direct *nonpsychiatric* health care costs such as primary care and emergency room visits (Greenberg et al., 1999). Numerous studies have shown a consistent association between PTSD and both self-reported measures of physical health such as chronic pain, back problems and general physical complaints (Asmundson, Coons, Taylor, & Katz, 2002; Beckham, Crawford, Feldman, Kirby, Hertzberg, Davidson et al., 1997; McWilliams, Cox, & Enns, 2003; Roy-Byrne, Smith, Goldberg, Afari, & Buchwald, 2004; Roy-Byrne, Noonan, Afari, Buchwald, &

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Goldberg, 2006; Vedantham, Brunet, Boyer, Weiss, Metzler, & Marmar, 2001; Wagner, Wolfe, Rotnitsky, Proctor, & Erickson, 2000; Wolfe, Schnurr, Brown, & Furey, 1994; Zoellner, Goodwin, & Foa, 2000) as well as a range of physician-diagnosed disorders such as cardiovascular/circulatory, autoimmune, musculoskeletal, digestive and respiratory disorders (Boscarino, 1997, 2004; Goodwin & Davidson, 2005; Kang, Bullman, & Taylor, 2006; Lauterbach, Vora, & Rakow, 2005; Sareen, Cox, Stein, Afifi, Fleet, & Asmundson, 2007; Sawchuk, Roy-Byrne, Goldberg, Manson, Noonan, Beals et al., 2005; Weisberg, Bruce, Machan, Kessler, Culpepper, & Keller, 2002).

PTSD is a unique disorder in that its diagnosis requires the experience of a trauma (American Psychiatric Association [APA], 1994). In fact, extant research has also demonstrated a robust relationship between trauma exposure and poor physical health (Hidalgo & Davidson, 2000; Norman, 2006; Schnurr, Spiro, Aldwin, & Stukel, 1998; Ullman & Siegel, 1996), with the development of PTSD following trauma exposure being posited as the primary mechanism through which trauma results in adverse health outcomes (for reviews see Friedman & Schnurr, 1995; Schnurr & Green, 2004). Some research has lent support to this theory in that after controlling for PTSD symptoms, the association between trauma exposure and subjective evaluation of physical health status became nonsignificant or was greatly reduced (Cloitre, Cohen, Edelman, & Han, 2001; Kimerling, Clum, & Wolfe, 2000; Lang, Laffaye, Satz, McQuaid, Malcarne, Dresselhaus et al., 2006; Norris, Slone, Baker, & Murphy, 2006; Vedantham et al., 2001; Wagner et al., 2000; Wolfe et al., 1994). For example, among female Vietnam veterans, the relationship between trauma exposure and poor subjective health status and global health perception became nonsignificant once PTSD symptoms were taken into account (Kimerling et al., 2000).

Alternately, research focused on the more direct role of trauma on physical health has suggested that it may be the cumulative effect of multiple lifetime traumas that translates into chronic medical conditions via chronic over-activation of the physiological stress pathways (i.e. hypothalamic-pituitary-adrenal axis, sympathetic nervous system) resulting in wear and tear to bodily systems (e.g. allostatic load) (McEwen, 1998; Vanitallie, 2002; Weiss, 2007). For instance findings from the Adverse Childhood Experiences (ACE) study suggest a graded relationship between trauma and disease where a greater number of childhood traumas predicted the likelihood of several adult diseases (i.e. heart disease, cancer, lung disease, skeletal fractures, and liver disease) (Dong, Dube, Felitti, Giles, & Anda, 2003; Dong, Giles, Felitti, Dube, Williams, Chapman et al., 2004; Felitti, Anda, Nordenberg, Williamson, Spitz, Edwards et al., 1998). Although the impact of PTSD was not examined in these studies, it is argued that PTSD symptomatology further increases allostatic load through a number of routes including prolonged and/or inadequate physiological responses to stress resulting in physical illness (Friedman & McEwen, 2004).

It remains unclear as to whether the relationship between cumulative trauma exposure and physical illness is specifically due to PTSD symptomatology. To date, research examining the relationship between PTSD and chronic medical conditions has generally failed to take the total number of lifetime traumas into account (Seng, Graham-Bermann, Clark, McCarthy, & Ronis, 2005). While epidemiological findings based on the original National Comorbidity Survey (NCS) showed that individuals with PTSD were at higher risk for a range of chronic medical conditions compared to individuals without PTSD (Lauterbach et al., 2005) and those with other anxiety disorders (Sareen, Cox, Clara, & Asmundson, 2005), trauma exposure was not taken into account. One study did examine the relationship between number of lifetime traumas, PTSD, and physical health among women with a history of childhood abuse (Cloitre et al., 2001). Results suggested that the relationship between the number of interpersonal traumas and *perceptions* of physical health was accounted for by PTSD symptomatology. In contrast, the number of interpersonal traumas experienced, and not PTSD symptomatology,

was a significant predictor of the number of physician-diagnosed medical problems (e.g. dermatological, cardiovascular, gastrointestinal problems) suggesting that the cumulative burden of lifetime traumas may lead to medical problems independent of PTSD symptomatology (Cloitre et al., 2001). Although this study was limited to a small sample of victimized women, it highlights the importance of taking total lifetime trauma exposure into account and how the role of PTSD symptomatology may vary across different measures of health (e.g. perceptions vs. doctor-diagnosed conditions).

Number of lifetime traumas may be an important confounder between the relationship between PTSD and chronic medical conditions since 1) individuals with PTSD are more likely to have experienced multiple traumatic events in their lifetime (Breslau, Chilcoat, Kessler, & Davis, 1999; Brewin, Andrews, & Valentine, 2000; Scott, 2007) and 2) multiple lifetime traumatic events have been related to chronic medical conditions (Cloitre et al., 2001; Dong et al., 2003; Dong et al., 2004; Felitti et al., 1998). The present study sought to extend prior research by using data from the National Comorbidity Survey Replication (NCS-R) (Kessler & Merikangas, 2004) to examine the relationship between number of lifetime traumas, PTSD and fifteen self-reported chronic medical conditions. The goal was to determine whether these associations are better explained by the number of lifetime traumas experienced as opposed to PTSD diagnosis. The NCS-R provides a unique opportunity to address this question within a nationally representative sample of men and women and across a range of trauma types and chronic medication conditions.

METHOD

Sample

A detailed description of the design and field procedures of the NCS-R has been previously presented (Kessler, Berglund, Chiu, Demler, Heeringa, Hiripi et al., 2004). Briefly, the National Comorbidity Survey Replication (NCS-R) is a nationally representative community household survey of mental illness conducted between February, 2001 and April, 2003 (Kessler & Merikangas, 2004). The NCS-R used a fully structured, lay-administered interview to assess a range of DSM-IV psychiatric disorders and other correlates among English speaking US citizens ranging in age from 18 to 87. Sampling for the NCS-R included the contiguous 48 states and was limited to persons living in non-institutionalized households and on campuses where respondents had permanent addresses. The overall response rate was 70.9% (Kessler et al., 2004). The NCS-R interview was administered in two parts. Part 1 included core diagnostic assessments completed by all participants (N= 9,282). Part 2 included assessments of potential psychiatric correlates and other psychiatric disorders. Part 2 was only administered to a subsample of Part 1 respondents, over-sampling those with clinically significant psychopathology (n=5,692). The assessment of trauma exposure, health behaviors, lifetime PTSD and chronic medical conditions were included in part 2. The present analyses included those participants completing Part 1 and Part 2 of the survey (N=5692). All field procedures were approved by the Human Subjects Committees of both Harvard Medical School and the University of Michigan and verbal informed consent was obtained from all respondents.

Measures

Lifetime psychiatric disorders—Lifetime psychiatric disorders were based on the World Mental Health Survey Initiative Version of the World Health Organization Composite International Diagnostic Interview (WMH-CIDI). Lifetime diagnoses included in the present analyses were anxiety disorders (PTSD, panic disorder, specific phobia, social phobia, and generalized anxiety disorder), MDD, and substance use disorders (alcohol abuse and dependence, drug abuse and dependence). As part of the PTSD protocol respondents were first asked about lifetime exposure to twenty-seven specific traumas (e.g. “Were you ever involved

in a life-threatening automobile accident?") and were given the opportunity to report other traumas that were not listed. Individual trauma items were summed to provide a total number of lifetime traumas experienced. Further, in order to control for the possibility that the traumatic event may have resulted in injury (e.g. chronic pain), the type of trauma endorsed was categorized into two types: primary and secondary. Primary traumas were those directly experienced by the respondent (e.g. assault, car accident) and secondary traumas were those that were witnessed by the respondent (e.g. child's illness, witness an accident). PTSD symptomatology was then assessed for respondents who endorsed experiencing at least one traumatic event. For respondents who endorsed more than one trauma, PTSD was assessed for their worst event as well as a randomly selected event that they experienced. Respondents were diagnosed with PTSD if they met diagnostic criteria for either their worst/only event or random event.

Chronic medical conditions—Respondents were asked whether they had ever experienced any of the following chronic medical conditions: arthritis or rheumatism, chronic back or neck pain, frequent or severe headaches, chronic pain, seasonal allergies, stroke, and heart attack. In addition, respondents were asked if they were ever diagnosed by a doctor or other health professional with any of the following chronic medical conditions: heart disease, high blood pressure, asthma, chronic lung diseases (e.g. chronic obstructive pulmonary disease or emphysema), diabetes or high blood sugar, stomach or intestinal ulcer, epilepsy or seizures, and cancer.

Sociodemographic Characteristics—Sociodemographic characteristics included in the models were age, gender, ethnicity (non-Hispanic white, non-Hispanic black, Hispanic or other), and yearly income.

Health-related behaviors—Research has shown that individuals with PTSD are less likely to have health insurance coverage (Lauterbach et al., 2005) and more likely to be smokers (Feldner, Babson, & Zvolensky, 2007). Health behavior variables included as covariates included health insurance coverage and smoking status. The presence or absence of health insurance was defined by aggregating six types of insurance including: military insurance, health insurance through an employer or union, insurance purchased directly through an insurance company, Medicare, Indian Health Service, and other. Respondents who reported past or current smoking were categorized as smokers while respondents who reported never smoking or only smoking a few times were categorized as non-smokers.

Statistical Analyses

Sample weights were used in each individual analysis to correct for differences in the probability of selection of the Part 2 respondents and to adjust for non-response (Kessler et al., 2005). Adjustments for the design effects were incorporated into the estimation process implemented by SAS (Version 9.1) survey procedures in order to generate accurate standard errors. Based on DSM-IV diagnoses and reports of trauma exposure, three mutually exclusive groups were constructed which included those with PTSD, those who experienced a trauma but did not meet criteria for PTSD and a non-traumatized comparison group. We excluded participants whose qualifying trauma for the PTSD assessment was diagnosis with a life-threatening illness (e.g. cardiovascular disease, stroke, cancer) in order to avoid inflation of the association between trauma/PTSD and chronic medical conditions (n=326). A series of logistic regression analyses were examined to estimate the multivariate relationships between PTSD/trauma exposure and chronic medical conditions. Each medical condition served as the outcome variable in separate logistic regression analyses. Gender, race, age, income, smoking status, insurance coverage and psychiatric comorbidity (i.e. lifetime diagnoses of MDD, substance-related disorders, and other anxiety disorders) were statistically controlled in each

model. Given the large number of regression analyses being performed for each of the 15 chronic medical conditions, the Bonferroni correction was used for interpreting overall tests and main effects, resulting in a significant p value of $.05/15 = .003$.

RESULTS

The analytic sample included 3108 (52.8 weighted %) females and 2258 (47.2 weighted %) males. Of the total sample, 738 (18.3 weighted %) respondents reported no qualifying trauma, 4054 (75.0 weighted %) respondents reported at least one qualifying trauma with no lifetime diagnosis of PTSD, and 574 (6.7 weighted %) respondents reported at least one qualifying trauma and had a lifetime diagnosis of PTSD. PTSD status was significantly related to all of the covariates except race (see Table I). More specifically, individuals with PTSD were more likely to be female, younger, report a lower annual income, lack health insurance, smoke, and have a history of major depression, other anxiety disorders, and substance abuse/dependence. Further, among traumatized individuals, those with PTSD reported more lifetime traumas and the index trauma was more likely to be primary (i.e. directly experienced).

Table II presents lifetime prevalence of individual chronic medical conditions by PTSD/trauma exposure. The omnibus χ^2 tests for the overall logistic regression models were significant for all 15 chronic medical conditions (all p s $<.0001$). Group assignment was associated with chronic pain conditions, heart disease, seasonal allergies, diabetes, ulcers, and cancer (p s $<.003$). For the chronic pain conditions, heart disease, and ulcers, lifetime prevalence was highest among those with PTSD, followed by the trauma and no trauma groups, respectively. The no trauma group had significantly lower rates of seasonal allergies, diabetes, and cancer than the trauma and PTSD groups, while rates of these conditions were found to be similar for the trauma and PTSD groups. Heart attack, high blood pressure, asthma, lung disease, stroke, and epilepsy, were unrelated to PTSD and/or trauma exposure.

Given that the majority of individuals reporting exposure to trauma endorsed more than one traumatic event (75.2%), additional logistic regression analyses were run restricting the sample to those experiencing trauma and adding to the model a variable reflecting the *number* of lifetime traumas endorsed. Additionally, we controlled for type of trauma (i.e. primary = directly experienced or secondary = witnessed) in order to adjust for the possibility that chronic medical conditions could be a result of the trauma itself; however, this covariate was not significantly related to any of the 15 chronic medical conditions. The omnibus χ^2 tests for the overall logistic regression models were significant for all 15 chronic medical conditions (all p 's $<.0001$). After controlling for number of lifetime traumas, PTSD status was only related to headaches (OR=1.6, 95% CI=1.2-2.0; $\chi^2=11.9$, $p=.0006$). However, higher number of lifetime traumas was a significant independent predictor of the majority of chronic medical conditions with high blood pressure and epilepsy being the exceptions (see Table III).

DISCUSSION

The present study used data from the NCS-R to examine the relationship between number of lifetime traumas, PTSD and fifteen self-reported chronic medical conditions. Two major findings emerged: 1) there was a graded relationship between trauma exposure, PTSD, and the majority of chronic medical conditions where individuals with PTSD had the highest likelihood of a chronic medical condition and non-traumatized individuals had the lowest risk; 2) with the exception of headaches, among those that reported exposure to trauma the relationship between PTSD and chronic medical conditions was no longer significant after controlling for the number of lifetime traumas experienced.

Our results suggested those with PTSD had the highest risk for arthritis/rheumatism, back/neck pain, headaches, chronic pain, heart disease, and ulcers with individuals without any trauma had the lowest rates of chronic medical conditions, and traumatized individuals without PTSD falling in between. Similar to prior research (Vedantham et al., 2001), these findings suggest that PTSD may impart a greater impact on health over and above trauma exposure. In contrast, there were no differences between the traumatized only and PTSD groups on several conditions including seasonal allergies, diabetes, and cancer. These findings are similar to Tate and colleagues (2007) where substance-dependent veterans with a history of other lifetime traumas had a greater risk of chronic health difficulties (i.e. back pain and diabetes) compared to substance-dependent veterans without a history of other trauma; however, PTSD status among the traumatized veterans did not impart a greater risk health. These findings suggest a graded relationship between trauma exposure and PTSD on some chronic medical conditions, which lends support to research suggesting that a greater burden to the system due to trauma and subsequent PTSD symptomatology (i.e. allostatic load) translates into poorer physical health (Schnurr & Green, 2004).

Since individuals with PTSD were more likely to have experienced a greater number of lifetime traumas, the sample was subset to traumatized individuals and additional analyses were conducted to examine the relationship between total number of lifetime traumas, PTSD, and chronic medical conditions. Notably, the prior relationship between PTSD and six chronic medical conditions was no longer significant when total lifetime trauma exposure was taken into account. Although the magnitude of the effect was small (ORs=1.1-1.2), there was a consistent graded relationship between number of lifetime traumas and 13 of the 15 chronic medical conditions. These findings further support prior research suggesting that multiple traumas has a cumulative effect on physical health (Dong et al., 2003; Felitti et al., 1998; Schnurr et al., 1998) and that the impact of trauma on health may be independent of PTSD symptomatology (Cloitre et al., 2001). Future research is needed to identify characteristics of traumatic experiences (e.g. type, duration, and severity of trauma exposure: Schilling, Aseltine, & Gore, 2008) that may influence the strength of the relationship between cumulative trauma and medical conditions.

Similar to prior research (Cloitre et al., 2001; Norman, 2006), our findings suggested that differences between the PTSD and trauma only groups varied across medical conditions. PTSD was consistently related to the chronic pain conditions (e.g. arthritis, back/neck pain, headaches, chronic pain), until analyses were adjusted for lifetime trauma exposure. Further, the relationship between PTSD and headaches remained even after controlling for the number of lifetime traumas. Comorbidity between mood disorders, anxiety disorders, and headaches is well known; however, little research has focused on the relationship between PTSD symptomatology and headaches (Baskin, Lipchik, & Smitherman, 2006; Griffith & Razavi, 2006).

The current findings should be interpreted within the context of study limitations. Assessment of chronic medical conditions relied on self-report rather than official medical records; however, research has demonstrated high concordance rates between self-reported medical conditions and medical records and agreement is especially high for stroke (Horner, Cohen, & Blazer, 2001; Okura, Urban, Mahoney, Jacobsen, & Rodeheffer, 2004; Simpson, Boyd, Carlson, Griswold, Guralnik, & Fried, 2004), heart attack (Okura et al., 2004), cancer (Simpson et al., 2004), and diabetes (Kehoe, Wu, Leske, & Chylack, 1994; Kriegsman, Penninx, van Eijk, Boeke, & Deeg, 1996; Simpson et al., 2004). Given that NCS-R respondents were limited to persons living in non-institutionalized households, it is expected that the sample represents the healthiest in terms of their chronic medical conditions, thus it is unclear how these findings would compare to research within health care settings. Also, in that the present study addressed the presence of lifetime psychiatric disorders and chronic medical conditions; medical

conditions may have predated or postdated PTSD diagnoses. While our exploratory analyses (not reported here) revealed that chronic pain conditions tended to onset after reports of a respondent's first trauma, due to possible biases in retrospective reporting, no clear conclusion could be drawn about either temporal ordering or causality. Similarly, due to the cross-sectional nature of the data, mediational analyses assessing whether PTSD symptomatology was a causal mechanism through which trauma impacted physical health, could not be conducted (Frazier, Tix, & Barron, 2004; MacKinnon, Krull, & Lockwood, 2000).

Despite limitations, to our knowledge, this is the first study using a nationally representative sample to consider the number of lifetime traumas when examining the association between PTSD and a range of chronic medical conditions. Notably, PTSD seemed to confer the greatest risk to physical health; however, when number of traumas was considered, this relationship was limited to headaches. It is possible that the relationship between PTSD and chronic medical conditions could be confounded by injuries stemming from the traumatic event (e.g. traumatic brain injury)(Sareen et al., 2005) and/or the qualifying trauma being diagnosis with a life-threatening illness. A major strength of the present study was that we excluded respondents whose qualifying trauma for the PTSD assessment was diagnosis with a life-threatening illness (e.g. cardiovascular disease, stroke, cancer) and controlled for trauma type (e.g. primary vs. secondary). Further, the relationship between trauma exposure and chronic medical conditions remained after controlling for other psychiatric comorbidities. Although the focus of this paper was on PTSD, a host of other psychiatric outcomes (i.e. depression, other anxiety disorders, substance abuse) tend to co-occur with PTSD symptomatology following trauma exposure (Brady, Killeen, Brewerton, & Lucerini, 2000; Breslau, Davis, Peterson, & Schultz, 2000; Brown, Fulton, Wilkeson, & Petty, 2000; Creamer, McFarlane, & Burgess, 2005; O'Donnell, Creamer, & Pattison, 2004). Similar to PTSD, depression (Evans, Charney, Lewis, Golden, Gorman, Krishnan et al., 2005), other anxiety disorders (Sareen et al., 2005; Scott, Bruffaerts, Tsang, Ormel, Alonso, Angermeyer et al., 2007), and substance-related disorders (Dickey, Normand, Weiss, Drake, & Azeni, 2002) have been independently associated with chronic medical conditions. Trauma exposure may play a role in previously found relationships between other psychiatric diagnoses (i.e. depression and substance-related disorders) poor physical health as well. On a related note, due to the high comorbidity between PTSD and other psychiatric diagnoses it is possible that conservatively controlling for these comorbidities may have diminished the PTSD-chronic medical condition relationship. However, exploratory analyses without comorbid diagnoses included as covariates did not change the overall findings suggesting that the lack of a relationship between PTSD and chronic medical conditions was not driven by issues of multicollinearity with other psychiatric disorders.

Taken together, these findings suggest that the often found relationship between PTSD and chronic medical conditions may reflect the cumulative burden of lifetime trauma in general and not something specific or unique to PTSD symptomatology. At the same time, a diagnosis of PTSD is much more common among individuals who have experienced multiple traumas making it difficult to disentangle the unique variability attributable to cumulative trauma exposure versus that attributable to PTSD symptomatology in association to chronic medical conditions. It has been suggested that a PTSD diagnosis may be best viewed as an extreme response to traumatic stress (Ruscio, Ruscio, & Keane, 2002), and that cumulative trauma exposure is sufficient to increase allostatic load to the point of physical illness without reaching the level of PTSD (Norman, 2006). These findings highlight the need to adequately assess lifetime trauma exposure as well as integrate models of care between mental health and physical health professionals (Schnurr & Green, 2004). Clearly, understanding the mechanisms underlying the connection between trauma, PTSD and chronic medical conditions is essential in order to build an effective model of treatment for both psychological and physical symptoms, and ultimately lessen the economic burden associated with these comorbidities.

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Table 1

The relationship between PTSD and sociodemographic variables and other psychiatric diagnoses

	No Trauma n=738	Trauma n=4054	PTSD n=574	Test Statistic
Gender				85.9, <.0001*
Female	59.1	49.3	75.0	
Male	40.9	50.7	25.0	
Race				15.9, .014
White	66.8	73.4	72.9	
African-American	12.8	12.4	13.0	
Hispanic	16.8	10.2	9.9	
Other	3.6	4.0	4.2	
Age	42.7 (1.1)	45.2 (0.5)	41.8 (0.8)	12.9, .0003*
Income	58,067(2,783.7)	60,533 (1,886.6)	51,375 (2,410.0)	12.3, .0005*
Insurance coverage (no)	19.7	17.6	29.6	18.9, <.0001*
Smoking (yes)	39.0	50.8	64.4	40.1, <.0001*
Major Depression Disorder (yes)	8.7	16.1	44.5	205.9, <.0001*
Other Anxiety Disorder (yes)	8.9	15.8	49.7	302.4, <.0001*
Substance abuse/dependence (yes)	5.1	15.6	32.7	190.5, <.0001*
Type of index trauma ^a				97.4, <.0001*
Primary	--	53.0	80.5	
Secondary	--	47.0	19.5	
Total number of traumas ^a	--	3.3 (0.1)	5.7 (0.2)	321.7, <.0001*

Note: Weighted % and Chi-square statistics are reported for categorical variables and mean (standard errors) and F statistics are reported for continuous variables.

^aIncluded as a covariate in analyses among traumatized individuals only

* significant at Bonferroni corrected $p < .005$

Table II
Multiple Logistic Regression Analyses of Group Status Predicting the Presence of a Chronic Medical Condition

	No trauma		Trauma		PTSD		Trauma vs. No Trauma		PTSD vs. No Trauma		PTSD vs. Trauma		Wald χ^2 , p
	%	AOR	%	AOR	%	AOR	AOR	95%CI	AOR	95%CI	AOR	95%CI	
Chronic pain conditions													
Arthritis/Rheumatism	16.9		28.3		38.1		1.9	(1.5-2.5)*	2.8	(1.9-4.1)*	1.5	(1.2-1.8)*	28.7, .0001*
Back/Neck Pain	17.2		30.2		49.4		1.8	(1.4-2.3)*	3.0	(2.1-4.2)*	1.7	(1.4-2.0)*	40.9, .0001*
Headaches	14.8		22.1		50.3		1.6	(1.1-2.3) ⁺	3.2	(2.1-4.9)*	2.0	(1.6-2.6)*	41.5, .0001*
Chronic Pain	1.8		10.1		22.1		5.4	(3.6-7.9)*	10.1	(6.6-15.5)*	1.9	(1.5-2.4)*	113.8, .0001*
Cardiovascular conditions													
Heart Attack	1.5		3.6		2.7		1.7	(0.6-5.0)	1.5	(0.5-4.9)	0.9	(0.4-1.7)	1.2, 0.56
Heart Disease	1.3		4.9		7.5		3.1	(1.3-7.1)*	6.3	(2.3-17.2)*	2.1	(1.5-2.9)*	18.8, .0001*
High Blood Pressure	16.7		24.6		26.7		1.5	(1.0-2.3)	2.0	(1.3-3.2)	1.3	(1.1-1.7)	10.3, .006 ⁺
Respiratory conditions													
Seasonal Allergies	27.6		39.0		45.2		1.7	(1.3-2.2)*	1.2	(1.1-1.4)*	1.1	(0.9-1.3)	24.7, .0001*
Asthma	88.1		11.9		14.1		1.5	(1.0-2.2)	1.4	(0.9-2.0)	0.9	(0.7-1.2)	4.2, 0.12
Lung Disease	0.5		2.2		4.6		3.8	(1.0-15.1)	6.0	(1.3-27.3)	1.6	(0.8-3.0)	5.6, 0.06
Neurologic conditions													
Stroke	2.0		2.6		3.7		1.0	(0.6-1.9)	2.0	(0.9-4.6)	1.9	(1.0-3.6)	4.2, 0.12
Epilepsy	0.8		1.8		4.4		2.0	(0.7-6.0)	3.8	(1.1-13.8) ⁺	1.9	(1.2-3.0) ⁺	7.2, 0.03 ⁺
Other conditions													
Diabetes	3.1		7.7		7.8		2.6	(1.7-4.1)*	3.1	(1.8-5.3)*	1.2	(0.8-1.7)	19.2, .0001*

	No trauma		Trauma		PTSD		Trauma vs. No Trauma		PTSD vs. No Trauma		PTSD vs. Trauma	
	%		%		%		AOR	95% CI	AOR	95% CI	AOR	95% CI
Ulcer	4.2		9.5	17.5	1.9	(1.2-3.0) ⁺	2.8	(1.7-4.5) [*]	1.5	(1.1-1.9) [*]	21.2	.0001 [*]
Cancer	1.7		6.4	7.3	3.5	(1.7-7.3) [*]	4.8	(2.1-10.9) [*]	1.4	(0.9-2.0)	14.0	.0009 [*]

Note: All models are adjusted for gender, race, age, income, insurance coverage, smoking status, and lifetime diagnoses of MDD, other anxiety disorders, and substance related disorders; % = weighted % of group with the medical condition, AOR =adjusted odds ratio, CI = confidence interval, Wald χ^2 =for the group main effect.

* significant at Bonferoni corrected p<.003

+ marginally significant at p<.05

Table III
Multiple Logistic Regression Analyses of Number of Lifetime Traumas Predicting the Presence of a Chronic Medical Condition among Traumatized Individuals

	No Mean (SE)	Yes Mean (SE)	AOR	95% CI	Wald χ^2 , p
Chronic pain conditions					
Arthritis/Rheumatism	3.3 (0.1)	4.1 (0.1)	1.1	1.1-1.2	64.4, .0001*
Back/Neck Pain	3.1 (0.1)	4.3 (0.1)	1.1*	1.1-1.2	78.4, .0001*
Headaches	3.2 (0.1)	4.4 (0.1)	1.1	1.1-1.2	63.3, .0001*
Chronic Pain	3.3 (0.1)	4.9 (0.2)	1.2	1.1-1.2	55.2, .0001*
Cardiovascular conditions					
Heart Attack	3.4 (0.1)	5.2 (0.5)	1.2	1.1-1.3	21.6, .0001*
Heart Disease	3.4 (0.1)	5.2 (0.3)	1.2	1.1-1.3	38.5, .0001*
High Blood Pressure	3.4 (0.1)	3.8 (0.1)	1.1	1.01-1.1	7.8, .005 ⁺
Respiratory conditions					
Seasonal Allergies	3.3 (0.1)	3.8 (0.1)	1.1	1.05-1.12	19.7, .0001*
Asthma	3.4 (0.1)	4.1 (0.2)	1.1	1.05-1.13	17.6, .0001*
Lung Disease	3.4 (0.1)	5.4 (0.3)	1.2	1.1-1.2	36.6, .0001*
Neurologic conditions					
Stroke	3.5 (0.1)	4.9 (0.4)	1.2	1.1-1.3	20.1, .0001*
Epilepsy	3.5 (0.1)	4.2 (0.4)	1.0	0.97-1.1	1.5, 0.22
Other conditions					
Diabetes	3.4 (0.1)	4.1 (0.2)	1.1	1.1-1.2	30.2, .0001*

	No Mean (SE)	Yes Mean (SE)	AOR	95% CI	Wald χ^2 , p
Ulcer	3.4 (0.1)	4.8 (0.2)	1.1	1.1-1.2	44.3, .0001*
Cancer	3.4 (0.1)	4.5 (0.2)	1.2	1.1-1.3	39.1, .0001*

Note: All models are adjusted for gender, race, age, income, insurance coverage, smoking status, and lifetime diagnoses of MDD, other anxiety disorders, and substance related disorders; No = medical condition not present, Yes = medical condition present, Mean = mean number of lifetime traumas, SE=standard error, AOR =adjusted odds ratio, CI = confidence interval, Wald χ^2 =for the number of traumas main effect.

* significant at Bonferroni corrected $p < .003$

+ marginally significant at $p < .05$