

# The Effects of Torture-Related Injuries on Long-Term Psychological Distress in a Punjabi Sikh Sample

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Torture survivors often report chronic debilitating physical and psychological distress. Prior research on the relationship between physical and psychological trauma suggests that the 2 are not independent. Injury sustained during torture may increase the likelihood of subsequent distress as either a moderator or mediator. For long-term psychopathology in a sample of Punjabi Sikh survivors of human rights violations ( $N = 116$ ), chronic injuries mediated the path between torture and posttraumatic stress disorder, specifically the severity of numbing symptoms. Although injuries were associated with major depression, torture was not, and injuries did not moderate the relationship between major depression and torture. Chronic injuries may represent trauma severity or persistent traumatic cues. These findings emphasize connections between physical and psychological trauma and the importance of an interdisciplinary approach to torture treatment.

*Keywords:* PTSD, injury, torture, Sikhs, India

Torture is one of the most extreme forms of interpersonal violence; an assault on the mind as well as the body. Torture survivors are more likely than individuals exposed to other forms of violence to report symptoms of posttraumatic stress disorder (PTSD), major depression, and elevated anxiety, and these symptoms often have severe consequences for daily functioning long after the events that precipitated them (de Jong et al., 2001; Holtz, 1998; Jaranson et al., 2004; Mollica, 2004; Shrestha et al., 1998; Tang & Fox, 2001). Bosnian refugees, 18% of whom had been tortured, suffered high rates of PTSD, trauma-related depression, and anxiety 1 year following the cessation of hostilities in the former Yugoslavia (Mollica et al., 1999), and findings from 5 years after trauma exposure were not substantially different (Momartin, Silove, Manicavasagar, & Steel, 2004). Physical inju-

ries are also often reported following torture, with similarly debilitating long-term effects (Forrest, 1995). United States Navy prisoners of war tortured by the North Vietnamese were found to have higher rates of joint, back, and peripheral nervous system damage than comparison veterans over 15 years following their return (Nice, Garland, Hilton, Baggett, & Mitchell, 1997). Among a sample of Southeast Asian refugees living in the United States, one third were found to be suffering from a number of physical problems associated with incarceration and torture (Mollica, Wyshak, & Lavelle, 1987). What has yet to be established is the effect injuries sustained during torture have on survivors' psychological states.

Among nontortured samples, physical injuries sustained during potentially traumatic experiences are associated with a higher likelihood of PTSD (Blanchard et al., 1997; Kilpatrick et al., 1989; Winfield, George, Swartz, & Blazer, 1990). Among motor vehicle accident victims followed from their initial emergency room visits, rates of PTSD 1 month after the accident were higher for those with injuries than for those without injuries (Delahanty, Raimonde, Spoonster, & Cullado, 2003). Among veterans who had experienced the same set of combat experiences (i.e., without variability in trauma experiences), those injured had higher severity scores on the Clinician-Administered PTSD Scale (CAPS; Blake et al., 2004) and were more likely to develop PTSD than those reporting trauma exposure without injury (Koren, Norman, Cohen, Berman, & Klein, 2005). In general, injury seems to exacerbate the effect of the psychological trauma—in other words, it *moderates* the relationship between trauma and PTSD.

Torture survivors often report severe chronic pain and injury years after torture (Thomsen, Eriksen, & Smidt-Nielsen, 2000).

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Although we found no studies that documented an association between chronic pain or injury and PTSD among torture survivors, PTSD is more likely among individuals reporting chronic pain than among those not complaining of pain following other types of potentially traumatic events (Sharp & Harvey, 2001). Some have argued that chronic pain and PTSD may constitute “a cycle of mutual maintenance” (Sharp & Harvey, 2001, p. 871), in which PTSD symptoms and pain are reinforced by each other and by the responses of caretakers to the sufferer’s situation. Avoiding activities that might exacerbate injuries and a preoccupation with safety not only lead to physical deconditioning and codified disability but also reinforce psychological avoidance. Cognitive demand from physical symptoms reinforces maladaptive coping strategies for dealing with psychological distress. This suggests that those with chronic pain or lasting injury and PTSD would be less likely to improve than those without pain. Over time this would result in an increasing rate of injury among PTSD cases in a traumatized population, a situation in which injury *mediates*—rather than moderates—the effect of trauma on PTSD in the long term. The mechanism producing at least a good part of the effect of trauma on long-term PTSD would be chronic pain/injury.

Although not typically studied in the context of trauma, the association between chronic pain and major depression is well established (e.g., Ohayon & Schatzberg, 2003). Across a number of studies, depressive disorders are generally reported in about half of chronic pain patients (Banks & Kerns, 1996; Kouyanou, Pither, Rabe-Hesketh, & Wessley, 1998; Polatin, Kinney, Gatchel, Lillo, & Mayer, 1993). The high comorbidity of depression and pain may be due to the fact that many of the consequences of chronic pain—psychomotor retardation, sleep disturbance—are also symptoms of depression, but it seems equally as likely that the consequences of chronic pain negatively affect mood and cognitions. No research to date has examined the relationship between injuries or pain and depression in the context of traumatic events, other than the observation that depression is a common consequence of torture (e.g., Mollica, 2004). As with many *Diagnostic and Statistical Manual of Mental Disorders (DSM)* disorders and PTSD (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), PTSD and major depression have often been found to be comorbid within samples exposed to trauma. For example, Breslau and colleagues (Breslau, Davis, Peterson, & Schultz, 2000) found that individuals exposed to trauma who developed PTSD were 2.8 times more likely to develop major depression than exposed individuals who did not develop PTSD.

Whether injuries moderate or mediate the relationship between torture and psychopathology long after the torture event is not entirely clear. Prior research indicates a clear moderation effect, but given that most psychopathology remits for most individuals over time, the exacerbating effect of chronic injuries may make mediation more likely in the long term. The present study investigates whether physical injury moderates or mediates the relationship between torture and PTSD and major depression among survivors of political persecution in India. From 1984 to 1995, widespread civil unrest and bloodshed occurred in the north Indian state of Punjab (Amnesty International, 2003; Crosette, 2004; Gossman, 1991; Gossman & Iacopino, 1994; Kaur, 2002; Kumar, Singh, Agrwaal, & Kaur, 2003). According to human rights organizations, Indian security forces and Punjabi police tortured, “disappeared,” executed, and illegally cremated more than 10,000

Punjabi Sikhs. The present study used this population of survivors, a group that was not subject to the confounding effects of migration and resulting acculturation stress that are characteristic of much of the torture literature, to identify the contribution of chronic injuries sustained during torture to subsequent psychopathology.

## Method

Procedures and sampling method were designed to obtain a representative sample of plaintiffs involved in a class-action lawsuit against the Indian Government for illegally cremating Sikhs (or, in some cases, those mistaken for Sikhs) in Punjab in the 1980s and 1990s. Cremation records were kept by police and made public under a Federal investigation, and it was on these records that we based our sample. Of more than 2,000 illegal cremations registered by India’s Central Bureau of Investigation in two police districts in the city of Amritsar in the late 1980s and early 1990s, family members of 756 decedents were able to be identified by government investigators (based on available cremation records and physical descriptions of decedents, when available). Of the individuals identified, every fourth decedent (189 of 756) was selected from case records, and immediate family members for 160 decedents were contacted (84.7%); accurate contact information was unavailable for 29 families. Of these 160 individuals approached, none refused to participate, although only 130 attended their scheduled appointment at the central interviewing location in Amritsar (81.9%; 1 individual was interviewed about two separate family members who had been selected). Of the 29 who did not keep their appointment, most cited transportation difficulties or other scheduling conflicts as the reason. There were no significant differences on any available data (gender, age, relationship to deceased, and report of physical abuse of family members) between individuals who did not keep their scheduled appointment and those who did. All participants were informed of the nature and purpose of the interview, including both the preparation of a report for use in subsequent litigation as well as a journal publication, and consented to be evaluated. This study was approved by the Institutional Review Board of New York University School of Medicine.

Precautions were taken to identify and exclude data from any participants suspected of exaggerating symptoms, including a culture-neutral test of malingering (the Dot Counting Test; Binks, Gouvier, & Waters, 1997; see the *Measures* section below) and physical examinations of those individuals reporting long-term injuries or scars. All interviews were conducted by a research team consisting of three psychologists, one psychiatrist, and two primary care physicians, all of whom had had experience with trauma survivors and/or investigating human rights abuses. As none of the research team members spoke Punjabi, local interpreters were recruited and underwent 8 hr of training in which they were informed of the study objectives and familiarized with standards of interpreting for psychological assessment.

## Participants

Among the 130 participants, complete data were available for 116 participants. Of the 130, 3 were excluded because of their scores on the Dot Counting Task (see the Results section below),

and in 11 cases, logistical constraints (e.g., insufficient time to complete the evaluation) prevented completion of the CAPS, Structured Clinical Interview for DSM-IV (SCID; First, Gibbon, Spitzer, & Williams, 2004), or both. Of those in the complete sample of 116, almost two thirds were men ( $n = 72$ ; 62.1%), and the average age was 52.8 years ( $SD = 15.3$ ; range = 20–85). Two thirds ( $n = 76$ , 65.5%) were married at the time of the interview, whereas one third ( $n = 39$ , 33.6%) were widowed. More than half the sample had no formal education ( $n = 66$ , 56.9%), and the most common occupations were farming ( $n = 43$ , 37.1%), homemaking ( $n = 28$ , 24.1%), and unskilled labor ( $n = 16$ , 13.8%). Although all had experienced the sudden death of at least one family member at the hands of authorities, three-fourths ( $n = 91$ , 78.4%) reported some form of abusive contact with authorities themselves (described in the Method section). These direct experiences of abuse had taken place an average of 11.6 years before the interviews ( $SD = 4.2$ ).

### Measures

Participants' narratives of their experiences were interpreted from Punjabi into English and recorded (written) by research interviewers at the time of the interviews. Narratives of abuse for those participants with personal exposure to political violence were later reviewed by three researchers to determine whether they had been tortured according to criteria in the United Nations (UN) Definition of Torture. These criteria are as follows:

the term "torture" means any act by which severe pain or suffering, whether physical or mental, is intentionally inflicted on a person for such purposes as obtaining from him or a third person information or a confession, punishing him for an act he or a third person has committed or is suspected of having committed, or intimidating or coercing him or a third person, or for any reason based on discrimination of any kind, when such pain or suffering is inflicted by or at the instigation of or with the consent or acquiescence of a public official or other person acting in an official capacity. It does not include pain or suffering arising only from, inherent in or incidental to lawful sanctions. (United Nations, 1984, Article I)

This definition was operationalized using a checklist developed by Andrew Rasmussen that incorporates a categorical assessment of each adjectival and prepositional phrase of the definition. This checklist was applied to each trauma narrative, and consensus between the three raters was used to determine whether participants' experiences met the UN criteria for torture.

Participants were asked directly whether they were injured during their abuse and whether these injuries persisted to the present day. Those who responded positively received a physical examination by one of the study physicians in order to corroborate individuals' reports of injury with observable medical evidence, in accordance with standard torture examination procedures (e.g., Forrest, 1995). Reports of injuries that had healed were also recorded.

Research staff also administered the CAPS (Blake et al., 2004) to diagnose current PTSD and the SCID (First et al., 2004), major depression module to diagnose current major depressive episode (MDE). Following established procedures for translation of instruments (Bontempo, 1993), questions and prompts for the CAPS and SCID were translated into Punjabi, back-translated, the two ver-

sions compared, and items and prompts corrected prior to initiation of the study. The CAPS has been used effectively in several non-Western cultural groups (e.g., Hirihata et al., 2002; Malekzaie et al., 1996). Paired ratings were used, with a subset of cases, in order to assess interrater reliability of MDE and PTSD diagnoses. These data indicated a high degree of agreement between clinicians in these diagnoses, with kappa coefficients of .86 for current MDE and .70 for MDE in remission, 1.00 for current PTSD and .79 for PTSD in remission. The few discrepancies noted among these diagnoses were typically due to disagreement on a single symptom rating.

The Dot Counting Test (Binks et al., 1997) is a simple cognitive test used to identify individuals who may be exaggerating the severity of their psychological difficulties (i.e., malingering). Participants are asked to count a series of dots printed on a card, and scoring is based on the length of time required to count the dots as well as the accuracy of counting. This measure was selected because of its brevity and relative insensitivity to cultural factors, although to date no normative data on any non-Western samples have been published. Nevertheless, because of the possibility that some individuals may have been motivated to exaggerate the severity of their distress, incorporating a measure of symptom exaggeration was considered important to assessing the validity of self-report and interview-based data. Because normative data were unavailable, we examined the distribution of scores on this measure and considered outlier scores to be evidence of suspect reporting. Three participants obtained scores substantially higher ( $z > 2.0$ ) than the remainder of the sample and were subsequently excluded from subsequent data analysis.

### Results

Over half the participants' experiences of abuse ( $n = 61$ , 52.6%) met criteria for torture under the UN definition of torture. The most frequent types of torture were slapping, hitting, or kicking ( $n = 43$ , 37.1%); assault with an object ( $n = 36$ , 31.0%), suspension from ceiling from hands tied behind the back ( $n = 29$ , 25.0%), stretching legs laterally to a 180° angle ( $n = 28$ , 24.1%), and rolling large iron or concrete bars over limbs ( $n = 20$ , 17.2%). A smaller proportion of women ( $n = 17$  of 44, or 38.6%) had been tortured than men ( $n = 44$  of 72, or 61.1%),  $\chi^2(1, N = 116) = 5.23, p < .05$ , odds ratio (OR) = .41, 95% confidence interval (CI): .19, .89.

Over one third of the sample ( $n = 42$ , 36.2%) reported chronic injuries resulting from these abusive experiences. Three of these individuals were not classified as having been tortured, as their abuse did not meet UN criteria. Study physicians examined 35 of the injured individuals (79.5%), and in all cases medical evidence was consistent with participants' reports. The most commonly reported symptoms were musculoskeletal ( $n = 30$ , 25.8% of the full sample), followed by dermatological complaints ( $n = 19$ , 16.3%), injuries to the face or head ( $n = 10$ , 8.6%); and ear, eyes, nose, and throat problems ( $n = 9$ , 7.6%). Functional problems reported as a result of physical abuse included difficulty ambulating ( $n = 22$ , 19.0%) and problems performing activities of daily living (e.g., cleaning oneself;  $n = 11$ , 9.5%). An additional 44 (34.6%) reported that they had sustained injuries but that these injuries had healed. Roughly one third of the sample was diagnosed with current PTSD ( $n = 39$ , 34.5%). Rates of MDE were

somewhat higher, with 37.1% ( $n = 43$ ) meeting criteria. One fifth of the sample met criteria for PTSD in remission ( $n = 24$ , 20.2%) and over one third MDE in remission ( $n = 45$ , 37.8%).

Univariate associations (phi coefficients) between variables of interest are presented in Table 1. As presented, there was considerable positive association between torture, chronic injuries, current PTSD, and current MDE. Of the 39 individuals diagnosed with PTSD, 27 (69.2%) had been tortured. In marked contrast, current MDE was not associated with torture (but was associated with the presence of chronic injuries).

In order to investigate the role chronic injuries played in the relationship between torture and psychological distress, we examined the possibility of mediating and moderating effects using logistic regression, consistent with Baron and Kenny (1986) as well as with more recent work (Judd, Kenny, & McClelland, 2001; Kenny, Kashy, & Bolger, 1998). In the first block, we included gender, age, and education level in order to control for oft-cited associations between PTSD and depression and these demographic variables. However, none were associated with PTSD or MDE in the current sample.

Table 2 presents logistic regression results for moderation and mediation analyses. The interaction between torture and chronic injury did not significantly predict MDE, suggesting that injury did not moderate the relationship between torture and MDE (Model I in Table 2). As MDE was not associated with torture, there were no direct effects of MDE to mediate (Model II). The interaction between torture and chronic injury did not significantly predict PTSD (Model III), suggesting that injury did not moderate the relationship between torture and PTSD. There was, however, a strong mediation effect for this relationship (Model IV). Consistent with Baron and Kenny (1986), we first examined the independent effect of torture on injury ( $B = 3.37$ ,  $OR = 29.05$ ), followed by the independent effects of torture on PTSD and chronic injury on PTSD ( $B = 0.93$ ,  $p < .05$ ;  $OR = 2.53$ ; and  $B = 1.48$ ,  $p < .001$ ;  $OR = 4.39$ , respectively; these effect sizes are presented in parentheses in Figure 1). When torture and injury were entered simultaneously into a regression equation predicting PTSD (Model IV in Table 2 and Figure 1), the effect size for torture was reduced to near zero ( $OR = 1.03$ ,  $ns$ ;  $B_1$  in Figure 1), whereas the effect for injury was virtually unchanged ( $OR = 4.30$ ;  $B_2$ ).<sup>1</sup> Reports of injuries that had healed were associated with PTSD,  $\chi^2(1, N = 116) = 4.18$ ,  $p = .041$ ,  $OR = 2.25$ , but did not moderate or mediate the effect of torture on PTSD, and they were not associated with diagnoses of MDE.

In order to further investigate the effect of injury on the relationship between torture and PTSD, we used linear regression

Table 1  
*Phi Coefficients of Association Between Torture, Chronic Injury, PTSD, and MDE*

Variable	1	2	3	4
1. Torture	—	.62**	.23*	.11
2. Injury		—	.35**	.29**
3. PTSD			—	.51**
4. MDE				—

Note. PTSD = posttraumatic stress disorder; MDE = major depressive episode.

\*  $p < .05$ . \*\*  $p < .01$ .

equations predicting CAPS total severity ratings and for individual clusters of PTSD symptoms. Following current empirical and theoretical research suggesting that avoidance and numbing are distinct phenomena in U.S. and non-Western samples (King, Leskin, King, & Weathers, 1998; Litz, 1992; Rasmussen, Smith, & Keller, 2007; Simms, Watson, & Doebbell, 2002), we divided Criterion C symptom severity scores into separate avoidance and numbing components. Results are presented in Table 3. We found that injury mediated the effect of torture on total PTSD severity and the severity of numbing symptoms. Arousal severity was only marginally associated with torture ( $\beta = .164$ ,  $p = .10$ ), but this weak effect was mediated by injury (although, again, this association was marginal). For intrusion and avoidance severity, each were associated with torture (although intrusion was only marginally associated;  $\beta = .165$ ,  $p = .10$  and  $\beta = .223$ ,  $p < .05$ , respectively) and current injury ( $\beta = .261$ ,  $p < .01$  and  $\beta = .223$ ,  $p < .05$ , respectively), but when both were entered into regression models, their effects on symptom severity were null.

## Discussion

The present study examined moderating and mediating effects of physical trauma sustained during human rights violations on psychological trauma symptoms in a sample of Punjabi Sikhs. Access to such a sample represents a substantial contribution to the literature, as most investigations of survivors of such abuse usually take place in refugee camps or after significant migration, and thus include confounding stressors. Moreover, the use of "gold standard" clinician-rated diagnostic instruments allowed for highly reliable clinical diagnoses of PTSD and MDE.

Consistent with literature on injuries and trauma (e.g., Blanchard et al., 1997; Koren et al., 2005), we found that chronic injuries sustained during torture and other forms of political violence were robust predictors of long-term psychopathology, even beyond the effects of torture itself. Consistent with literature on injury and PTSD, there was a clear relationship between chronic injuries and PTSD among those tortured in the present sample. Whereas previous work has posited injury as a moderator of PTSD (e.g., Kilpatrick et al., 1989), we found that the effect of torture was fully mediated by chronic injuries. That this effect was primarily limited to numbing symptoms is consistent with the frequent finding that it is Criterion C, avoidance and numbing, that best predicts PTSD (Nemeroff et al., 2006), although there was a marginal effect on arousal symptoms as well. We do not view these findings as contradictory to prior research. That the effect of torture was indirect (i.e., mediated by injury) is related to the length of time between torture and assessment: Current PTSD was diagnosed an average of 11.5 years after trauma. Had we undertaken our study within the first year following abuse, when PTSD

<sup>1</sup> Given that the association between torture and chronic injury was large ( $\phi = .62$ ), we were concerned that we might not retain enough power to test the parameters in Model IV. Strong association between the predictor and mediating variable reduces the effective sample size needed to accurately predict the other effects in the model. The resulting effective sample size is approximated by  $N(1 - r^2)$ , where  $N$  is the sample size, and  $r$  is the phi coefficient. For our sample, our effective sample size was thus 71.41, which provided us with sufficient power to estimate the logistic regression coefficients.

Table 2  
Logistic Regression Equations Predicting MDE and PTSD From Torture and Chronic Injury

Variable	B	SE	Wald $\chi^2$	df	p	OR	95% CI	
							Lower	Upper
Model I: MDE								
Torture	-0.810	.784	1.068	1	.301	0.445	0.096	2.067
Injury	1.611	.579	7.738	1	.005	5.008	1.610	15.585
Torture $\times$ Injury	0.118	.272	0.190	1	.663	1.126	0.661	1.917
Model II: MDE								
Torture	-0.577	.564	1.046	1	.307	0.561	0.186	1.698
Injury	1.660	.569	8.497	1	.004	5.259	1.723	16.055
Model III: PTSD								
Torture	-0.038	.765	0.002	1	.961	0.963	0.215	4.313
Injury	1.436	.559	6.596	1	.010	4.203	1.405	12.573
Torture $\times$ Injury	0.035	.271	0.016	1	.898	1.035	0.609	1.761
Model IV: PTSD								
Torture	0.031	.554	0.003	1	.955	1.032	0.349	3.056
Injury	1.459	.549	7.048	1	.008	4.300	1.465	12.623

Note. MDE = major depressive episode; PTSD = posttraumatic stress disorder; OR = odds ratio; CI = confidence interval.

without injury was more prevalent, injury might have moderated the path between torture and PTSD. As many noninjured cases of PTSD remitted over time, the role of injury in the sample may have changed from moderation to mediation. Clinically important here is that untreated physical injuries sustained during torture have dire long-term psychological consequences. It follows that with adequate early medical attention, many, if not most, of these consequences could be prevented.

The finding that injury mediates the effect of torture on long-term PTSD provides some clues as to the mechanisms by which these variables interact. Injuries may be a proxy for the severity of the torture experience, as lasting injuries may be associated with harsher physical abuse. One theory presently gaining acceptance is that the intensity of fear and dissociation experienced at time of trauma is the single strongest predictor of the development of PTSD (Marmar et al., 2005; Morgan et al., 2001; Nixon, Resick, & Griffin, 2003). That reports of injuries that had healed did not mediate or moderate this relationship support this “severity hypothesis.” We also considered that injuries might serve as traumatic cues from which torture survivors cannot escape—daily reminders that continually sensitize individuals to their traumatic experiences and thereby exacerbate or maintain PTSD symptoms, akin to recurring nightmares (Rothbaum & Mellman, 2001). However, given that injuries were not associated with posttraumatic intrusion symptoms, this hypothesis is unlikely.

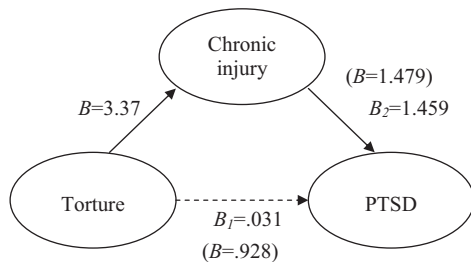


Figure 1. Chronic injury mediates the relationship between torture and posttraumatic stress disorder (PTSD).

Inconsistent with previous literature (e.g., Holtz, 1998; Mollica, 2004), diagnosis of MDE was not associated with torture, although depression was associated with chronic injuries. These findings may be specific to survivors of political violence. This sample was subject to multiple severe experiences of oppression, including loss of income, restriction of movement and resulting social isolation, and death and disappearance of family members. Because most individuals were subject to so many severe and traumatic experiences, the unique contribution of torture to the broader construct of “depression” may have been overshadowed, whereas a significant association with PTSD remained. That PTSD and trauma-related depression have different etiologies within the same sample has been observed in other persecuted populations (Momartin et al., 2004) and emphasizes the multidimensional

Table 3  
Linear Regressions Predicting PTSD (CAPS) Symptom Severity From Torture and Chronic Injury

Variable	B	SE	$\beta$	95% CI for B	
				Lower	Upper
Total CAPS severity					
Tortured	0.670	7.288	.011	-13.798	15.137
Injury	19.050	7.243	.321**	4.673	33.427
Intrusion severity					
Tortured	1.068	2.367	.057	-3.631	5.766
Injury	3.285	2.352	.176	-1.384	7.954
Avoidance severity					
Tortured	1.365	1.245	.137	-1.106	3.837
Injury	1.382	1.233	.140	-1.066	3.830
Numbing severity					
Tortured	0.873	2.490	.043	-4.069	13.731
Injury	5.166	2.474	.258*	0.256	10.077
Arousal severity					
Tortured	2.353	3.427	.085	-4.449	9.155
Injury	6.574	3.405	.238†	-0.185	13.334

Note. PTSD = posttraumatic stress disorder; CAPS = Clinician Administered PTSD Scale; CI = confidence interval.  
†  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ .

phenomenology of suffering among those subject to political violence.

The lack of association between PTSD and demographic variables (age, gender, education) is also inconsistent with prior studies. Multiple epidemiological studies have shown that both PTSD and major depression are more common among women than men (American Psychiatric Association, 2000), and at first our finding that there were no statistical differences seems to counter this trend. However, null predictive effects of gender on PTSD are not uncommon in the torture treatment literature (e.g., Mollica et al., 1999; Momartin et al., 2004) and may be related to the extreme nature of the stressors under investigation (Nemeroff et al., 2006). As about half the present sample was composed of torture survivors, this hypothesis seems reasonable. However, null effects in this study may also be due to the fact that torture was less likely for women than men, or that women in this sample were subject to less severe abuse than men. Education is often found to be a protective factor among U.S. trauma samples (e.g., Green, Grace, Lindy, Gleser, & Leonard, 1990), presumably because of associated levels of cognitive ability to integrate trauma events. However, higher education and social status pretrauma has been found to be a risk factor among refugee samples (Porter & Haslam, 2005), perhaps because those with higher education experience a greater loss of status. The present study's null findings may either indicate some combinations of these explanations or be related to restricted variance due to the large proportion of uneducated and minimally educated participants in this particular sample.

Clearly a limitation of this study is that the data are not longitudinal. Ideally, we would have followed participants over time to test our hypothesis that those who remit spontaneously are those who were not injured or whose injuries heal faster. It may be that there were other factors that better delineated suffering so long after the trauma event. In addition, although we used "gold standard" diagnostic interview schedules and a rigorous method of translation-back-translation and interpreter training, these instruments have not been validated in Punjabi samples. Finally, despite our use of a test of malingering, the fact that participants were involved in a civil lawsuit may be reason to suspect that some participants may have exaggerated reports of distress in order to improve their chances for a favorable judicial decision. However, one might expect that the legal context for this study would have resulted in precisely the opposite findings because individuals without lasting physical injuries would have a stronger claim for damages if they reported psychological symptoms. Thus, it appears unlikely that the findings regarding mediation were influenced by the legal context in which data were collected.

Traumatic events in and of themselves may not account for the major share of the variance in psychiatric outcomes, particularly in the long term. Further research investigating the connection between PTSD and experiences of injury is clearly needed. In particular, the effects of rapid medical attention may be critical to reducing the frequency and severity of subsequent psychopathology. Our data suggest that persistent physical injuries can have long-term psychological consequences and highlight the need for interdisciplinary approaches to caring for survivors of torture in which medical, psychological, and social needs are all addressed (e.g., Keller, Saul, & Eisenman, 1998). In this study, many of the injuries observed could have been resolved effectively had medical resources been available to this indigent sample. Unfortunately,

most of the nations that practice torture also suffer from under-resourced medical infrastructures, making healing torture survivors doubly difficult and exacerbating the psychological damage caused by torture.

## References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.
- Amnesty International. (2003). *India: Break the cycle of impunity and torture in Punjab*. London: Author.
- Banks, S., & Kerns, R. (1996). Explaining high rates of depression in chronic pain: A diathesis-stress framework. *Psychological Bulletin*, *119*, 95–110.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173–1182.
- Binks, P. G., Gouvier, W. D., & Waters, W. F. (1997). Malingering detection with the Dot Counting Test. *Archives of Clinical Neuropsychology*, *12*, 41–46.
- Blake, D. D., Weathers, F. W., Nagy, L. M., Kaloupek, D. G., Charney, D. S., & Keane, T. M. (2004). *Clinician-administered PTSD scale*. Los Angeles: Western Psychological Services.
- Blanchard, E. B., Hickling, E. J., Forneris, C. A., Taylor, A. E., Buckley, T. C., Loos, W. R., & Jaccard, J. (1997). Prediction of remission of acute posttraumatic stress disorder in motor vehicle accident victims. *Journal of Traumatic Stress*, *10*, 215–234.
- Bontempo, R. (1993). Translation fidelity of psychosocial scales: An item response theory analysis of an individualism versus collectivism scale. *Journal of Cross-Cultural Psychology*, *24*, 149–166.
- Breslau, N., Davis, G. C., Peterson, E. L., & Schultz, L. R. (2000). A second look at comorbidity in victims of trauma: The post-traumatic stress disorder-major depression connection. *Biological Psychiatry*, *48*, 902–909.
- Crosette, B. (2004). India's Sikhs: Waiting for justice. *World Policy Journal*, *XXI*, 70–77.
- de Jong, J. T. V., Komproe, I. H., van Ommeren, M., El Masri, M., Araya, M., Khaled, N., et al. (2001). Lifetime events and posttraumatic stress disorder in four postconflict settings. *Journal of the American Medical Association*, *286*, 555–562.
- Delahanty, D. L., Raimonde, A. J., Spoonster, E., & Cullado, M. (2003). Injury severity, prior trauma history, urinary cortisol levels, and acute PTSD in motor vehicle accident victims. *Journal of Anxiety Disorders*, *17*, 149–164.
- First, M. B., Gibbon, M., Spitzer, R. L., & Williams, J. B. W. (2004). *Structured clinical interview for DSM-IV-TR*. Arlington, VA: American Psychiatric Publishing.
- Forrest, D. (1995). The physical after-effects of torture. *Forensic Science International*, *76*, 77–84.
- Gossman, P. (1991). *Punjab in crisis*. New York: Human Rights Watch.
- Gossman, P., & Iacopino, V. (1994). *Dead silence: The legacy of abuses in Punjab*. New York: Human Rights Watch and Physicians for Human Rights.
- Green, B. L., Grace, M. C., Lindy, J. D., Gleser, G. C., & Leonard, A. (1990). Risk factors for PTSD and other diagnoses in a general sample of Vietnam veterans. *American Journal of Psychiatry*, *147*, 729–733.
- Hirihata, S., Konishi, T., Shirakawa, M., Asakawa, C., Morita, N., & Nakatani, Y. (2002). Posttraumatic stress disorder in victims of sexual assault related to depression or physical symptoms. *Seishin Shinkeigaku Zasshi. Psychiatria Et Neurologia Japonica-Psychiatric Neurology Japonica*, *104*, 529–550.
- Holtz, T. (1998). Refugee trauma versus torture trauma: A retrospective controlled cohort study by Tibetan refugees. *Journal of Nervous & Mental Disease*, *186*, 24–34.

- Jaranson, J. M., Butcher, J., Halcon, L., Johnson, D. R., Robertson, C., Savik, K., et al. (2004). Somali and Oromos refugees: Correlates of torture and trauma history. *American Journal of Public Health, 94*, 591–598.
- Judd, C. M., Kenny, D. A., & McClelland, G. H. (2001). Estimating and testing mediation and moderation in within-subject designs. *Psychological Methods, 6*, 115–134.
- Kaur, J. (2002). A judicial blackout: Judicial impunity for disappearance in Punjab, India. *Harvard Human Rights Journal, 15*, 269–300.
- Keller, A. S., Saul, J. M., & Eisenman, D. P. (1998). Caring for survivors of torture in an urban, municipal hospital. *Journal of Ambulatory Care Management, 21*, 20–29.
- Kenny, D. A., Kashy, D. A., & Bolger, N. (1998). Data analysis in psychology. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (Vol. 1, 4th ed., pp. 233–265). Boston: McGraw-Hill.
- Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry, 52*, 1048–1060.
- Kilpatrick, D. G., Saunders, B. E., Amick-McMullan, A., Best, C. L., Veronen, L. J., & Resnick, H. S. (1989). Victim and crime factors associated with the development of crime-related posttraumatic stress disorder. *Behavior Therapy, 20*, 199–214.
- King, D. W., Leskin, G. A., King, L. A., & Weathers, F. W. (1998). Confirmatory factor analysis of the clinician-administered PTSD scale: Evidence for the dimensionality of posttraumatic stress disorder. *Psychological Assessment, 10*, 90–96.
- Koren, D., Norman, D., Cohen, A., Berman, J., & Klein, E. M. (2005). Increased PTSD risk with combat-related injury: A matched comparison study of injured and uninjured soldiers experiencing the same combat events. *American Journal of Psychiatry, 162*, 276–282.
- Kouyanou, K., Pither, C., Rabe-Hesketh, S., & Wessley, S. (1998). A comparative study of iatrogenesis, medication abuse, and psychiatric comorbidity in chronic pain patients with and without medically explained symptoms. *Pain, 76*, 417–426.
- Kumar, R. N., Singh, A., Agrwaal, A., & Kaur, J. (2003). *Reduced to ashes: The insurgency and human rights in Punjab (Final report: Volume one)*. Katmandu, Nepal: South Asia Forum for Human Rights.
- Litz, B. T. (1992). Emotional numbing in combat-related post-traumatic stress disorder: A critical review and reformulation. *Clinical Psychology Review, 12*, 417–432.
- Malekzaie, A. S., Niazi, J. M., Paige, S. R., Hendricks, S. E., Fitzpatrick, D., Leuschen, M. P., & Millimet, C. R. (1996). Modification of the CAPS-1 for diagnosis of Afghan refugees. *Journal of Traumatic Stress, 9*, 891–898.
- Marmar, C. R., Metzler, T., Best, S., Otte, C., Pole, N., Chemtob, C., et al. (2005, September 11–13). Examining biological and psychological predictors of PTSD using prospective, longitudinal studies. Presentation to the New York Academy of Sciences conference, Psychobiology of PTSD: A decade of progress. Mt. Sinai Medical School, New York, NY.
- Mollica, R. F. (2004). Surviving torture. *New England Journal of Medicine, 351*, 5–7.
- Mollica, R. F., McInnes, K., Sarajlic, N., Lavelle, J., Sarajlic, I., & Massagli, M. P. (1999). Disability associated with health status in Bosnian refugees living in Croatia. *Journal of the American Medical Association, 281*, 433–439.
- Mollica, R. F., Wyshak, G., & Lavelle, J. (1987). The psychosocial impact of war trauma and torture on Southeast Asian refugees. *American Journal of Psychiatry, 144*, 1567–1572.
- Momartin, S., Silove, D., Manicavasagar, V., & Steel, Z. (2004). Comorbidity of PTSD and depression: Association with trauma exposure, symptom severity and functional impairment in Bosnian refugees resettled in Australia. *Journal of Affective Disorders, 80*, 231–238.
- Morgan, C. A., Hazlett, G., Wang, S., Richardson, E. G., Schnurr, P., & Southwick, S. M. (2001). Symptoms of dissociation in humans experiencing acute, uncontrollable stress: A prospective investigation. *American Journal of Psychiatry, 158*, 1239–1247.
- Nemeroff, C. B., Bremner, D. J., Foa, E. B., Mayberg, H. S., North, C. S., & Stein, M. B. (2006). Posttraumatic stress disorder: A state-of-the-science review. *Journal of Psychiatric Research, 40*, 1–21.
- Nice, D. S., Garland, C. F., Hilton, S. M., Baggett, J. C., & Mitchell, R. E. (1997). Long-term health outcomes and medical effects of torture among US Navy prisoners of war in Vietnam. *Journal of the American Medical Association, 276*, 375–381.
- Nixon, R. V. D., Resick, P. A., & Griffin, M. G. (2003). Panic following trauma: The etiology of acute posttraumatic arousal. *Journal of Anxiety Disorders, 18*, 193–210.
- Ohayon, M. M., & Schatzberg, A. F. (2003). Using chronic pain to predict depressive morbidity in the general population. *Archives of General Psychiatry, 60*, 39–47.
- Polatin, P., Kinney, R., Gatchel, R., Lillo, E., & Mayer, T. (1993). Psychiatric illness and chronic low-back pain: The mind and the spine— which goes first? *Spine, 18*, 66–71.
- Porter, M., & Haslam, N. (2005). Predisplacement and postdisplacement factors associated with mental health of refugees and internally displaced persons. *Journal of the American Medical Association, 294*, 602–612.
- Rasmussen, A., Smith, H., & Keller, A. S. (2007). Factor structure of PTSD symptoms among West and Central African refugees. *Journal of Traumatic Stress, 20*, 271–280.
- Rothbaum, B. O., & Mellman, T. A. (2001). Dreams and exposure therapy in PTSD. *Journal of Traumatic Stress, 14*, 481–490.
- Sharp, T. J., & Harvey, A. G. (2001). Chronic pain and posttraumatic stress disorder: Mutual maintenance? *Clinical Psychology Review, 21*, 857–877.
- Shrestha, N. M., Sharma, B., Van Ommeren, M., Regmi, S., Makaju, R., Kompoe, I., et al. (1998). Impact of torture on refugees displaced within the developing world: Symptomatology among Bhutanese refugees in Nepal. *Journal of the American Medical Association, 280*, 443–448.
- Simms, L. J., Watson, D., & Doebbellin, B. N. (2002). Confirmatory factor analyses of posttraumatic stress symptoms in deployed and non-deployed veterans of the Gulf War. *Journal of Abnormal Psychology, 111*, 637–647.
- Tang, S. S., & Fox, S. H. (2001). Traumatic experiences and the mental health of Senegalese refugees. *Journal of Nervous and Mental Disease, 189*, 507–512.
- Thomsen, A. B., Eriksen, J., & Smidt-Nielsen, K. (2000). Chronic pain in torture survivors. *Forensic Science International, 108*, 155–163.
- United Nations. (1984). *Convention against torture and other cruel, inhuman or degrading treatment or punishment*. Retrieved October 15, 2005, from <http://www.un.org/documents/ga/res/39/a39r046.htm>
- Winfield, I., George, L. K., Swartz, M., & Blazer, D. G. (1990). Sexual assault and psychiatric disorders among a community sample of women. *American Journal of Psychiatry, 147*, 335–341.

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