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The relationships between posttraumatic stress disorder severity, depression severity and physical health

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Abstract

This study examines the relationship among posttraumatic stress disorder (PTSD) severity, depression severity, and subjective and objective physical health in a sample of 200 adults with PTSD. PTSD severity was correlated with subjective, but not objective, health. Similarly, depression symptoms had an indirect effect on the relationship between PTSD symptom severity and three measures of subjective physical health. Finally, depression symptoms had an indirect effect on the relationship between both reexperiencing and hyperarousal symptoms and subjective physical health. This research underscores the important role that PTSD, particularly reexperiencing and hyperarousal symptoms, and depression may have on perceptions of physical health.

Keywords

Adults; depression; correlation; physical symptoms; health psychology

Introduction

Although the hallmark symptoms of posttraumatic stress disorder (PTSD) (i.e., reexperiencing, avoidance, and hyperarousal; American Psychiatric Association [APA], 2000) are psychological in nature, PTSD is also associated with significant physical suffering (e.g., Stein et al., 2005; Tanielian and Jaycox, 2008). Specifically, PTSD is consistently related to self-reported bodily pain, impaired functioning, poor general health, and physical role limitations (e.g., Butterfield, Forneris, Feldman and Beckham, 2000; Ciechanowski, Walker, Russo, Newman and Katon, 2004; Dobie et al., 2004; Gillock, Zayfert, Hegel and Ferguson, 2005). These physical complaints result in both undue suffering and significant medical costs (e.g., Greenberg et al., 1999; Walker et al., 2003). Unfortunately, given the rising cost of health care (Keehan et al., 2011), the severity of this problem is only expected to grow.

Even though it is clear that the physical health consequences associated with PTSD have a negative impact on individuals and society at large (e.g., Tanielian and Jaycox, 2008; Walker et al., 2003), there is a relative paucity of information about how PTSD affects physical health (e.g., Boscarino, 2004). As described above, PTSD is clearly associated with

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decreased *subjective* health (i.e., self-reported, perceptions of health status, and physical functioning); however, it is unclear whether PTSD is also associated with decreased *objective* physical health (e.g., measures of cardiovascular functioning, obesity, and other medical conditions). For example, PTSD has been associated with a higher number of medical conditions in several, but not all, studies (e.g., Qureshi, Pyne, Magruder, Schulz and Kunik, 2009). Likewise, the relationship between PTSD and cardiovascular functioning (e.g., Buckley and Kaloupek, 2001; Dedert, Calhoun, Watkins, Sherwood and Beckham, 2010) and obesity (e.g., Perkonig, Owashi, Stein, Kirschbaum and Wittchen, 2009; Pagoto et al., 2012) remains equivocal. Thus, although PTSD is consistently associated with perceptions of negative health, it is less clear whether PTSD is associated with biological changes related to poor health and disease.

Research examining the relationship among PTSD and both subjective and objective physical health is important because these two forms of measurement frequently do not significantly correlate with one another. For example, objective injury severity (based on chart review) does not strongly correlate with subjective injury severity (based on self-report) for trauma injury victims (Gabert-Quillen, Fallon, and Delahanty, 2011). Similarly, in combat veterans, the association between self-reported health problems and physician-rated health problems is small to moderate in size (Beckham et al., 1998). Thus, research examining both subjective and objective health complaints among individuals with PTSD is important because each of these forms of measurement could provide unique information about how PTSD is related to physical health.

In addition to the relationship between PTSD severity and physical health, the relationship between specific PTSD symptom clusters (i.e., avoidance, hyperarousal, and reexperiencing) and physical health is uncertain. In fact, hyperarousal (Kimerling, Clum and Wolfe, 2000), reexperiencing (Beckham et al., 1997; Zoellner, Goodwin and Foa, 2000), and avoidance (Polusny et al., 2008) symptoms have each been associated with negative perceptions of health. However, all of the aforementioned studies used the DSM-IV symptom clusters, which are rationally derived and not supported by empirical research (e.g., Simms, Watson and Doebbeling, 2002; Yufik and Simms, 2010). Thus, research using empirically-supported factors (e.g., Simms et al., 2002; Yufik and Simms, 2010) could aid in our understanding of which PTSD symptoms contribute to objective and subjective physical health outcomes. In addition to uncertainty surrounding the nature of the physical health changes associated with PTSD and the specific PTSD symptoms associated with negative physical health outcomes, our understanding of the pathways between PTSD and physical health is also limited (e.g., Boscarino, 2004). One factor that may play an important role in the relationship between PTSD and negative physical health outcomes is depression. PTSD frequently co-occurs with major depressive disorder (MDD; e.g., Kessler, Chiu, Demler and Walters, 2005), and for the majority of individuals, PTSD precedes the development of MDD (Kessler, Sonnega, Bromet, Hughes and Nelson, 1995). Furthermore, depression is consistently associated with greater bodily pain, poorer general health, impaired functioning, and physical role limitations (e.g., ten Doesschate et al., 2010; Williams, Kerber, Mulrow, Medina and Aguilar, 1995) when compared to non-depressed samples. With regard to objective health measures, the results are mixed. MDD is related to a variety of health problems and diseases (e.g., Evans et al., 2005; Liew, 2012). However, there are mixed findings regarding the relationship between MDD and physiological functioning (e.g., heart rate [e.g., Agelink, Boz, Ullrich and Andrich, 2002; Guinjoan, Bernabó and Cardinali, 1995], blood pressure [e.g., Hildrum, Mykletun, Holmen and Dahl, 2008; Jonas, Franks and Ingram, 1997]) and obesity (e.g., McElroy et al., 2004; Simon et al., 2006).

Given the high rate of comorbidity between PTSD and MDD, the tendency for PTSD to precede the onset of MDD, and MDD's association with physical health, it has been

hypothesized that depression has an indirect effect on the relationship between PTSD and physical health. Depression has been shown to mediate the relationships between PTSD and physical complaints (Miranda, Meyerson, Marx and Tucker, 2002), pain (Poundja, Fikretoglu and Brunet, 2006), and both perceived negative health and self-reported medical conditions (Asmundson, Stein and McCreary, 2002). However, to date, no studies have examined whether depression has an indirect effect on the relationship between PTSD and cardiovascular functioning or obesity.

Thus, the aim of the current study was to gain a better understanding of the relationships among PTSD severity, depression severity, and both subjective and objective health by examining: (a) whether PTSD severity is related to decreased objective physical health (i.e., medical conditions, blood pressure, heart rate, or body mass index [BMI]) and/or subjective physical health (i.e., physical functioning, physical role limitations, general health, and bodily pain) and (b) whether depression symptom severity has an indirect effect on the relationship between PTSD severity and a range of subjective and objective health measures. It was hypothesized that PTSD would be more consistently associated with subjective than objective measures of physical health. Furthermore, we hypothesized that depression symptoms would have an indirect effect on the relationship between PTSD severity and subjective health.

A secondary goal of this study was to gain a more nuanced understanding of the relationship between PTSD severity, depression symptoms, and physical health by examining the relationship of each of Simms et al.'s (2002) empirically-supported PTSD symptom clusters (i.e., reexperiencing, avoidance, hyperarousal) with depression symptoms and physical health. Given that our subjective outcome measures (i.e., self-reported physical functioning, general health, bodily pain, and physical role limitations) were most similar to the outcome measures assessed by Zoellner et al. (2000; self-reported physical symptoms) and Beckham et al. (1997; pain), who found that reexperiencing symptoms were most related to subjective physical health, it was tentatively hypothesized that reexperiencing symptoms would be correlated with subjective health and that depression severity would have an indirect effect on this relationship.

Method

Participants

Two hundred participants with PTSD were recruited via community referrals and advertisements for a treatment study examining the relative efficacy of two treatments for PTSD: prolonged exposure (PE) and sertraline. Inclusion criteria included a primary current DSM-IV diagnosis of chronic PTSD and age in the range of 18–65 years. Exclusion criteria were current diagnosis of schizophrenia or delusional disorder; medically unstable bipolar disorder; depression with psychotic features or psychopathology that was severe enough to require immediate psychiatric treatment; severe self-injurious behavior or suicide attempt within three months, no clear trauma memory or trauma before age of three; alcohol or substance dependence within three months prior to assessment; or an ongoing intimate relationship with the perpetrator (in assault cases); unwilling or medically not advisable to stop current cognitive behavioral psychotherapy or antidepressant medication, based on condition assignment; previous non-response to adequate trial of either PE (8 sessions or more) or sertraline (150 mg/d; 8 weeks); or medical contraindication for the initiation of sertraline (e.g., pregnancy/likely to become pregnant).

The mean age of the participants was 37.41 ($SD = 11.30$) years, and 75.5% of the sample were women. Furthermore, 65.5% of the participants were Caucasian, 21.5% were African

American, and 13.0% were from other backgrounds. On average, it had been 11.97 ($SD = 12.69$) years since they had experienced the trauma associated with their PTSD diagnosis.

Measures

PTSD Symptom Scale-Interview—Current PTSD diagnosis and severity was assessed using the PTSD Symptom Scale-Interview (PSS-I; Foa, Riggs, Dancu and Rothbaum, 1993), a 17-item interview that uses DSM-IV symptom criteria. Each item is rated from 0 to 3, with higher levels indicating greater PTSD severity. PTSD diagnosis was attained if at least one reexperiencing, three avoidance, and two arousal items were endorsed. Severity of reexperiencing, avoidance, hyperarousal, and dysphoria factors were calculated based on Simms et al.'s (2002) factor analysis. The PSS-I demonstrates good validity and reliability and interrater reliability for PTSD (Foa et al., 1993; Foa and Tolin, 2000). In the present study, over 10% of cases were rerated for interrater reliability. Reliability based on consistency was high for PTSD severity scores ($ICC = .95$) and PTSD diagnosis ($\kappa = 1.00$).

Hamilton Rating Scale for Depression – 24 Items—($HRSD_{24}$; Hamilton, 1960) is an interviewer-rated interview consisting of 24 items measuring the severity of depression symptoms in the past week. Items are scored from either 0 to 2 or 0 to 4, with higher scores indicating greater severity. The HRSD has excellent interrater reliability ($r = .90$), good internal consistency ($\alpha = .76$; Rehm and O'Hara, 1985), and adequate convergent validity with a range of depression measures (Bagby, Ryder, Schuller and Marshall, 2004). In the present study, reliability for $HRSD_{24}$ overall severity scores was good ($ICC = .89$) based on the 10% of cases that were rerated for reliability.

The Medical Outcomes Study: 36-Item Short Form Survey—Current health status was assessed using The Medical Outcomes Study Short Form 36 (SF-36; Ware and Sherbourne, 1992). The SF-36 is a self-report measure that assesses eight mental and physical health domains. In the current study, only the physical health subscales were examined (i.e., physical functioning, role limitations due to physical health problems [physical role limitations], bodily pain, and general physical health). For each domain, scores range from 0 to 100, with 100 representing optimal health and functioning. In the current sample, the internal consistency of each subscale was good (general health, $\alpha = .79$; bodily pain, $\alpha = .90$; physical role limitations, $\alpha = .91$; and physical functioning, $\alpha = .92$) and similar to previous research findings (McHorney, Ware, Lu and Sherbourne, 1994).

Physical examination—A physical examination was performed by a nurse or nurse practitioner. Resting systolic and diastolic blood pressure and resting heart rate, were obtained using an automatic blood pressure cuff that was accurate to ± 3 mmHG for blood pressure and $\pm 5\%$ for pulse rate. Height and weight were measured using a Health-o-meter Professional Beam Scale (with ± 0.1 kg accuracy) and used to calculate BMI. Self-reported current medical conditions were verbally obtained by the interviewer and categorized as follows: cardiovascular, gastrointestinal/hematological/liver, pulmonary, gynecological, dermatological, neurological, pain, musculoskeletal, endocrine, and other. Each category was coded as a binary variable (0 = absent, 1 = present), and the total number of categories endorsed was used for analyses.

Procedure

Following a phone screen, potentially eligible participants were scheduled for an intake assessment to determine eligibility for the treatment study. After informed consent, trained independent evaluators conducted diagnostic interviews. Eligible participants then completed self-report measures and a physical examination. All of the participant responses to the self-report questionnaires were given in private on a computer, not to a research staff

member. The physical examination was completed in a private office by either a nurse or nurse practitioner.

Results

Sample characteristics

Means, standard deviations, and ranges for each of the measures are listed in Table 1. PTSD scores ranged from moderate to severe. Depression symptoms (HRSD₂₄ scores) ranged from mild to severe with mean scores in the moderate range. In terms of health measures, scores ranged from very poor physical health to optimal physical health.

Is PTSD severity associated with subjective and objective physical health outcomes?

To examine the relationships between PTSD severity and physical health, the zero order correlations between PTSD symptoms (PSS-I scores) and health outcomes were examined. As shown in Table 1, consistent with the hypothesis that PTSD severity would be related to subjective physical health, there was a significant, but small, correlation between PSS-I scores and all four measures of subjective physical health ($ps < .05$), such that greater PTSD symptoms were related to worse subjective physical health. Furthermore, greater reexperiencing and hyperarousal symptoms were associated with greater pain and reduced physical functioning. PTSD severity and the PTSD symptom clusters were not significantly associated with any objective physical health measures.

Does depression have an indirect effect on the relationship between PTSD and physical health?

To test the hypothesis that depression symptom severity (HRSD₂₄) would have an indirect effect on the relationship between PTSD symptom severity (PSS-I) and subjective physical health, we examined indirect effects using a non-parametric bootstrapping approach (Preacher and Hayes, 2004; 2008). We used the SPSS mediation macro created by Hayes and Preacher (2011) to conduct these analyses. For each analysis, this macro took 5,000 random samples of the obtained data, replacing each value as it was sampled. The cross product of the relationship between the independent variable (i.e., PTSD severity) and the intervening variable (i.e., depression severity) and the relationship between the intervening variable (i.e., PTSD severity) and the dependent variable (i.e., subjective or objective health) was calculated for each sample. The point estimate of the indirect effect is the mean cross product computed over the samples. Confidence intervals were derived from the obtained distribution of the cross products over the samples (with Z-score based corrections for bias). Therefore, a 95% confidence interval consists of the bias corrected 2.5 and 97.5 percentile scores of the distribution of obtained cross products in the bootstrapped samples. When the upper and lower bounds of these bias corrected confidence intervals do not contain zero, the indirect effect is statistically significant at $p < .05$.

As shown in Table 2, the bias corrected 95% confidence interval surrounding the point estimate did not contain zero for three of the four measures of subjective health (general health, physical functioning, and bodily pain). Thus, depression symptom had an indirect effect on the relationship between these three measures of subjective health, but none of the measures of objective physical health.

Does depression have an indirect effect on the relationship between PTSD subscales and physical health?

The final hypothesis predicted that depression would have an indirect effect on the relationship between the PTSD reexperiencing symptoms and subjective physical health. To

test this hypothesis we again used Hayes and Preacher's (2011) mediation macro. Simms' et al.'s (2002) PSSI reexperiencing scores, avoidance scores, and hyperarousal scores were entered as the independent variables, HRSD₂₄ scores were entered as the intervening variable and the health outcome measures were entered as the dependent variable. As can be seen in Table 3, depression severity had an indirect effect on the relationship between reexperiencing and all four subjective physical health measures. In addition, depression had an indirect effect on the relationship between hyperarousal and all subjective health measures. There was no strong evidence that depression severity had an indirect effect on the relationship between avoidance symptoms and subjective health outcomes or any of Simms' PTSD factors and objective health outcomes.

Discussion

Results of this study provide further evidence that, as we try to understand the relationship between PTSD and health, clients' *subjective perceptions* of health matter. Although previous studies examining subjective health outcomes (e.g., Butterfield et al., 2000; Ciechanowski et al., 2004; Dobie et al., 2004; Gillock et al., 2005) more consistently link PTSD to negative physical health than studies examining PTSD and objective health (e.g., Buckley and Kaloupek, 2001; Dedert et al., 2010; Qureshi et al., 2009), research directly comparing subjective and objective physical health outcomes among individuals with PTSD is lacking. In keeping with previous research, PTSD symptoms in the current study were related to subjective physical health (as measured by self-reported physical functioning, physical role limitations, bodily pain, and general health) but not objective physical health (as measured by number of medical conditions, blood pressure, and BMI), suggesting that PTSD severity is more strongly associated with negative perceptions of health than objective physical health outcomes. Interestingly, this finding fits with research showing that subjective perceptions of injury severity following a trauma were more strongly associated with the development of PTSD than objective measures of injury severity (Gabert-Quillen, Fallon, and Delahanty, 2011). Thus, subjective perceptions of physical health appear to be an important consideration both prior to and following the onset of PTSD.

Our results also highlight the central role depression plays in the relationship between PTSD and subjective perceptions of health. Consistent with previous research (Asmundson et al., 2002; Miranda et al., 2002; Poundja et al., 2006), depression had an indirect effect on the relationship between PTSD and three of four measures of subjective physical health. However, there was no strong evidence of this relationship for the objective health measures. The association between PTSD, depression, and subjective health makes sense in that PTSD tends to precede depression (Kessler et al., 1995), and depression is associated with symptoms like fatigue and loss of interest (APA, 2000). These symptoms of depression may exacerbate preexisting physical limitations and/or cause perceptions of limited physical abilities. Furthermore, depression is clearly linked to increased pain perception (e.g., Bair, Robinson, Katon and Kroenke, 2003) and somatic complaints (e.g., Garcia-Campayo et al., 2008), which can contribute to perceptions of poor health.

With respect to objective physical health, although the research is mixed, in contrast to the current study, some studies have found a relationship between PTSD and medical conditions (Qureshi et al., 2009), impaired cardiovascular functioning (Buckley and Kaloupek, 2001), and obesity (e.g., Pagoto et al., 2012). Unfortunately, due to the limited extant research on this topic, it is difficult to draw conclusions regarding the factors that may account for these inconsistent findings. Thus, as encouraged by Dedert et al. (2010), "epidemiologic studies of PTSD and physical illness must continue to establish that results are consistent across demographic groups, such as age, race, gender, veteran status, socioeconomic status and marital status" (pp. 70–71).

In “unpacking” the relationships among PTSD, depression, and health, we also examined the relationship between Simms et al.’s (2002) empirically validated symptom factors, depression severity, and physical health. Hyperarousal and reexperiencing symptoms were associated with physical functioning and bodily pain. Furthermore, depression severity had an indirect effect on the relationship between reexperiencing and hyperarousal symptoms and subjective health. Interestingly, avoidance was not significantly associated with subjective physical health. Hypothetically, the physical sensations associated with reexperiencing and hyperarousal (e.g., sweating, shaking, heart racing, muscle tension) may be interpreted as pathological and excessively impairing and thus increase symptoms of depression and perceptions of negative health (Cohen and Williamson; 1991; Zoellner et al., 2000). Avoidance, on the other hand, does not tend to be associated with these physical symptoms, which may explain why it was not significantly related to negative health outcomes. If future research is consistent with this hypothesis, education about the nature of physical symptoms associated with PTSD may help reduce perceived physical symptoms in individuals with PTSD.

In interpreting these results, several limitations should be kept in mind. First, this study was cross-sectional in nature. Second, all participants in this study were diagnosed with chronic PTSD. Thus, we can make statements about how the severity of PTSD is related to physical health, but we are unable to comment on whether the presence or absence of PTSD is associated with physical health outcomes. Third, although PTSD was not strongly associated with objective health measures in the current study, different measures of objective health (e.g., heart rate or blood pressure in response to a stressor, cortisol levels, etc.) might provide evidence of a relationship between PTSD and objective health measures. Additionally, it is important to remember that the relationship between PTSD and physical health is complex. Therefore, future research examining additional mediators and moderators of the relationship between PTSD symptoms and health outcomes is needed.

In summary, this study is one of the first to examine the relationship between PTSD severity, depression, and both objective and subjective health outcomes. In keeping with previous research, depression had an indirect effect on the relationship between PTSD and negative subjective health, but not objective health. Additionally, the current study extended the existing literature by demonstrating that reexperiencing and hyperarousal symptoms, rather than avoidance symptoms, may play an important role in this relationship. Thus, when individuals present with physical health complaints of unknown origin or physical symptoms that are out of proportion relative to existing medical conditions, screening, psychoeducation, and treatment for PTSD and depression could lead to improvements in perceptions of health, reductions in unnecessary medical tests and treatments, and significant financial savings.

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Table 1
Means, Standard Deviations, and Correlations for PTSD, Depression, and Health Measures.

Measure	M	SD	Range	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. PSS-I	29.57	6.69	15–46	-														
2. PSSI-Reexperiencing	7.54	2.78	2–15	.69**	-													
3. PSSI-Avoidance	4.58	1.34	0–6	.57**	.39**	-												
4. PSSI-Hyperarousal	3.86	1.78	0–6	.47**	.21**	.13	-											
5. PSSI-Dysphoria	13.59	4.02	3–22	.79**	.23**	.29**	.15*	-										
6. HRSD ₂₄	23.71	10.29	3–59	.63**	.39**	.24**	.24**	.59**	-									
7. General Health	53.53	22.18	5–100	-.16*	-.05	-.03	-.02	-.21**	-.25**	-								
8. Physical Functioning	76.98	25.14	0–100	-.22**	-.19**	-.13	-.17*	-.11	-.28**	.45**	-							
9. Physical Role Limitations	55.47	44.24	0–100	-.18**	-.12	-.09	.12	-.14	-.22**	.51**	.52**	-						
10. Bodily Pain	62.30	25.63	0–100	-.23**	-.22**	-.10	-.16*	-.13	-.27**	.55**	.57**	.58**	-					
11. Systolic BP	118.78	16.22	80–199	.02	.05	.05	-.09	.02	.01	-.07	-.09	-.07	-.06	-				
12. Diastolic BP	77.58	10.95	50–120	.03	.12	.10	-.12	-.02	.07	-.08	-.14	-.16*	-.04	.68**	-			
13. Heart Rate	72.78	10.99	45–120	-.01	-.04	.05	-.06	.02	.03	-.10	-.09	.05	-.02	.28**	.22**	-		
14. BMI	28.67	7.51	17.30–63.70	.08	.06	.12	.05	.03	.04	-.11	-.15*	-.11	-.09	.37**	.37**	.11	-	
15. Medical conditions	.95	1.05	0–5	-.004	.06	.06	-.06	-.04	-.03	-.20**	-.29**	-.16*	-.33**	.11	.18*	.10	.01	-

Note.

** $p < .01$;

* $p < .05$.

Scores closer to 100 on the SF-36 (i.e., general health, physical functioning, physical role limitations, bodily pain) are related to more optimal physical health. Of the 200 individuals that participated in the study, 67.1% had at least one additional current DSM-IV axis I disorder. Fifty-three percent of the sample had currently co-occurring MDD. In total, 198 participants completed the subjective health measure (The Medical Outcomes Study: 36-Item Short Form Survey, Ware and Sherbourne, 1992), 185 had usable blood pressure measurements, and 189 completed measures of heart rate, BMI, and medical conditions. BP = Blood Pressure.

Regression Coefficients and Bootstrapped Point Estimates Examining the Indirect Effect of Depression Severity on the Relationship PTSD Severity and Physical Health.

Table 2

Dependent Variable	Path	Normal Theory Tests			Bootstrapping Results for Indirect Effects (95% CI)			
		B	SE	t	Point Estimate	SE	Lower	Upper
General Health	a	.96	.09	11.08**				
	b	-.53	.19	-2.76**				
	c	-.53	.23	-2.25**				
	c'	-.02	.30	-.08				
	a* b				-.51*	.20	-.91	-.11
Physical Functioning	a	.96	.09	11.08**				
	b	-.59	.21	-2.75**				
	c	-.82	.26	-3.13**				
	c'	-.26	.33	-.79				
	a* b				-.56*	.20	-1.00	-.19
Physical Role Limitations	a	.96	.09	11.08**				
	b	-.75	.38	-1.95*				
	c	-1.21	.47	-2.60*				
	c'	-.50	.59	-0.84				
	a* b				-.72	.40	-1.52	.06
Bodily Pain	a	.96	.09	11.08**				
	b	-.49	.22	2.25*				
	c	-.89	.27	-3.33*				
	c'	-.42	.34	-1.25				
	a* b				-.47*	.22	-.92	-.06
BMI	a	.98	.09	10.72**				
	b	-.01	.07	-.10				
	c	.09	.08	1.06				
	c'	.10	.11	.89				
	a* b				-.01	.06	-.13	.12

Dependent Variable	Normal Theory Tests				Bootstrapping Results for Indirect Effects (95% CI)			
	Path	B	SE	t	Point Estimate	SE	Lower	Upper
Heart Rate	a	.96	.09	10.60**				
	b	.06	.10	.59				
	c	-.02	.12	-.20				
	c'	-.08	.16	-.52				
	a*b				.06	.10	-.14	.25
Systolic BP	a	.97	.09	10.34**				
	b	-.01	.15	-.07				
	c	.06	.19	.30				
	c'	.07	.23	.28				
	a*b				-.01	.13	-.27	.25
Diastolic BP	a	.97	.09	10.34**				
	b	.09	.10	.90				
	c	.05	.13	.37				
	c'	-.04	.16	-.25				
	a*b				.09	.11	-.12	.33
Medical Conditions	a	.98	.09	10.72**				
	b	-.005	.01	-.50				
	c	-.001	.01	-.05				
	c'	.004	.02	.27				
	a*b				-.005	.01	-.02	.01

Note. 5,000 bootstrap samples; Path a is the relationship between PTSD severity and depression severity; path b is the relationship between depression severity and physical health (e.g., physical functioning); path c is the direct effect of PTSD severity on physical health; and c' is the effect of PTSD severity on physical health after controlling for depression severity. a*b = c - c'. Thus, when the a*b cross product is statistically significant, there is evidence of an indirect effect.

*
p < .05.

Bootstrapped Point Estimates Examining the Indirect Effect of Depression Severity on the Relationship Between PTSD Symptom Clusters and Physical Health.

Table 3

Dependent Variable	Independent Variables	Bootstrapping Results and 95% CI for Indirect Effects (a* b)			
		Point Estimate	SE	Lower	Upper
General Health	Reexperiencing	-.69*	.26	-1.26	-.21
	Avoidance	-.43	.37	-1.25	.16
	Hyperarousal	-.54*	.26	-1.09	-.08
Physical Functioning	Reexperiencing	-.64*	.25	-1.20	-.21
	Avoidance	-.39	.34	-1.07	.27
	Hyperarousal	-.50*	.25	-1.09	-.10
Role Limitations	Reexperiencing	-.94*	.46	-1.94	-.11
	Avoidance	-.58	.55	1.81	.32
	Hyperarousal	-.74*	.41	-1.73	-.02
Bodily Pain	Reexperiencing	-.57*	.26	-1.13	-.13
	Avoidance	-.35	.32	-1.10	.18
	Hyperarousal	-.45*	.23	-.92	-.04
BMI	Reexperiencing	.01	.07	-.14	.14
	Avoidance	.004	.05	-.10	.10
	Hyperarousal	.01	.05	-.10	.11
Heart rate	Reexperiencing	.07	.11	-.13	.31
	Avoidance	.03	.07	-.10	.20
	Hyperarousal	.05	.08	-.11	.23
Systolic BP	Reexperiencing	.002	.15	-.31	.28
	Avoidance	.001	.10	-.25	.20
	Hyperarousal	.002	.11	-.23	.21
Diastolic BP	Reexperiencing	.06	.11	-.17	.28
	Avoidance	.03	.08	-.12	.24
	Hyperarousal	.04	.08	-.12	.23
Medical Conditions	Reexperiencing	-.01	.01	-.03	.01

Bootstrapping Results and 95% CI for Indirect Effects (a* b)					
Dependent Variable	Independent Variables	Point Estimate	SE	Lower	Upper
	Avoidance	-.004	.01	-.02	.01
	Hyperarousal	-.005	.01	-.02	.01

Note. 5,000 bootstrap samples;

* $p<.05$.