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Trauma Exposure, Posttraumatic Stress Disorder Symptoms Trajectory, and Disability Level Among Hospitalized Injury Survivors in Kenya

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Abstract

Potentially traumatic events (PTEs) have been consistently associated with posttraumatic stress disorder (PTSD). However, the extent of association and attribution to subsequent disability has varied, with limited studies conducted in urban low-income contexts. This longitudinal study estimated the trajectory of PTSD symptoms up to 7 months after hospitalization and the associated disability level among adult patients who had been hospitalized due to injury. Adult injury patients ($N = 476$) admitted to Kenyatta National Hospital in Nairobi, Kenya, were interviewed in person in the hospital, and via phone at 1, 2–3, and 4–7 months after hospital discharge. Using latent growth curve modeling, two trajectories of PTSD symptoms emerged: (a) persistently elevated PTSD symptoms (9.2%), and (b) low PTSD symptoms (90.8%). Number of PTEs experienced remained moderately associated with the elevated trajectory after controlling for in-hospital depressive symptoms. Having previously witnessed killings or serious injuries, $AOR = 2.32$, 95% CI [1.07, 5.05]; being female, $AOR = 4.74$, 95% CI [4.53, 4.96]; elevated depressive symptoms during hospitalization, $AOR = 2.96$, 95% CI [1.28, 6.83]; and having no household savings/assets, $AOR = 1.28$, 95% CI [1.13, 1.44], were associated with the elevated PTSD symptoms trajectory class after controlling for other risk factors. Latent membership in the elevated PTSD trajectory was associated with a significantly higher level of disability several months after hospital discharge, $p < .001$, after controlling for injury and demographic characteristics. These results underline the associations between in-hospital depressive symptoms, witnessing atrocities, and poverty and an elevated PTSD symptoms trajectory.

Introduction

Globally, injuries affect hundreds of millions of people each year, accounting for 10% of the global burden of disease (Haagsma et al., 2016). This burden has been disproportionately

high in low- and middle-income countries (LMICs), which comprise 90% of the injury burden (Herbert, Hyder, Butchart, & Norton, 2011). Mental health issues are common consequences of injury (Wiseman, Foster, & Curtis, 2013). Prior studies have found posttraumatic stress symptoms among the most frequently reported mental health consequences of acutely injured civilian survivors (Zatzick et al., 2007), with symptoms remaining elevated months and years after the injury (O'Donnell et al., 2016). Despite the majority of injury burden falling on LMICs, most of the literature on longitudinal posttraumatic stress disorder (PTSD) outcomes among injury populations has been conducted in high-income countries (Heron-Delaney, Kenardy, Charlton, & Matsuoka, 2013; Wiseman et al., 2013).

Previous studies have identified a range of risk factors for the development and maintenance of PTSD symptoms, but not all risk factors have been consistently found across different populations (Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003). Among the few risk factors consistent in predicting PTSD, potentially traumatic events (PTEs) have shown varying extents of association with PTSD across populations and study characteristics (Brewin et al., 2000). This underscores the need for better understanding of PTEs and their association with subsequent PTSD symptoms among injury survivors. A study by Irish and colleagues (2008) among U.S. among motor vehicle accident survivors found that cumulative types of PTEs and distress after the injury were the most significant trauma history risk factors for PTSD symptoms. The authors hypothesized that characteristics of PTEs may increase the risk an individual will negatively evaluate the traumatic event or inhibit one's ability to respond to stressful environmental events (Irish et al., 2008). These, in turn, increase one's vulnerability to the development of PTSD symptoms after subsequent trauma exposure.

Despite the construct of PTSD being identified across many different sociocultural settings (Hinton & Lewis-Fernandez, 2011), limited research has been available on understanding the extent of the longitudinal burden from PTSD symptoms from injuries and the associated disability level in LMICs. Additionally, few studies have focused on the role of PTEs in PTSD symptoms after injury in LMICs.

Kenya is a rapidly developing lower-middle income country with an increased burden of injuries in the last decade (Bachani et al., 2012; Institute for Health Metrics and Evaluation [IHME], 2016). Studies have suggested a high level of trauma experiences among the general population in Kenya (Harder, Mutiso, Khasakhala, Burke, & Ndeti, 2012; Jenkins et al., 2015). Research focused on survivors of motor vehicle crashes and a terrorist event in Kenya has shown evidence of elevated PTSD burden (Ongecha-Owuor, Kathuku, Othieno, & Ndeti, 2004; Zhang et al., 2013). Ongecha-Owuor et al. (2004) found a PTSD prevalence of 13% at 1 month after a motor vehicle crash among survivors who were attending the orthopedic and trauma clinic in the national hospital. Another study conducted after a specific terrorist event (the United States embassy bombing in Nairobi) found that over one-quarter of survivors had PTSD 3 years after the terrorist event (Zhang et al., 2013). Besides the specific index trauma, the burden of PTSD symptoms among adult survivors of general traumatic injury (motor vehicle crash, falls, and assault) and the association between characteristics of PTEs and PTSD symptoms remain unclear.

In this study, we aimed to (a) estimate the course of PTSD symptoms among hospitalized adult injury survivors between 1 month and 4–7 months posthospitalization; (b) estimate the association of identified risk factors and characteristics of PTEs with the course of higher PTSD symptoms; and (c) estimate the associated disability level by the courses of PTSD symptoms, adjusting for direct association with baseline characteristics.

Method

Participants

This study included adults who were recruited to participate in the longitudinal study Health, Economic and Long-term Social Impact of Injuries (HEALS) in Kenya. Participants were recruited between May and December 2015 in Nairobi, Kenya at Kenyatta National Hospital. This public hospital provides the highest level of care and is the largest referral and teaching hospital in the country. Recruitment was conducted in wards that admit trauma patients: orthopedic, general surgical, ear and throat, head and abdominal, and burn wards as well as burn units. Patients were recruited for the study if they met the following inclusion criteria: (a) had experienced one or more injuries (including intentional and unintentional) that required hospital admission of at least 24 hours; (b) were 18 years of age or older; (c) were able to communicate in Swahili or English; (d) resided in Kenya and intended to stay in Kenya after hospital discharge; and (e) were able to provide informed consent and to be interviewed at the time of enrollment, based on consciousness and coherence in cases of head injury. Patients were excluded in this study if they (a) were admitted to hospital due to self-harm, (b) self-reported to have been diagnosed with any mental disorder(s) prior to injury, or (c) did not survive through hospitalization.

Eligible patients were consecutively enrolled during weekdays over a 7-month period. Of 1,038 patients who were approached for study recruitment, 1,004 (96.7%) provided informed consent to participate in the parent study. Of those, 961 met the inclusion criteria for the current study. Due to an issue with data quality for one data collector, participants recruited and followed-up by this data collector were excluded from this study ($n = 317$, 33.0%). Among the 644 patients (67.0% of individuals who met inclusion criteria) who completed the baseline interview, the final sample for the current study consisted of 476 patients (49.5% of individuals who met inclusion criteria and 73.6% of individuals who completed baseline measures) who completed at least one follow-up after hospital discharge that included a measure of PTSD symptoms (Figure 1). In comparison with patients who completed the baseline interview, this final sample of participants was less likely to be male (27.9% men vs. 14.1% women were lost to follow-up, $p = .005$), injured by assault (36.2% assault patients vs. 23.1% unintentional injury patients were lost to follow-up, $p = .002$), and covered by medical insurance (29.5% no medical insurance coverage vs. 14.7% with medical insurance coverage were lost to follow-up, $p < .001$). Participants who did not complete follow-up within 4–7 months after discharge did not differ with statistical significance from those who completed the last follow-up in terms of sex, age, highest education level, occupation, urban versus rural residence, marital status, cause of injury, injury severity level, coverage of medical insurance, having household savings or assets, having borrowed money for hospital treatment, and the various types and number of PTEs.

Procedure

Three trained data collectors obtained informed consent and conducted baseline assessments in the hospital. Baseline assessment included an initial interview upon enrollment to collect demographic information, information about the injury event, preinjury disability level, exposure to PTEs, and a self-report measure of depression and anxiety symptoms since the injury. An exit interview was conducted with each participant regarding in-hospital payment, expenses, and assistance received. Subsequent follow-up interviews after hospital discharge were conducted by phone. At least three attempts were made, on both weekdays and weekends, to reach each participant. Participants who could not be reached at the time of the first follow-up were contacted again in subsequent follow-ups.

Questions during follow-up included self-report measures of PTSD symptoms, assessment of disability, and rehabilitation and treatment received since the injury. Each follow-up interview took 20–30 min to complete. This study received Institutional Review Board approval from Johns Hopkins University Bloomberg School of Public Health in the United States and the Ethics Review Committee of University of Nairobi and Kenyatta National Hospital in Kenya.

Measures

PTSD symptoms.—We used the PTSD Checklist for *DSM-V* (PCL-5) (Blevins, Weathers, Davis, Witte, & Domino, 2015) to measure PTSD symptoms. PCL-5 is a 20-item instrument. The previous version of the PTSD Checklist for *DSM-IV* (PCL-4) has been widely applied in various non-Western contexts and frequently used as a self-report measure of PTSD for clinical screening and symptoms checking (Li et al., 2010; Tsutsumi, Izutsu, Poudyal, Kato, & Marui, 2008). The PCL-5 has been translated and adapted as a screening instrument for service provision in clinics supported by an international nongovernmental organization (NGO): World Vision in Kenya. Responses were measured using a 5-point Likert scale (0 = *not at all* to 4 = *extremely*) with reference to the injury event. A total item score (sum of the 20 items) was calculated for each participant (1-month, range: 0–33, $M = 5.20$, $SD = 6.14$; 2–3 month, range: 0–44, $M = 4.58$, $SD = 6.07$; and 4–7 month, range: 0–50, $M = 4.35$, $SD = 6.12$). In this study, we used the translated Swahili version of the PCL-5 implemented by the NGO. The instrument demonstrated good internal consistency in the current sample (Cronbach's $\alpha = .83$).

Depressive symptoms in hospital.—We used the 15-item Depression subscale of the Hopkins Symptoms Checklist (HSCL-25) (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974) to measure depressive symptoms during hospitalization. The instrument has demonstrated good interrater reliability, test–retest reliability, and content validity in Tanzania (Lee, Kaaya, Mbawambo, Smith-Fawzi, & Leshabari, 2008) and has frequently been used in the eastern Sub-Saharan Africa region (Kaaya et al., 2002; Lundberg, Cantor-Graae, Rukundo, Ashaba, & Ostergren, 2009). The Depression subscale demonstrated robust performance across eight LMICs, including Uganda and Rwanda (Haroz et al., 2016). Responses were measured using a 4-point Likert scale (1 = *not at all*, to 4 = *extremely*). As is commonly reported in the literature, we generated a mean score of the 15 items (range: 1–2.67; $M = 1.28$, $SD = 0.27$). In this study, we used the Tanzanian version of HSLC-25 that

was adapted by Lee et al. (2008). The Depression subscale demonstrated acceptable internal consistency in the current sample (Cronbach's $\alpha = .71$).

PTEs.—The 10-item self-report Brief Trauma Questionnaire was used to assess the exposure to various types of PTEs. Derived from the Brief Trauma Interview (Schnurr, Spiro, Vielhauer, Findler, & Hamblen, 2002), the Brief Trauma Questionnaire provides a complete assessment of PTSD Criterion A as outlined in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)* and has been used among nurses and civilians to assess trauma exposure (Kubzansky et al., 2014). The instrument includes common types of PTEs, and respondents indicate which ones they have experienced. The measure is succinct and feasible for implementation, however, it does not ask respondents to differentiate between the event that led to the hospitalization from other experienced PTEs. For each PTE, the respondent answers questions about whether he or she was seriously injured, thought he or she might be seriously injured, or felt his or her life was threatened. Additional questions regarding participants' ages at the time of exposure for each PTE were included to identify when participants experienced the PTE and whether there had been multiple potential occurrences of the event. Age at the time of exposure for each PTE and the intent of current injury (unintentional vs. assault) was used in a proxy analysis to identify PTE that led to the hospitalization. Following the design of the measure, all reported cases of PTE were used in analyses. The following variables were generated for analyses: exposure to any PTEs (binary indicator), number of types of PTE (count of types of PTE experienced), number of PTEs (sum of number of exposure across the 10 types of PTE), and serious traumatic injury in any PTEs (binary indicator, positive if participant had been seriously injured for any of the PTEs). Each of these variables was included as separate predictor.

Level of disability.—The World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0) short form (Üstün, Kostanjsek, Chatterji, & Rehm, 2010) is a 12-item self-report instrument that was used to assess each participant's domains of functioning associated with a health condition caused by the injury that led to hospitalization, including cognition, mobility, self-care, getting along with other people, life activities, and participation in community activities. The instrument has been used to measure disability among general populations in many LMICs, including Kenya (Gomez-Olive et al., 2017) as well as in populations with various medical conditions (Bachani et al., 2016; Hanass-Hancock, Myezwa, & Carpenter, 2015; Marom, Carel, Sharabi, & Ratzon, 2016). Evaluation of the WHODAS 2.0's psychometric properties across multiple LMICs has supported measurement invariance and the unidimensional property of the scale (Sousa et al., 2010). Items were ranked based on the level of difficulty due to health conditions with scores that ranged between 0 (none) and 4 (extreme or cannot do). Scoring of the scale was computed according to the 12-item instrument scoring sheet to convert the item scores to a global disability score that ranged from 0 for no disability to 100 for full disability (4–7 month range: 0–66.67; $M = 12.62$, $SD = 14.84$).

Injury severity and injury-related covariates.—Information on injury-related covariates and hospitalization was obtained from the patient's medical record of the injury

that led to his or her hospitalization. Diagnosis of injury, including anatomy and pathology of the injury, was recorded from each participant's medical record by a medical resident. Up to three injuries per patient were recorded on the baseline questionnaire. An estimated abbreviated injury scale was generated based on the anatomy and pathology of the injury. An estimated injury severity score (eISS) was calculated from the estimated abbreviated injury scale for each patient (Juillard et al., 2014). The estimated injury severity level was then categorized as minor severity (eISS range: 0–8), moderate severity (eISS range: 9–15), or severe (eISS > 15; Juillard et al., 2014). At the hospital exit interview, participants were asked if they received any type of assistance from the government or NGOs, and, if so, which type(s) of assistance they received.

Sociodemographic variables.—Sociodemographic information for all participants was obtained through the baseline hospital interview. Variables included age at admission, sex, residence (urban or rural), highest level of education attained, and marital status.

Translation of measures.—Besides the PCL-5 and HSCL-25, as described earlier, other measures were translated into Swahili by a certified translator in Kenya. The translation was then reviewed by the local data collection team and adapted upon consensus in the group discussion with the local data collection team after piloting the questionnaire. All questions were administered by the interviewer.

Data Analysis

Unconditional model.—Unconditional latent class growth models were estimated using fixed variance intercepts and fixed variance linear slope with progressing number of classes. Parameters were estimated using the full-information maximum likelihood estimator with robust standard errors. Models were estimated with cluster by data collector to account for potential similarities within the same interviewer, using complex clustering in the models. The time points modeled were the median times of follow-up: 1 month, 2.5 months, and 4.5 months postdischarge. The unconditional trajectory model was identified based on model convergence, parsimony, the Bayesian information criterion (BIC), the Vuong–Lo–Mendell–Rubin likelihood ratio test (VLMR-LRT), comparing k classes with $k-1$ class(es), the bootstrap likelihood ratio test (BLRT), and the estimated class size for stable parameter estimates. Identification of maximum likelihood solutions was confirmed for the models using 1,000 initial stage random starts and 100 final stage optimizations.

Conditional model.—Associations between the latent trajectory class membership and various PTE characteristics were assessed. These included exposure to any PTE(s), serious traumatic injury in any PTE, number of PTEs experienced, number of types of PTE experienced, and each type of PTE experienced (except for those types of trauma that were reported by less than 1% of participants).

We first assessed the bivariate association between each of these trauma characteristics and latent trajectory class membership. Bivariate association between latent trajectory class membership and other sociodemographic, injury-related covariates were also examined. The

automatic three-step approach of auxiliary variables in the mixture model was used to assess the bivariate associations (Asparouhov & Muthén, 2014a).

In the multivariate logistic regression mixture model, we included PTE characteristics as well as variables that were marginally statistically significantly associated with class membership and had been previously found to be associated with PTSD symptoms or diagnosis the literature. To estimate the direct and indirect associations between these covariates and PTSD symptom trajectory class membership, and with the distal outcome of disability at 4–7 months after hospital discharge, the sample included participants in the 4–7 month follow-up. Model fit indices, including AIC, BIC, and sample size-adjusted BIC, were compared among models with various covariates, to identify the final conditional model. Listwise deletion was used for missing covariates ($n = 34$). Covariates were included as auxiliary variables using the manual BCH methods in Mplus (Version 7.2; Asparouhov & Muthén, 2014b). All models were estimated using Mplus (Version 7.1 for Mac; Muthén & Muthén, 1998–2015).

Results

The study population included predominantly urban (93.1%), young-to-middle-aged (Mdn age = 31.4 years) male (83.4%) participants. Half of the study population had been injured from road traffic accidents (51.9%), about one-fifth from assaults (18.3%), and one-seventh from falls (14.3%). Two-fifths of the participants had a primary school education or less (39.7%), and a similar proportion had no household assets or savings (39.3%). Nearly half (48.7%) the participants reported exposure to at least one PTE. Men were more likely to report having been exposed to a PTE than women, $p < .001$. Individuals with and without exposure to PTEs were similar in their education level, occupation, intent, and cause of current injury event. The PTEs that may have been the injury event comprised small proportions of the reported PTEs (3.8% of those who experienced any PTEs). Types of PTE are described in Table 1. Among individuals who experienced a PTE, nearly half experienced more than one PTE ($Mdn = 1$, range: 1–7). About one-fifth of respondents experienced at least two types of PTEs (range: 1–4).

Unconditional PTSD Symptoms Trajectories

We tested a number of class solutions of PTSD symptoms (Table 2). Results from the model fit statistics did not concur on the same solution. The VLMR–LRT indicated a three-class solution was statistically significantly better than a two-class solution whereas the BIC and sample size-adjusted BIC had the largest decrease in a two-class solution. The BLRT indicated an increasing class was more statistically significant. A two-class solution was selected based on the decrease in BIC, and the sample size-adjusted BIC became more gradual starting from a two-class model; the three-class solution would have resulted in unstable class size as the smallest class was only estimated to include three individuals. The two classes were distinct from each other as indicated by the high entropy, which was 0.923.

The results of latent growth curve modeling found an elevated symptoms class (9.2%) and a low symptoms class (90.8%). The elevated symptoms class had a mean PCL-5 total symptoms score (intercept) of 17.62, $p < .001$, when measured 1 month after hospital

discharge versus a mean score of (intercept) 3.95, $p < .001$, for the low symptoms class. There was a very slight decrease in PTSD symptoms among the low PTSD symptoms class over time, slope = -0.19 , $p = .001$.

Covariates Associated With PTSD Trajectory Class and Level of Disability

Characteristics of PTEs.—Table 3 shows the adjusted association between various PTEs modeled separately with elevated PTSD symptoms trajectory class membership, controlling for injury-related and sociodemographic characteristics and their direct association with disability level at 4–7 months postdischarge. Having been exposed to any PTE, adjusted odds ratio (AOR) = 1.25, 95% CI [1.13, 1.37], and having experienced an additional type of PTE, AOR = 1.28, 95% CI [1.02, 1.61], were associated with membership in the elevated PTSD symptoms trajectory class. However, these associations became nonsignificant when we controlled for in-hospital depression symptoms (Table 3). Having experienced an additional PTE remained statistically significantly associated with the elevated PTSD symptoms trajectory class, AOR = 1.18, 95% CI [1.05, 1.34], but the association was reduced when we controlled for the level of depressive symptoms during hospitalization.

We found varying associations between the elevated PTSD symptoms trajectory class and types of PTEs after controlling for other covariates and their direct associations with disability level at 4–7 months postdischarge in the final conditional model (Table 4). Except for having previously witnessed killing or serious injury, AOR = 2.32, 95% CI [1.07, 5.05], other types of trauma were not statistically associated with the elevated PTSD symptoms trajectory class.

Other risk factors for the elevated PTSD symptoms trajectory.—Besides PTEs, a few other characteristics were associated with the elevated PTSD symptoms trajectory class or disability level at 4–7 months after hospital discharge. Controlling for other covariates and the association with disability at 4–7 months postdischarge, being female, AOR = 4.74, 95% CI [4.53, 4.96], and having elevated depressive symptoms during hospitalization, AOR = 2.96, 95% CI [1.28, 6.83], were more likely to be associated with membership in the elevated PTSD symptoms trajectory class. Having household financial security (with assets or savings), AOR = 0.78, 95% CI [0.70, 0.88], was associated with being less likely to be in the elevated PTSD symptoms trajectory class.

Covariates and PTSD trajectory association with disability at 4–7 months postdischarge.—Some covariates were directly associated with disability level at 4–7 months after hospital discharge. A better self-rated health status during hospitalization was associated with a lower risk of disability at this time point. Similarly, more severe injury was not associated with PTSD symptoms trajectory class but was associated with a higher level of disability at 4–7 months postdischarge, AOR = 1.28, 95% CI [1.07, 1.52]. A longer hospital stay was also associated with a higher level of disability outcome at 4–7 months postdischarge, AOR = 1.26, 95% CI [1.08, 1.47]. We found that membership in a PTSD symptoms trajectory class was associated with a statistically significantly higher level of disability at 4–7 months after hospital discharge: Individuals in the elevated PTSD

symptoms trajectory had significantly higher levels of disability than those in the low PTSD symptoms trajectory (29.10 vs. 10.90, respectively), $p < .001$.

Discussion

This study identified two trajectories of PTSD symptoms from 1 month to 4–7 months after hospital discharge from injury among this consecutive hospital sample of predominantly male urban individuals in Kenya: (a) a small class with an elevated PTSD symptoms trajectory maintained over several months after hospital discharge (9.2%) and (b) a low symptom trajectory class throughout the same period. Similar to what has been reported in the literature on PTSD symptoms after injury, the majority of injury survivors in our study had a low level of PTSD symptoms whereas the elevated PTSD symptom trajectory class was associated with a statistically significantly higher level of disability at several months after discharge (Bryant et al., 2010; O'Donnell et al., 2009, 2013). Unlike authors of other studies, we did not find additional trajectories, which was potentially due to differences in follow-up length and population. Our finding of this associated difference in disability by PTSD symptom trajectory remained after controlling for the direct associations between sociodemographic and injury characteristics, which demonstrates the predominant burden of PTSD symptoms on disability level after injury in this low-income urban setting.

Our study also found that injury survivors come into the hospital with a wide range of preinjury PTE exposure. We examined the associations between various characteristics of PTEs, depressive symptoms in the hospital, and PTSD symptom trajectory classes. Nearly half of our study population had at least one PTE and nearly one-sixth of participants were seriously injured in those events. The PTE prevalence in our study was lower than the general population prevalence of PTE that has been reported in Nigeria, South Africa, and some Western European countries (Benjet et al., 2016). Although we found that having cumulative exposure to PTEs and the number of types of PTEs experienced were associated with the elevated PTSD symptom trajectory class, these associations attenuated or became nonsignificant when we adjusted for depressive symptom severity in the hospital. As depressive symptoms and PTSD symptoms are commonly comorbid (O'Donnell, Creamer, & Pattison, 2004), controlling for depressive symptoms in the hospital may have been an overadjustment in the association between PTEs and PTSD symptom trajectory. In fact, having depressive symptoms while in the hospital may be a stronger predictor of PTSD symptom trajectory than PTEs. This corroborated the findings from studies in the United States that suggested higher postinjury distress symptoms may be associated with the development of PTSD symptoms (Zatzick et al., 2002, 2007). Early development of depression during hospitalization may be treated through psychological and behavioral interventions to prevent development of PTSD among injury survivors (Birur, Moore, & Davis, 2017).

As we examined the association between types of PTEs and PTSD symptoms trajectory after injury, we found that having witnessed a situation in which someone was seriously injured or killed increased the risk of membership in the elevated PTSD symptom trajectory class after injury. Our results aligned with findings from a previous study in South Africa as well as a multicountry survey (Atwoli et al., 2013; Kessler et al., 2014). Authors of the study

from South Africa reported that witnessing atrocities had among the highest conditional risk of PTSD out of studied PTEs whereas witnessing death or a dead body or seeing someone hurt were among the most common PTEs to which participants were exposed (Atwoli et al., 2013). Witnessing or experiencing harm to others may be associated with vivid memory formation and recall, and it may potentially subject witnesses to feelings of helplessness and the inability to act upon the trauma (Hackett, 2009). These experiences of helplessness in the event of witnessing killings and serious injuries may contribute to the pathological responses to trauma in the development of PTSD. It is also possible that such killings and serious injuries happened to loved ones and families, forming distinct experiences. As this study did not examine the thought processes during PTEs and the details of each PTE, potential mechanisms of having witnessed killings and serious injuries and later elevated PTSD symptoms warrant further research.

Consistent with the literature, individuals who were women and of a lower socioeconomic status were more likely to have elevated PTSD symptoms (Brewin et al., 2000). More specifically, we found that financial insecurity, as indicated by a lack of household savings or assets, may confer a higher risk of elevated PTSD symptoms after injury. Population-based studies from Vietnam and Cambodia found strong associations between low economic status and current posttraumatic stress as compared to those found between posttraumatic stress and PTE exposures (Jarl, Cantor-Graae, Chak, Sunbaunat, & Larsson, 2015; Pollack, Weiss, & Trung, 2016). This underlines the potentially increased vulnerability individuals without financial security face when confronted with adversity. Our current findings also indicate that mental health outcomes might not be predicted based on severity or mechanism of injury; this has also been demonstrated in other settings (Bryant et al., 2015; Zatzick et al., 2007).

This study had several strengths and limitations. Our longitudinal study included adult patients in Kenya who were admitted to the hospital due to traumatic injuries, which provided a general estimate for overall traumatic injuries in a mostly urban population in a lower middle-income country context. We also examined the direct and indirect associations between characteristics of PTEs, other risk factors, and disability at 4–7 months after hospital discharge. However, over one-third of participants who completed baseline assessments and who were more likely to be injured by assault and had a longer hospital stay could not be reached 4–7 months after discharge from the hospital. These differences may have affected the estimation of risk factors and may have biased the trajectory estimate if attrition was associated with PTSD symptoms. Next, we excluded data from 1 of the 3 data collectors due to data quality issues. This reduction in sample limited the generalizability of the data. Additionally, our study may not have had sufficient sample size to establish a stability estimate for potential additional latent class growth solution, which may be explored in a future study with a larger sample in similar contexts. We also used a different modality of assessment between baseline (in-person) and follow-up interviews (via phone). Despite the change in modality, evidence has shown good agreement between the two modalities in other populations of similar age (Evans, Kessler, Lewis, Peters, & Sharp, 2004). Another limitation was that PTEs were assessed retrospectively and may have suffered from recall bias of earlier traumatic exposure. The Brief Trauma Questionnaire was also not designed to include age at trauma exposure and did not specify PTEs prior to the

injury event and the event that led to the injury; thus, this study did not allow a separation of these PTEs to predict symptom trajectories. Limited types of PTEs were assessed in this study compared with other measures of PTEs, which may have underestimated PTE exposures and the range of PTE exposures. Details on each PTE were not assessed and we could not identify the relationship between the witness and victim in cases in which the PTE was witnessing death or injury, which may include complicating grief if the victim was a family member or close associate. Our study population also reported very few prior unwanted sexual contacts and childhood physical abuse, which may not be representative of the overall injury population. Also, this study included a largely male and urban sample, which may not generalize to females and rural residents. However, our sample was similar to the general injury population in the hospital that was reported in a previous surveillance study, and it had similar demographic characteristics compared to other public hospitals (Botchey et al., 2017). The associations between PTEs (in particular), specific types of trauma, and PTSD symptoms among female individuals after injury warrant future investigations with a larger injury survivor population.

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References

- Asparouhov T, & Muthén B (2014a). Auxiliary variables in mixture modeling: Three-step approaches using Mplus. *Structural Equation Modeling: A Multidisciplinary Journal*, 21, 329–341. 10.1080/10705511.2014.915181
- Asparouhov T, & Muthén B (2014b). Auxiliary variables in mixture modeling: Using the BCH method in Mplus to estimate a distal outcome model and an arbitrary secondary model. Available at https://www.statmodel.com/download/asparouhov_muthen_2014.pdf
- Atwoli L, Stein DJ, Williams DR, McLaughlin KA, Petukhova M, Kessler RC, & Koenen KC (2013). Trauma and posttraumatic stress disorder in South Africa: Analysis from the South African Stress and Health Study. *BMC Psychiatry*, 13 10.1186/1471-244x-13-182
- Bachani AM, Galiwango E, Kadobera D, Bentley JA, Bishai D, Wegener S, . . . Hyder AA (2016). Characterizing disability at the Iganga-Mayuge Demographic Surveillance System (IM-DSS), Uganda. *Disability and Rehabilitation*, 38, 1291–1299. 10.3109/09638288.2015.1079928 [PubMed: 26457663]
- Bachani AM, Koradia P, Herbert HK, Mogere S, Akungah D, Nyamari J, . . . Stevens KA (2012). Road traffic injuries in Kenya: the health burden and risk factors in two districts. *Traffic Injury Prevention*, 13(Suppl 1), 24–30. 10.1080/15389588.2011.633136
- Benjet C, Bromet E, Karam EG, Kessler RC, McLaughlin KA, Ruscio AM, . . . Koenen KC (2016). The epidemiology of traumatic event exposure worldwide: Results from the World Mental Health Survey Consortium. *Psychological Medicine*, 46, 327–343. 10.1017/S0033291715001981 [PubMed: 26511595]
- Birur B, Moore NC, & Davis LL (2017). An evidence-based review of early intervention and prevention of posttraumatic stress disorder. *Community Mental Health Journal*, 53, 183–201. 10.1007/s10597-016-0047-x [PubMed: 27470261]

- Blevins CA, Weathers FW, Davis MT, Witte TK, & Domino JL (2015). The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): Development and initial psychometric evaluation. *Journal of Traumatic Stress*, 28, 489–498. doi: 10.1002/jts.22059 [PubMed: 26606250]
- Botchey IM, Jr., Hung YW, Bachani AM, Paruk F, Mehmood A, Saidi H, & Hyder AA (2017). Epidemiology and outcomes of injuries in Kenya: A multisite surveillance study. *Surgery*, 162(6s), S45–S53. 10.1016/j.surg.2017.01.030 [PubMed: 28385178]
- Brewin CR, Andrews B, & Valentine JD (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology*, 68, 748–766. 10.1037//0022-006x.68.5.748 [PubMed: 11068961]
- Bryant RA, Nickerson A, Creamer M, O'Donnell M, Forbes D, Galatzer-Levy I, . . . Silove D (2015). Trajectory of post-traumatic stress following traumatic injury: 6-year follow-up. *The British Journal of Psychiatry*, 206, 417–423. 10.1192/bjp.bp.114.145516 [PubMed: 25657356]
- Bryant RA, O'Donnell ML, Creamer M, McFarlane AC, Clark CR, & Silove D (2010). The psychiatric sequelae of traumatic injury. *The American Journal of Psychiatry*, 167, 312–320. 10.1176/appi.ajp.2009.09050617 [PubMed: 20048022]
- Derogatis LR, Lipman RS, Rickels K, Uhlenhuth EH, & Covi L (1974). The Hopkins Symptom Checklist (HSCL): A self-report symptom inventory. *Behavioral science*, 19(1), 1–15. [PubMed: 4808738]
- Evans M, Kessler D, Lewis G, Peters TJ, & Sharp D (2004). Assessing mental health in primary care research using standardized scales: can it be carried out over the telephone?. *Psychological Medicine*, 34(1), 157–162. [PubMed: 14971636]
- Gomez-Olive FX, Schröders J, Aboderin I, Byass P, Chatterji S, Davies JI, . . . Witham MD (2017). Variations in disability and quality of life with age and sex between eight lower income and middle-income countries: Data from the INDEPTH WHO-SAGE collaboration. *BMJ Global Health*, 2, e000508 10.1136/bmjgh-2017-000508
- Haagsma JA, Graetz N, Bolliger I, Naghavi M, Higashi H, Mullany EC, . . . Vos T (2016). The global burden of injury: incidence, mortality, disability-adjusted life years and time trends from the Global Burden of Disease study 2013. *Injury Prevention*, 22, 3–18. 10.1136/injuryprev-2015-041616 [PubMed: 26635210]
- Hackett M (2009). Commentary: Trauma and female inmates: Why is witnessing more traumatic? *Journal of the American Academy of Psychiatry and the Law*, 37, 310–315. [PubMed: 19767495]
- Hanass-Hancock J, Myezwa H, & Carpenter B (2015). Disability and living with HIV: Baseline from a cohort of people on long-term ART in South Africa. *PLoS One*, 10, e0143936 10.1371/journal.pone.0143936 [PubMed: 26625001]
- Harder VS, Mutiso VN, Khasakhala LI, Burke HM, & Ndeti DM (2012). Multiple traumas, postelection violence, and posttraumatic stress among impoverished Kenyan youth. *Journal of Traumatic Stress*, 25, 64–70. 10.1002/jts.21660 [PubMed: 22354509]
- Haroz EE, Bolton P, Gross A, Chan KS, Michalopoulos L, & Bass J (2016). Depression symptoms across cultures: An IRT analysis of standard depression symptoms using data from eight countries. *Social Psychiatry and Psychiatric Epidemiology*, 51, 981–991. 10.1007/s00127-016-1218-3 [PubMed: 27083900]
- Herbert HK, Hyder AA, Butchart A, & Norton R (2011). Global health: Injuries and violence. *Infectious Disease Clinics of North America*, 25, 653–668, x. 10.1016/j.idc.2011.06.004 [PubMed: 21896365]
- Heron-Delaney M, Kenardy J, Charlton E, & Matsuoka Y (2013). A systematic review of predictors of posttraumatic stress disorder (PTSD) for adult road traffic crash survivors. *Injury*, 44, 1413–1422. 10.1016/j.injury.2013.07.011 [PubMed: 23916902]
- Hinton DE, & Lewis-Fernandez R (2011). The cross-cultural validity of posttraumatic stress disorder: Implications for DSM-5. *Depression and Anxiety*, 28, 783–801. 10.1002/da.20753 [PubMed: 21910185]
- Institute for Health Metrics and Evaluation. (2016). GBD compare. Retrieved from <http://vizhub.healthdata.org/gbd-compare/>

- Irish L, Ostrowski SA, Fallon W, Spoonster E, van Dulmen M, Sledjeski EM, & Delahanty DL (2008). Trauma history characteristics and subsequent PTSD symptoms in motor vehicle accident victims. *Journal of Traumatic Stress*, 21, 377–384. 10.1002/jts.20346 [PubMed: 18720390]
- Jarl J, Cantor-Graae E, Chak T, Sunbaunat K, & Larsson CA (2015). Trauma and poor mental health in relation to economic status: The case of Cambodia 35 years later. *PLoS One*, 10, e0136410 10.1371/journal.pone.0136410 [PubMed: 26301591]
- Jenkins R, Othieno C, Omollo R, Ongeru L, Sifuna P, Mboroki JK, . . . Ogotu B (2015). Probable posttraumatic stress disorder in Kenya and its associated risk factors: A cross-sectional household survey. *International Journal of Environmental Research and Public Health*, 12, 13494–13509. 10.3390/ijerph121013494 [PubMed: 26516877]
- Juillard CJ, Stevens KA, Monono ME, Mballa GA, Ngamby MK, McGreevy J, . . . Hyder AA (2014). Analysis of prospective trauma registry data in Francophone Africa: A pilot study from Cameroon. *World Journal of Surgery*, 38, 2534–2542. 10.1007/s00268-014-2604-1 [PubMed: 24791906]
- Kaaya SF, Fawzi MC, Mbwambo JK, Lee B, Msamanga GI, & Fawzi W (2002). Validity of the Hopkins Symptom Checklist-25 amongst HIV-positive pregnant women in Tanzania. *Acta Psychiatrica Scandinavica*, 106, 9–19. 10.1034/j.1600-0447.2002.01205.x [PubMed: 12100343]
- Kessler RC, Rose S, Koenen KC, Karam EG, Stang PE, Stein DJ, . . . Carmen Viana M (2014). How well can post-traumatic stress disorder be predicted from pre-trauma risk factors? An exploratory study in the WHO World Mental Health Surveys. *World Psychiatry*, 13, 265–274. 10.1002/wps.20150 [PubMed: 25273300]
- Kubzansky LD, Bordelois P, Jun HJ, Roberts AL, Cerda M, Bluestone N, & Koenen KC (2014). The weight of traumatic stress: a prospective study of posttraumatic stress disorder symptoms and weight status in women. *JAMA Psychiatry*, 71, 44–51. 10.1001/jamapsychiatry.2013.2798 [PubMed: 24258147]
- Lee B, Kaaya SF, Mbwambo JK, Smith-Fawzi MC, & Leshabari MT (2008). Detecting depressive disorder with the Hopkins Symptom Checklist-25 in Tanzania. *International Journal of Social Psychiatry*, 54, 7–20. 10.1177/0020764006074995 [PubMed: 18309755]
- Li H, Wang L, Shi Z, Zhang Y, Wu K, & Liu P (2010). Diagnostic utility of the PTSD Checklist in detecting PTSD in Chinese earthquake victims. *Psychological Reports*, 107, 733–739. 10.2466/03.15.20.PR0.107.6.733-739 [PubMed: 21323132]
- Lundberg P, Cantor-Graae E, Rukundo G, Ashaba S, & Ostergren PO (2009). Urbanicity of place of birth and symptoms of psychosis, depression and anxiety in Uganda. *British Journal of Psychiatry*, 195, 156–162. 10.1192/bjp.bp.108.051953 [PubMed: 19648549]
- Marom BS, Carel RS, Sharabi M, & Ratzon NZ (2016). Cross-cultural adaptation of the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0) for Hebrew-speaking subjects with and without hand injury. *Disability and Rehabilitation*, 39, 1155–1161. 10.1080/09638288.2016.1189606 [PubMed: 27291062]
- Muthén LK, & Muthén BO (1998–2015). *Mplus user's guide* (7th Edition). Los Angeles, CA: Muthén & Muthén.
- O'Donnell ML, Alkemade N, Creamer MC, McFarlane AC, Silove D, Bryant RA, & Forbes D (2016). The long-term psychiatric sequelae of severe injury: A 6-year follow-up study. *Journal of Clinical Psychiatry*, 77, e473–479. 10.4088/JCP.14m09721 [PubMed: 27137435]
- O'Donnell ML, Creamer M, & Pattison P (2004). Posttraumatic stress disorder and depression following trauma: Understanding comorbidity. *The American Journal of Psychiatry*, 161, 1390–1396. [PubMed: 15285964]
- O'Donnell ML, Holmes AC, Creamer MC, Ellen S, Judson R, McFarlane AC, . . . Bryant RA (2009). The role of post-traumatic stress disorder and depression in predicting disability after injury. *The Medical Journal of Australia*, 190, S71–74. [PubMed: 19351297]
- O'Donnell ML, Varker T, Holmes AC, Ellen S, Wade D, Creamer M, . . . Forbes D (2013). Disability after injury: The cumulative burden of physical and mental health. *Journal of Clinical Psychiatry*, 74, e137–e143. 10.4088/JCP.12m08011 [PubMed: 23473359]
- Ongecha-Owuor FA, Kathuku DM, Othieno CJ, & Ndeti DM (2004). Post traumatic stress disorder among motor vehicle accident survivors attending the orthopaedic and trauma clinic at Kenyatta National Hospital, Nairobi. *East African Medical Journal*, 81, 362–366. [PubMed: 15490709]

- Ozer EJ, Best SR, Lipsey TL, & Weiss DS (2003). Predictors of posttraumatic stress disorder and symptoms in adults: a meta-analysis. *Psychological Bulletin*, 129, 52–73. [PubMed: 12555794]
- Pollack AA, Weiss B, & Trung LT (2016). Mental health, life functioning, and risk factors among people exposed to frequent natural disasters and chronic poverty in Vietnam. *BJPsych Open*, 2, 221–232. 10.1192/bjpo.bp.115.002170 [PubMed: 27458524]
- Schnurr PP, Spiro A, Vielhauer MJ, Findler MN, & Hamblen JL (2002). Trauma in the lives of older men: Findings from the Normative Aging Study. *Journal of Clinical Geropsychology*, 8(3), 175–187. 10.1023/A:1015992110544
- Sousa RM, Dewey ME, Acosta D, Jotheeswaran AT, Castro-Costa E, Ferri CP, . . . Prince MJ (2010). Measuring disability across cultures: The psychometric properties of the WHODAS II in older people from seven low- and middle-income countries. The 10/66 Dementia Research Group population-based survey. *International Journal of Methods in Psychiatric Research*, 19, 1–17. 10.1002/mpr.299
- Tsutsumi A, Izutsu T, Poudyal AK, Kato S, & Marui E (2008). Mental health of female survivors of human trafficking in Nepal. *Social Science & Medicine*, 66, 1841–1847. 10.1016/j.socscimed.2007.12.025 [PubMed: 18276050]
- Üstün TB, Kostanjsek N, Chatterji S, & Rehm J (Eds.). (2010). *Measuring health and disability: Manual for WHO disability assessment schedule WHODAS 2.0*. World Health Organization.
- Wiseman T, Foster K, & Curtis K (2013). Mental health following traumatic physical injury: An integrative literature review. *Injury*, 44, 1383–1390. 10.1016/j.injury.2012.02.015 [PubMed: 22409991]
- Zatzick DF, Kang SM, Muller HG, Russo JE, Rivara FP, Katon W, . . . Roy-Byrne P (2002). Predicting posttraumatic distress in hospitalized trauma survivors with acute injuries. *American Journal of Psychiatry*, 159, 941–946. 10.1176/appi.ajp.159.6.941 [PubMed: 12042181]
- Zatzick DF, Rivara FP, Nathens AB, Jurkovich GJ, Wang J, Fan MY, . . . Mackenzie EJ (2007). A nationwide US study of post-traumatic stress after hospitalization for physical injury. *Psychological Medicine*, 37, 1469–1480. 10.1017/s0033291707000943 [PubMed: 17559704]
- Zhang G, North CS, Narayanan P, Kim YS, Thielman S, & Pfefferbaum B (2013). The course of postdisaster psychiatric disorders in directly exposed civilians after the US Embassy bombing in Nairobi, Kenya: a follow-up study. *Social Psychiatry and Psychiatric Epidemiology*, 48, 195–203. 10.1007/s00127-012-0535-4 [PubMed: 22717596]

Figure 1.
Flowchart of participant recruitment and attrition in the study.

Table 1

Types of Potentially Traumatic Events (PTEs) Assessed and Percentage of Participants Who Reported Having Experienced Them at Baseline, Using Brief Trauma Questionnaire

Potentially Traumatic Event	<i>n</i>	%
Served in a war zone or a noncombat job that exposed the person to war-related casualties	14	2.9
Serious car accident or a serious accident at work or somewhere else	75	15.8
In a major natural or technological disaster	7	1.5
Had a life-threatening illness, such as cancer, a heart attack, leukemia, AIDS, multiple sclerosis, etc.	4	0.8
Physically punished or beaten by a caretaker before age 18; he/she was very frightened, thought he/she would be injured/was injured	3	0.6
Attacked, beaten, or mugged by anyone, including friends, family members, or strangers	83	17.4
In other situation the respondent was (or feared he/she might be) seriously injured or killed	1	0.2
Someone made or pressured respondent into having some type of unwanted sexual contact	2	0.4
A close family member or friend in violent death	92	19.3
Witnessed a situation in which someone was (or feared someone would be) seriously injured or killed	91	19.1

Note. *N* = 476. Individuals may have endorsed more than one PTE.

Fit Information for Latent Growth Curve Model of Posttraumatic Stress Disorder (PTSD) Symptoms Between 1 and 4–7 Months After Hospital Discharge with One to Four Latent Classes

Table 2

Number of classes	df	LL	AIC	BIC	Sample-size adjusted BIC	VLMR LRT		BLRT	Entropy	Smallest class n (%)	
						2*LL	p			n	%
1	5	3,569.41	7,148.83	7,169.65	7,153.78		N/A	N/A	N/A	N/A	
2	8	3,428.78	6,873.57	6,906.89	6,881.50	281.259	.869	<.001	0.923	44	9.2
3	11	3,370.55	6,763.09	6,808.91	6,774.00	124.546	<.001	<.001	0.932	3	0.6
4	14	3,308.35	6,644.70	6,703.02	6,658.58	116.319	.313	<.001	0.923	3	0.6

Note. $N = 476$. df = degrees of freedom; LL = log-likelihood; AIC = Akaike information criterion; BIC = Bayesian information criterion; VLMR LRT = Vuong–Lo–Mendell–Rubin likelihood ratio test; BLRT = bootstrap likelihood ratio test.

Adjusted Odds Ratios (AOR) from Multivariate Logistic Regressions of Latent Growth Curve Membership on Potentially Traumatic Event (PTE) Characteristics^a

Table 3

Trauma characteristics (each modeled separately)	Elevated PTSD Symptoms Class			
	Controlled for Depressive Symptoms in Hospital		Not Controlled for Depressive Symptoms in Hospital	
	aOR	95% CI	aOR	95% CI
Exposure to any PTE (binary indicator)	1.15	[0.95, 1.38]	1.25***	[1.13, 1.37]
Serious traumatic injury in any PTE (binary indicator)	0.70	[0.08, 6.03]	0.67	[0.07, 6.05]
Number of PTEs experienced	1.18**	[1.05, 1.34]	1.23***	[1.22, 1.23]
Number of types of PTE experienced	1.24	[0.87, 1.77]	1.28*	[1.02, 1.61]

Note. N = 369. PTSD = posttraumatic stress disorder.

^aControlling for direct association with disability (with low symptoms trajectory as reference). Each model was controlled for sex, age (increment of 10 years), estimated Injury Severity Score (mild, moderate, severe), self-rated health status during hospitalization, road traffic injuries (vs. others), duration of hospitalization (increment of half a month), and household financial security (having savings or assets vs. none).

* $p < .05$

** $p < .01$

*** $p < .001$.

Adjusted Odds Ratios (AORs) from Multivariate Logistic Regressions of Latent Growth Curve Membership and Disability at 4–7 Months Postdischarge on Risk Factors and Type of Potentially Traumatic Events (PTEs) Reported at Baseline

Table 4

Variable	Elevated PTSD Symptoms Trajectory ^a		Disability at 4–7 Months	
	aOR	95% CI	aOR	95% CI
Demographic characteristics				
Women (vs. men)	4.74 ^{***}	[4.53, 4.96]	1.46	[0.84, 2.54]
Age (increment increase of 10 years)	0.68	[0.42, 1.82]	1.19 ^{***}	[1.11, 1.28]
Self-perceived health status				
Self-rated health status during hospitalization (increment 10 units of better health; range: 0–100)	1.05	[0.85, 1.29]	0.88 ^{***}	[0.87, 0.88]
Depressive symptoms severity during hospitalization				
Elevated depressive symptoms during hospitalization (HSCL-25 Depressive subscale 1.75 vs. lower)	2.96 [*]	[1.28, 6.83]	1.00	[0.63, 1.57]
Injury characteristics				
Road traffic injuries (vs. others)	1.00	[0.95, 1.06]	1.41	[0.98, 2.03]
Estimated injury severity level (increment increase, eISS < 9, 9–15, >15)	0.77	[0.34, 1.73]	1.28 ^{**}	[1.07, 1.52]
Duration of hospital stay (increment increase of 2 weeks)	1.25	[0.81, 1.92]	1.26 ^{**}	[1.08, 1.47]
Household financial security				
Household savings or assets (vs. none)	0.78 ^{***}	[0.70, 0.88]	1.05	[0.78, 1.42]
Types of PTEs				
Experienced war (vs. none)	1.75	[0.18, 17.45]	0.78	[0.36, 1.71]
Serious/life-threatening unintentional injury (vs. none)	1.54	[0.91, 2.60]	1.21	[0.86, 1.70]
Got seriously injured/life-threatening physical attack (vs. none)	0.94	[0.82, 1.08]	0.94	[0.67, 1.34]
Witnessed killing or fear life threatened (vs. none)	2.32 [*]	[1.07, 5.05]	1.13	[0.56, 2.29]
Close family or friend died violently (vs. none)	0.50	[0.20, 1.22]	1.11 ^{***}	[1.08, 1.13]

Note. $N = 369$. HSCL-25 = Hopkins Symptoms Checklist.

^a $M = 17.62$ vs. $M = 3.95$ in low symptoms class.

ISS = estimated Injury Severity Score.

$p < .001$

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

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