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# The diagnostic utility of the PCL-5 in a traumatically injured black population

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ABSTRACT

*Background:* Posttraumatic stress disorder (PTSD) is common after traumatic injury, negatively impacting recovery. Black Americans face elevated PTSD risk following traumatic injury, yet diagnostic accuracy of assessments in trauma center settings serving this population is unknown. The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5) exhibits strong psychometric properties but optimal cut-scores by race require examination.
*Methods:* Data were combined from three ongoing projects of injured Black American adults (N = 270). Participants completed the PCL-5 and Clinician-Administered PTSD Scale for DSM-5 (CAPS-5) six months post-injury. Receiver operating characteristic analysis determined the PCL-5's diagnostic utility against the CAPS-5. Sensitivity, specificity, predictive values, and diagnostic efficiency were calculated across cut scores.
*Results:* Prevalence of CAPS-5 PTSD at 6-months post-injury was 34.4 %. The PCL-5 demonstrated good accuracy in detecting PTSD (AUC=.931). A PCL-5 cut-score of > 33 maximized diagnostic efficiency (89.1 %), with sensitivity of 89.1 % and specificity of 87.6 %.
*Conclusions:* The PCL-5 is an accurate PTSD screening tool for injured Black Americans using an appropriate threshold. Findings have implications for improving mental health care access in trauma settings serving marginalized groups.

## 1. Introduction

Although traumatic injury remains the leading cause of death in the United States (U.S.), innovations in trauma systems have significantly increased survival rates, bringing quality of life considerations for survivors to the forefront of research and clinical practice (Nathens et al., 2004; Glance et al., 2012; DiMaggio et al., 2016). Importantly, studies indicate physical well-being, employment status, and overall satisfaction with recovery after traumatic injury largely depend on mental health outcomes subsequent to traumatic injury; this relationship persists even when adjusting for injury severity and physical recovery status (Michaels et al., 2000).

Relatedly, studies have found individuals experiencing traumatic injury face elevated risk of developing various mental health disorders compared to the general population, including posttraumatic stress disorder (PTSD) (O'Donnell et al., 2010). PTSD prevalence estimates six months after injury vary between 18 % and 42 % (Bryant and Harvey, 1998; Ehlers et al., 1998; Frommberger et al., 1998; Michaels et al., 1999; Ursano et al., 1999) with the variance attributed to methodological factors, such as assessment approaches (e.g., self-report versus structured clinical interview) and specific hospital and injury details [e.g., catchment area, mechanism of injury (MOI)] (O'Donnell et al., 2003). Among those experiencing traumatic injury, PTSD emerges as a significant factor influencing post-injury quality of life and recovery, especially when compared to individuals who undergo physical trauma without subsequent PTSD (Kiely et al., 2006). Additionally, there is evidence demonstrating a more persistent presentation is likely when PTSD symptoms endure beyond three to six months following trauma (Kessler et al., 1995), emphasizing the need for reliable diagnostic measurement, particularly within this timeframe.

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These considerations collectively underscore the harmful impact of PTSD and emphasize the subsequent necessity for effective, efficient identification of the disorder in populations affected by traumatic injuries. In line with this, the American College of Surgeon's Committee on Trauma now requires Level I and II trauma centers to have a protocol for screening patients at elevated risk for psychological sequelae of trauma and refer them to mental health services (Surgeons, 2022). Although the Clinician Administered PTSD Scale for DSM-5 (CAPS-5) is the gold standard for diagnosing and measuring PTSD (Hunt et al., 2018a; Weathers et al., 2018), administration is time-consuming and necessitates a trained professional; in fact, providers unable to assess PTSD frequently cite time restrictions as the primary impediment in evaluating emotional functioning following traumatic injury (Agtarap et al., 2018). Consequently, researchers and clinicians often turn to concise self-report questionnaires to identify individuals who may benefit from psychological intervention.

The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5) is one of the few validated measures of PTSD severity aligned with the DSM-5 exhibiting excellent psychometric properties (Price and van Stolk-Cooke, 2015). Initial research has suggested PCL-5 cut-scores ranging from 31 to 33 for indicating likely PTSD (Weathers et al., 2013), with a cut-score of 30 specifically recommended for traumatic injury populations (Geier et al., 2019). Although this cut score was established using a traumatic injury sample, the majority of the analytic sample (i.e., 50.2 %) identified as non-Hispanic White; optimal thresholds differ by groups depending on other factors, such as demographic characteristics (e.g., race/ethnicity), trauma type (e.g., intentional violence), and psychosocial history (Blanchard et al., 1996; Irish et al., 2011; Van Zelst and Beekman, 2012).

Critically, Black individuals in the U.S. (i.e., Black Americans) exhibit a higher likelihood of experiencing traumatic injury (Cubbin et al., 2000) along with subsequent poorer functional outcomes (Arango-Lasprilla et al., 2007; Staudenmayer et al., 2007; Glance et al., 2013). In line with this, Black Americans are not only at greater risk of developing PTSD generally, but they also exhibit PTSD with greater severity and chronicity when compared to non-Hispanic White counterparts (Alegría et al., 2013; Sibrava et al., 2019). Although Black Americans exhibit higher lifetime prevalence of PTSD compared to non-Hispanic White Americans, the relationship between race and PTSD is complex. Prior epidemiological research demonstrates patterns of trauma exposure vary significantly by event type, where Black Americans report higher exposure to assaultive violence and child maltreatment but lower exposure to accidents and unexpected death of loved ones (Roberts et al., 2011). Further, Black Americans face elevated risk for chronic trauma and adversity beyond DSM-defined traumatic events, including racial discrimination, community violence exposure, and other environmental inequities that impact health (Williams and Collins, 2001; Sheats et al., 2018). These disparities have been linked to increased rates and severity of PTSD symptoms in Black populations (Williams et al., 2018a; Bird et al., 2021), underscoring the need to support the development of more tailored and effective PTSD screening practices in this disproportionately affected population.

Despite these findings, no studies have examined the diagnostic utility of PCL-5 cut scores compared to CAPS-5 in Black American trauma survivors. As Williams and colleagues discuss, assessment tools must account for the unique effects of race when evaluating PTSD in Black Americans (Williams et al., 2021, 2018b). To this point, Ruglass and colleagues found measurement nonequivalence across racial/ethnic groups when examining the CAPS (Ruglass et al., 2020); for example, compared to non-Hispanic White women, Black and Latina women showed differences in the relevance and threshold levels of certain avoidance, emotional numbing, and hyperarousal symptoms. This suggests potential variation in how PTSD symptoms manifest and impact functioning across racial/ethnic groups. One explanation proposed by Ruglass for differences observed is that Black Americans experience heightened baseline severity of certain symptoms (e.g., hypervigilance), independent of their trauma exposure history, stemming from chronic experiences of discrimination. With an already elevated symptom baseline, there may be a ceiling effect wherein any trauma-related exacerbations of hypervigilance or other symptoms have a relatively minimal incremental influence. Consequently, these particular symptoms may be less diagnostically meaningful for indicating PTSD in Black populations compared to less marginalized groups that endorse lower premorbid levels (Ruglass et al., 2020). Evaluating PCL-5 cut scores in Black traumatic injury survivors specifically is important for determining an optimal threshold that accurately detects PTSD cases.

To this end, the purpose of the current study is to evaluate the diagnostic utility of the PCL-5 for detecting PTSD in Black American injury survivors 6 months out after injury, using the CAPS-5 as the gold standard. As intentional, interpersonal traumatic injury (e.g., gunshot wounds) confers heightened risk for posttraumatic psychopathology compared to accidental or unintentional injury (e.g., crashes) (Alarcon et al., 2012; Chiu et al., 2011; Ozer et al., 2003; Zatzick et al., 2007), 6-month PCL-5 cut scores were examined for the overall sample as well as stratified by intentionality of MOI. Investigating the scale's diagnostic utility by injury mechanism will help refine PTSD case identification among high-risk trauma subgroups. It was hypothesized the optimal PCL-5 cut score would be higher for Black American injury survivors than the previously established cut score of 30 in a general traumatic injury population (Geier et al., 2019). Given the focus of the current study on Black Americans, a population known to face elevated risk for developing PTSD (Alegría et al., 2013; Sibrava et al., 2019), this hypothesis aligns with extant literature noting higher-risk groups (e.g., Veterans) in general often require higher symptom thresholds (Bovin et al., 2016). Further, in line with previous findings (Geier et al., 2019), it was expected that the optimal cut score would differ by MOI, with those experiencing intentional traumatic injury (e.g., gunshot wound) requiring a higher threshold compared to unintentional injuries (e.g., motor vehicle crash). Altogether, determining optimal PCL-5 cut scores for this population will support implementation of routine PTSD screening in trauma centers that serve Black American patients, facilitating more effective recognition and treatment of PTSD to improve outcomes in this critical population.

## 2. Materials and methods

### 2.1. Participants and procedures

Data were combined from three independent research projects prospectively measuring psychological and biological outcomes after traumatic injury at a single Midwest level 1 trauma center. Inclusion criteria: 1.) 18 + years; 2.) Glasgow Coma Scale > 13; 3.) no moderate/severe traumatic brain injury; and 4.) non-self-inflicted injury. PCL-5 and CAPS-5 were administered 6-months after injury. Study procedures were approved by the relevant institutional review board. Methodological details, including study designs, have been described elsewhere in full, including Study 1 (Hunt et al., 2018b), Study 2 (Geier et al., 2023), and Study 3 (Bird et al., 2021; Weis et al., 2022). Of note, Studies 1 and 2 had a baseline assessment completed while the participants were hospitalized related to traumatic injury (Study 1 mean days since injury = 2.86, SD = 2.34; Study 2 mean days since injury = 3.89, SD = 3.24), whereas Study 3 completed the baseline assessment after discharge from the Emergency Department approximately 2 weeks after injury (Study 3 mean days since injury = 16.24, SD = 5.81). Given the focus of the current study, only participants who identified as Black or African American were included in analyses. A total of 414 participants met inclusion criteria and completed baseline hospitalization protocols. Retention between baseline assessment and six-month follow-up was 65.22 %, yielding a final analytic sample of 270. The CAPS-5 was administered by graduate- and postdoctoral-level mental health professionals an average of 6.4 months after injury date (i.e., M = 191.06 days; SD = 21.14; Range = 158–336).

Demographics for the final analytic sample (N = 270) are as follows: age *M* = 34.89 (SD = 12.39) and 57.78 % (n = 156) male. Regarding education, 8.15 % (n = 22) of the sample had at least a college degree, with another 58.52 % (n = 158) of the sample obtaining a high school degree. Further, 58.89 % (n = 159) of the sample reported current employment. population. Regarding injury characteristics, approximately 33.33 % (n = 93) of the sample had a MOI considered intentional (i.e., gunshot, stabbing, blunt assault). The mean Injury Severity Score (ISS), an objective score estimating the severity of injuries (Baker et al., 1974), was 7.17 (SD = 8.63; range = 0–43), indicating generally moderate severity of injury for the sample. Approximately 18.52 % (n = 50) endorsed a history of formal psychiatric diagnosis. Regarding symptoms of PTSD, the CAPS-5 *M* = 17.23 (SD = 14.87), and the PCL-5 *M* = 27.97 (SD = 22.08).

### 2.2. Measures

*Demographic and Injury Information*. At baseline, participants provided demographic information, including age, gender, race / ethnicity, education, employment, and psychiatric diagnosis history. ISS as well as MOI (i.e., intentional versus unintentional) were documented from the electronic medical record.

*PTSD Checklist for DSM-5 (PCL-5)*. The PCL-5 is a 20-item self-report measure assessing the 20 DSM-5 symptoms of PTSD (Weathers et al., 2013). Each response is rated on a scale of 0–4, with 0 indicating no experience of a PTSD symptom and 4 indicating the severest experience of that symptom. A total symptom severity score (range: 0–80) is obtained by summing the scores of all items. A provisional PTSD diagnosis can also be made by treating each item rated as 2 or higher as a symptom endorsed, then following the DSM-5 diagnostic rule which requires at least: 1 B item (items 1–5), 1 C item (items 6–7), 2 D items (items 8–14), and 2 E items (items 15–20). The PCL-5 has been found to exhibit strong reliability and validity in psychometric evaluation (Blevins et al., 2015). The internal consistency of the PCL-5 was 0.96 for the total score (excellent), 0.93 for criterion B items (excellent), 0.89 for criterion C items (good), 0.89 for criterion D items (good), and 0.84 for criterion E items (good).

*Clinician-Administered PTSD Scale for DSM-5 (CAPS-5)*. The CAPS-5 is a 30-item structured interview mirroring the DSM-5 PTSD factor structure. It is the gold standard for PTSD diagnosis, with questions targeting symptom onset and duration as well as subjective distress and impact on functioning. Psychometric investigations suggest CAPS-5 is a psychometrically sound measure of DSM–5 PTSD (Weathers et al., 2018). The CAPS-5 was administered and scored by trained graduate and postdoctoral-level professionals, with an inter-rater reliability kappa of 1.00 at the level of diagnosis in a subsample of approximately 10 % of the interviews.

### 2.3. Statistical analysis

Descriptive statistics were computed, utilizing proportions for categorical variables and means and standard deviations for continuous variables. As the retention rate between baseline and six-month follow-up was 65.22 %, difference testing was completed to identify significant differences between completers and non-completers. Further, as data were combined from three separate projects, difference testing was also completed to identify significant differences between projects. Specifically, chi-square test of independence was utilized for categorical variables, likelihood ratio test was utilized for nominal variables, Mann-Whitney *U* test for skewed variables when comparing the analytic sample to the sample lost to follow-up, as well as Kruskal-Wallis test for skewed variables when comparing key differences between the three studies making up the analytic sample.

Means and standard deviations were calculated for individual PTSD symptoms and criteria as well as overall total symptom score by measure. Pearson correlations between measures were also determined. Internal consistency as measured by Cronbach's α was calculated for PCL-5 total score as well as criterion items.

Logistic regression was conducted to measure the degree to which CAPS-5-based PTSD diagnoses were predicted from the PCL-5 symptom score; corresponding classification rates were detailed. Receiver Operating Characteristic (ROC) curve analyses were completed to provide an effect size measure of the diagnostic accuracy of the PCL-5 (i.e., area under the ROC curve, AUC) as well as to identify the optimal cut-score for the PCL-5, obtained via the Youden's *J* index generated by the ROC curve analysis. As different clinical and research work may benefit from optimizing either sensitivity or specificity, a table of values was computed to detail the sensitivity, specificity, positive predictive values (PPV), negative predictive values (NPV), and overall diagnostic efficiency (i.e., proportion of patients correctly diagnosed) for each cut score on the PCL-5, using the CAPS-5 diagnosis as the gold standard. ROC curve analysis was completed for both the whole analytic sample as well as by MOI (i.e., intentional v. unintentional). To calculate the NPV and PPV at 6-month follow-up, 20.7 % was utilized as the estimated disease prevalence rate of PTSD for ROC curve analysis. Examining a nationally representative dataset, Zatzick and colleagues reported approximately 20.7 % of patients experiencing traumatic injury meet criteria for PTSD 12 months post-injury (Zatzick et al., 2008); there was no epidemiological rate reported for six months post-injury. As rates of PTSD generally decrease over time from initial date of injury, a six-month 20.7 % disease rate estimate based on 12-month data is a conservative approach in approximating prevalence. Further, use of the gold standard assessment for PTSD (i.e., CAPS-5) should reduce error in posterior estimates.

## 3. Results

The analytic sample (N = 270) did not significantly differ from the sample lost to follow-up (N = 144) by age ($U = 280193.50$, $p = 0.11$), baseline PCL-5 (U = 30812.50, $p = 0.39$), or psychiatric history [$\chi^2$ (1) = 1.92, $p = 0.17$]. That said, ISS was significantly different across groups (U = 28991.00, $p < 0.001$), where individuals in the final analytic sample had significantly lower ISS (*M* ISS = 7.17; SD = 8.63) compared to non-completers (*M* ISS = 9.29; SD 5.85). Further, men were less likely to follow up (59.54 %) compared to women (75 %); $\chi^2$ (1) = 10.13, $p = 0.002$. Those experiencing interpersonal mechanisms of injury were also less likely to follow up (51.72 %) compared to those without that type of injury (75 %); $\chi^2$ (1) = 24.09, p < 0.001. Further, those employed at baseline were more likely to follow up (n = 159, 70.04 %) compared to those unemployed at baseline (n = 111, 59.36 %); $\chi^2$ (1) = 5.16, $p = 0.02$. Those with at least a high school degree were more likely to follow up (n = 222, 68.94 %) compared to those without at least a high

**Table 1**
Key variable descriptive statistics, by Study.

| | Study 1 N = 103 Mean (SD) | Study 2 N = 55 Mean (SD) | Study 3 N = 112 Mean (SD) | p |
|---|---|---|---|---|
| Age | 33.59 (12.69) | 36.44 (14.44) | 34.09 (11.03) | 0.99 |
| ISS | 10.31 (6.21) | 13.98 (9.78) | 0.75 (1.76) | < 0.001 |
| PCL−5 (Baseline) | 25.79 (18.12) | 26.08 (20.55) | 26.67 (18.24) | 0.66 |
| PCL−5 (6-month) | 32.45 (20.90) | 32.27 (25.70) | 22.27 (19.82) | < 0.001 |
| CAPS−5 (6-month) | 21.01 (15.35) | 19.05 (16.41) | 12.86 (12.41) | < 0.001 |
| | n (%) | n (%) | n (%) | |
| Male | 72 (69.90) | 34 (61.82) | 50 (44.64) | < 0.001 |
| Intentional MOI | 55 (53.40) | 19 (34.55) | 16 (14.29) | < 0.001 |
| Psychiatric History | 18 (17.48) | 16 (29.09) | 16 (14.29) | 0.07 |
| Employed | 66 (64.08) | 27 (49.09) | 66 (58.93) | 0.19 |
| > =High School | 74 (71.84) | 47 (84.45) | 101 (90.18) | < 0.01 |
| CAPS−5 PTSD Dx | 50 (48.54) | 21 (38.18) | 22 (19.64) | < 0.001 |

*Note:* SD = Standard Deviation, ISS = Injury Severity Score, PCL-5 = PTSD Checklist for DSM-5, CAPS-5 = Clinician-Administered PTSD Scale for DSM-5, MOI = Mechanism of Injury, Dx = diagnosis.

school degree (n = 48, 52.17 %); $\chi^2$ (1) = 8.87, $p$ = 0.003.

Table 1 details relevant sample characteristics by study. The three samples were largely comparable across key demographic and clinical factors, with no significant differences in age, psychiatric history, employment status, or baseline PCL-5 scores across samples. That said, differences emerged related to injury characteristics and severity. Study 3 had significantly less severe injury [$\chi^2$ (2) = 179.57, $p < 0.0001$], enrolled a lower proportion of male participants [$\chi^2$ (2) = 14.50, $p < 0.001$], and had fewer individuals who experienced intentional mechanisms [$\chi^2$ (2) = 36.98, $p < 0.001$] compared to Studies 1 and 2. Educational attainment also differed, with Study 1 having a lower rate of participants with a high school degree or higher compared to the other two samples [$\chi^2$ (2) = 12.83, $p < 0.01$]. Study 3 also had significantly lower rates of 6-month PTSD diagnosis per the CAPS-5 interview [$\chi^2$ (2) = 20.27, $p < 0.001$] and lower mean CAPS-5 severity scores post-injury [$\chi^2$ (2) = 13.06, $p = 0.002$] compared to Studies 1 and 2. These differences likely reflect variability in the injury populations targeted across the three studies.

Through administration of the CAPS-5 at 6-months post-injury, 34.44 % of the sample was identified as meeting criteria for PTSD at six-month follow-up. Symptom scores on the PCL-5 for the total sample at six months ranged from 0 to 80, with a mean score (SD) of 28.17 (22.03). Mean scores (SD) on the PCL-5 at 6-months post-injury were 50.54 (14.20) for CAPS-5 PTSD positive individuals (n = 93) and 16.55 (15.41) for CAPS-5 PTSD negative individuals (n = 177), F (1, 268) = 310.67; p < 0.001.

At the 6-month assessment, participants rated their symptoms as significantly more severe than clinicians (mean CAPS-5 total = 17.23, SD = 14.87; mean PCL-5 total = 27.97, SD = 22.08; p < .0001). Six-month CAPS-5 and PCL-5 total scores demonstrated good internal consistency (r = 0.87). Correlations between each PCL-5 and CAPS-5 item are detailed in Table 2 and ranged from r = 0.50–0.81.

**Table 2**
Means and correlations of 6-month CAPS-5 and PCL-5 items.

| | CAPS-5 | | PCL-5 | | Pearson Correlation |
|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | |
| **Intrusion** | 4.68 | 4.53 | 7.13 | 6.48 | 0.86 * |
| Intrusive Memories | 1.23 | 1.18 | 1.54 | 1.43 | 0.81 * |
| Distressing Dreams | 0.78 | 1.24 | 1.16 | 1.43 | 0.81 * |
| Dissociative Reactions | 0.52 | 0.91 | 1.15 | 1.42 | 0.69 * |
| Cued Psychological Distress | 1.16 | 1.19 | 1.79 | 1.56 | 0.78 * |
| Cued Physiological Distress | 1.00 | 1.17 | 1.49 | 1.54 | 0.78 * |
| **Avoidance** | 2.54 | 2.20 | 3.50 | 2.89 | 0.76 * |
| Internal | 1.30 | 1.19 | 1.77 | 1.50 | 0.69 * |
| External | 1.24 | 1.30 | 1.73 | 1.55 | 0.70 * |
| **Cognitions and Mood** | 5.02 | 5.59 | 8.97 | 8.23 | 0.83 * |
| Inability to Recall | 0.23 | 0.64 | 0.96 | 1.47 | 0.50 * |
| Negative Beliefs | 0.81 | 1.21 | 1.24 | 1.54 | 0.77 * |
| Distorted Blame | 0.62 | 1.02 | 1.45 | 1.57 | 0.61 * |
| Negative Emotional State | 1.03 | 1.24 | 1.44 | 1.54 | 0.80 * |
| Diminished Interest | 0.86 | 1.25 | 1.57 | 1.62 | 0.73 * |
| Detachment | 0.91 | 1.24 | 1.41 | 1.53 | 0.78 * |
| Lack of Positive Emotions | 0.57 | 1.03 | 0.96 | 1.27 | 0.73 * |
| **Arousal and Reactivity** | 4.98 | 4.20 | 8.46 | 6.43 | 0.82 * |
| Irritability | 0.85 | 1.04 | 1.17 | 1.40 | 0.70 * |
| Reckless Behavior | 0.13 | 0.51 | 0.46 | 0.95 | 0.56 * |
| Hypervigilance | 1.50 | 1.18 | 2.48 | 1.59 | 0.67 * |
| Startle Response | 0.67 | 1.02 | 1.47 | 1.53 | 0.71 * |
| Concentration Problems | 0.58 | 0.99 | 1.17 | 1.41 | 0.77 * |
| Sleep Disturbance | 1.24 | 1.43 | 1.72 | 1.62 | 0.80 * |
| **Total Symptom Score** | 17.23 | 14.87 | 27.97 | 22.08 | 0.87 * |

* Correlation is significant at the 0.01 level (2-tailed)
*Note*: SD = Standard Deviation

Logistic regression indicated the PCL-5 total symptom scores were significantly associated with CAPS-5 PTSD diagnoses, $\chi^2$ (1) = 173.83, p < 0.0001 (Nagelkerke's $R^2$ = 0.658, representing a "strong" relationship). The PCL-5's unstandardized regression coefficient was 0.113 (SE = 0.01), with an odds ratio of 1.12. Correct diagnostic classification was achieved for 88.1 % of the sample. After adjusting for significant differences across study demographics (i.e., gender, ISS, education, and interpersonal MOI), PCL-5 total symptom scores remained significantly associated with CAPS-5 PTSD diagnoses, $\chi^2$ (1) = 168.43, p < 0.0001 (Nagelkerke's $R^2$ = 0.663, representing a "strong" relationship). The PCL-5's unstandardized regression coefficient was 0.113 (SE = 0.01), with an odds ratio of 1.1. Correct diagnostic classification was achieved for 88.1 % of the sample.

Fig. 1 presents the ROC curve for diagnostic accuracy for the total sample [AUC = 0.931 (SE = 0.016), p ≤ 0.0001]. Table 3 details sensitivity and specificity rates for each cut-score on the PCL-5, along with PPV, NPV, and overall diagnostic efficiency. Using the optimal cut-score in this sample of > 33 on the PCL-5, 38.66 % of the sample (n = 104) were identified as meeting threshold. With this cut-score, 88.10 % of patients with a CAPS-5 diagnosis of PTSD at 6-months post-injury would be accurately identified (i.e., diagnostic efficiency), with a sensitivity of 89.13 and a specificity of 87.57; PPV and NPV ratios were 65.20 and 96.90, respectively.

Applying the DSM-5 diagnostic algorithm to six-month PCL-5 responses, 41.85 % of the sample (n = 113) were identified as meeting criteria for PTSD. Using this algorithm, 84.44 % of patients with a CAPS-5 diagnosis of PTSD would be accurately identified (i.e., diagnostic efficiency), with a sensitivity of 88.17 and a specificity of 82.49; PPV and NPV ratios were 72.57 and 92.99, respectively.

Fig. 2 presents the ROC curve for those in the sample with an intentional MOI [AUC = 0.922 (SE = 0.0281), $p \leq 0.0001$]. Using the optimal cut-score of > 34 on the PCL-5, 82.22 % (n = 47) of the intentional MOI sample (n = 90) were identified as meeting threshold. With this cut-score, 86.67 % of patients with a CAPS-5 diagnosis of PTSD would be accurately identified (i.e., diagnostic efficiency), with a sensitivity of 88.89 and a specificity of 84.44; PPV and NPV ratios were and, 59.90 and 96.70, respectively.

Fig. 3 presents the ROC curve for those in the sample with an unintentional MOI [AUC = 0.936 (SE = 0.0191), $p \leq 0.0001$]. Using the optimal cut-score of > 30 on the PCL-5, 33.33 % (n = 60) of the unintentional MOI sample (n = 180) were identified as meeting threshold. With this cut-score, 89.39 % of patients with a CAPS-5 diagnosis of PTSD would be accurately identified (i.e., diagnostic efficiency), with a sensitivity of 93.62 and a specificity of 87.88; PPV and NPV ratios were 66.80 and 98.10, respectively.

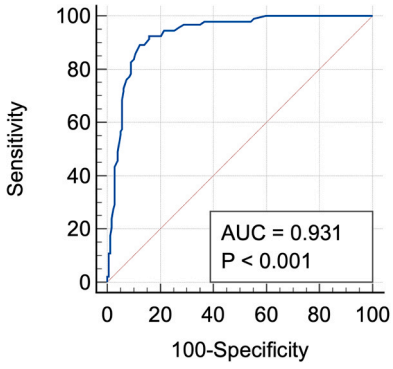


**Fig. 1.** ROC Curve for PCL-5 Diagnostic Accuracy in Total Sample (N = 270).
*Note:* ROC = receiver operating characteristic, PCL-5 = PTSD Checklist for DSM-5, AUC = area under the curve.

**Table 3**
PCL-5 cut-scores and corresponding diagnostic estimates for determining PTSD diagnosis, among full analytic sample.

| PCL Cut-Score | Sensitivity | Specificity | PPV | NPV | Diagnostic Efficiency |
|---|---|---|---|---|---|
| ≥ 0 | 100.00 | 0.00 | 20.70 | - | - |
| > 21 | 96.74 | 71.19 | 46.7 | 98.8 | 79.93 |
| > 22 | 95.65 | 72.88 | 47.9 | 98.5 | 80.67 |
| > 23 | 94.57 | 74.58 | 49.3 | 98.1 | 81.41 |
| > 26 | 94.57 | 78.53 | 53.5 | 98.2 | 84.01 |
| > 27 | 92.39 | 79.66 | 54.2 | 97.6 | 84.01 |
| > 30 | 92.39 | 84.18 | 60.4 | 97.4 | 86.99 |
| > 31 | 91.30 | 84.18 | 60.1 | 96.8 | 86.62 |
| > 32 | 89.13 | 85.88 | 62.2 | 96.9 | 86.99 |
| **> 33** | **89.13** | **87.57** | **65.2** | **96.9** | **88.10** |
| > 34 | 88.04 | 88.14 | 66.0 | 96.6 | 88.10 |
| > 36 | 85.74 | 89.27 | 67.6 | 96.0 | 88.10 |
| > 37 | 83.70 | 89.83 | 68.2 | 95.5 | 87.73 |
| > 38 | 82.61 | 90.66 | 70.5 | 95.2 | 88.10 |
| > 40 | 78.26 | 90.96 | 69.3 | 94.1 | 86.62 |
| > 41 | 77.17 | 91.53 | 70.4 | 93.9 | 86.62 |
| > 42 | 76.09 | 92.66 | 73.0 | 93.7 | 86.99 |
| > 43 | 72.83 | 93.79 | 75.4 | 93.0 | 86.62 |
| > 44 | 71.74 | 93.79 | 75.1 | 92.7 | 86.25 |
| > 45 | 68.48 | 94.35 | 76.0 | 92.0 | 85.50 |

*Note:* PPV = Positive Predictive Value, NPV = Negative Predictive Value.

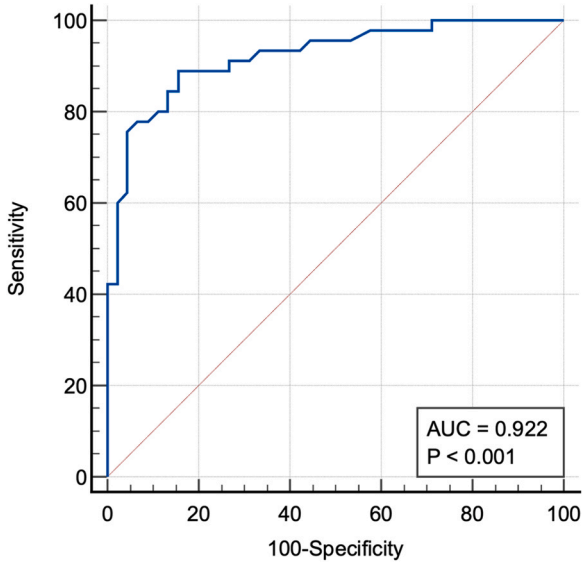


**Fig. 2.** ROC Curve for PCL-5 Diagnostic Accuracy in Intentional MOI (n = 90). *Note:* ROC = receiver operating characteristic, PCL-5 = PTSD Checklist for DSM-5, MOI = mechanism of injury, AUC = area under the curve.

## 4. Discussion

Overall, results provide support for the PCL-5 as a PTSD screening tool in Black American traumatic injury survivors treated at Level 1 trauma center settings. Within this specific clinical context, the PCL-5 demonstrated good accuracy in detecting CAPS-5 PTSD at 6-month follow-up, with 34.44 % of the current sample meeting criteria for PTSD; this is higher than the 6.1 % lifetime prevalence in the general U. S. population (Goldstein et al., 2016) and even higher than the estimated 23 % PTSD prevalence rate among Operations Enduring Freedom and Iraqi Freedom Veterans (Fulton et al., 2015). The AUC was comparable to other studies establishing optimal cut scores in predominately non-Hispanic White samples (Weathers et al., 2013; Bovin et al., 2016), and the optimal cut score identified in this marginalized sample (i.e., >33) falls within the range of previously established cut-scores (31−33) for PTSD screening, though higher than the cut-score of 30 specifically

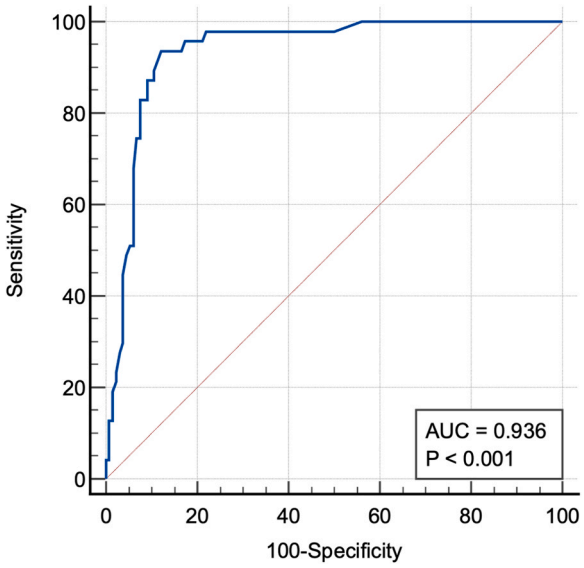


**Fig. 3.** ROC Curve for PCL-5 Diagnostic Accuracy in Unintentional Mechanisms of Injury (n = 180). *Note:* ROC = receiver operating characteristic, PCL-5 = PTSD Checklist for DSM-5, AUC = area under the curve.

recommended for general traumatic injury populations (i.e., > 30 (Geier et al., 2019)). This observation aligns with previous findings from investigations of other high-risk groups, such as military veterans, that often require higher PCL-5 symptom thresholds (Bovin et al., 2016). Collectively, this highlights that both trauma history and sociocultural variables likely influence the manifestation and reporting patterns of PTSD symptoms.

It is important to distinguish between race as a demographic category and racism as an environmental stressor. Although this study utilizes race to identify a population at heighted risk for PTSD, we acknowledge that race itself does not cause differences in PTSD symptomatology. Instead, systemic inequities, such as racial discrimination and socioeconomic disadvantage, are hypothesized contributes to the variability in PTSD diagnostic thresholds. In particular, experiences of racial discrimination have been empirically linked to increased PTSD severity and chronicity in Black populations (Sibrava et al., 2019), with the pervasive sociocultural stress of racism and inequality exerting a cumulative toll, influencing baseline functioning as well as trauma response. Literature suggests elevated vigilance and arousal in response to racial inequality and race-based trauma, though potentially resembling hypervigilance symptoms of DSM-5 PTSD, may represent an adaptive or protective response (Forsyth and Carter, 2014; Phan et al., 2020). Relatedly, marginalized populations also face higher rates of prior trauma exposure and greater socioeconomic adversity that can intensify post-injury psychiatric distress (Williams et al., 2021; Himle et al., 2009).

Of note, no one cut score classifies all cases perfectly, and appropriate thresholds are dependent on assessment goals and context. For example, in this sample the identified optimal PCL-5 cutoff differed based on injury intentionality. Specifically, for those Black American participants with an intentional MOI, a threshold of > 34 maximized diagnostic accuracy; however, among individuals with an unintentional MOI, the optimal cutoff was > 30. This pattern aligns with prior research demonstrating MOI-based differences in PCL-5 cut-scores in general trauma populations (Geier et al., 2019), and extends this work by showing that injury mechanism similarly impacts optimal screening thresholds in Black American trauma survivors. This divergence reinforces prior investigations underlining the uniquely destructive effects of interpersonal violence compared to accidental injury (Geier et al., 2019; deRoon-Cassini et al., 2010).

The observed differences in cut-scores, while numerically small,

carry meaningful clinical implications. For example, higher thresholds (e.g., >33 or >34) may reduce false positives but increase the risk of false negatives, particularly for high-risk patients who might benefit from further assessment. Tailoring cut-scores based on the clinical context is therefore critical. For settings prioritizing sensitivity, lower thresholds may be preferable to ensure no cases are missed. Conversely, higher thresholds may be beneficial in resource-constrained environments to reduce unnecessary referrals. Future research should continue to examine how injury mechanism influences optimal screening thresholds across different populations and clinical settings, as this could help refine PTSD screening practices for specific trauma subgroups. These findings underscore the importance of nuanced decision-making when applying PTSD diagnostic tools to vulnerable populations already facing significant barriers in accessing mental health treatment (Kawaii-Bogue et al., 2017).

Results have direct implications for improving PTSD detection in healthcare settings serving vulnerable groups. The current study informs screening practices at trauma centers treating Black American communities. Implementation of routine PCL-5 administration during injury follow-up appointments using appropriate cut-points can better connect Black American trauma survivors to prevention and treatment. Access to evidence-based mental health services stands to greatly improve functioning and long-term quality of life in the months and years following traumatic injury (Zatzick et al., 2008). These findings can inform both clinical reporting practices and research utilizing patient-reported outcomes, an area of heightened interest for following trauma patients longitudinally. Optimizing PTSD screening aligns with calls nationally for improved integration of mental health services within comprehensive injury aftercare to enhance long-term recovery trajectories.

Although this study is an important step in establishing the clinical utility of the PCL-5 for Black American traumatic injury populations, certain limitations should be noted. Specifically, the sample consisted of individuals from a single Midwest level I trauma center; given variability among trauma centers in factors like catchment area and injury mechanisms, the applicability of these findings is constrained to settings with similar population characteristics (e.g., the cut-scores identified in the current study may not be appropriate for screening Black American patients in other clinical contexts such as primary care clinics, community health centers, or outpatient mental health settings). Future research should examine the diagnostic performance of the PCL-5 in other Black American samples outside of this Midwest population, such as Black trauma survivors at other trauma centers or within community samples. Further, although the current study provides foundational insights into the diagnostic utility of the PCL-5 in Black American traumatic injury survivors, future research could incorporate diverse racial and ethnic groups to explore how systemic inequities, such as racism and discrimination, influence PTSD diagnostic thresholds across populations. This represents an important next step in building on the current findings to further refine PTSD assessment practices in racially and culturally diverse populations. Additionally, relying on cut-scores to establish a categorical PTSD diagnosis may have limited utility, considering the nature of PTSD has been suggested to be more effectively conceptualized as dimensional rather than categorical (Ruscio et al., 2002). Further, comparing the PCL-5 to other validated measures of PTSD and stressful life events (e.g., racial discrimination) may also elucidate cultural nuances influencing self-reported symptoms (Williams et al., 2018a, 2021). Moreover, as some research has found evidence of differential item functioning on the CAPS across racial/ethnic groups (Ruglass et al., 2020), using it as the sole gold standard benchmark may be problematic; specifically, scholars suggest cultural relevance of specific PTSD symptoms or the methods used to evaluate them are limited, leading to variations in the occurrence, significance, and severity of symptoms (Hinton and Lewis-Fernández, 2011; Rogler, 1999). In line with this, validation efforts should also test for differential item functioning in PTSD assessments as well as evaluate the dimensional structure of PTSD symptoms, as the underlying dimensions of re-experiencing, avoidance, negative alterations in cognition and mood, and hyperarousal may differ across cultural groups (Williams et al., 2018b; Ruglass et al., 2020). While our findings provide essential practical guidance for improving PTSD screening in clinical settings serving Black Americans with the tools the field currently has, future research should investigate whether aspects of posttraumatic stress unique to this population might require supplemental assessment approaches. The optimal cut-scores identified here can help improve mental health care access and referrals in trauma centers while this important conceptual work continues.

## 5. Conclusion

Overall, this study demonstrates the PCL-5's promise as an accessible PTSD screening tool in Black American traumatic injury survivors treated in Level 1 trauma center settings, provided appropriate cut-scores are utilized. That said, it is essential to underscore that, like any assessment measure, data from instruments such as the PCL-5 or CAPS-5 must be interpreted within the context of an individual's environment. It may be particularly pertinent to consider exposure to community violence as a significant factor, especially when determining different cut-offs based on intentionality. These findings reinforce the importance of recognizing and integrating lived experiences as well as racial, ethnic, and cultural identities when establishing clinical cut-points and interpreting common psychiatric measures.

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The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

## CRediT authorship contribution statement

**Vine Kaylen:** Writing – review & editing, Writing – original draft. **Torres Lucas:** Writing – review & editing, Writing – original draft. **Larson Christine L.:** Writing – review & editing, Writing – original draft, Project administration, Conceptualization. **deRoon-Cassini Terri A.:** Writing – review & editing, Writing – original draft, Project administration, Conceptualization. **Geier Timothy J.:** Writing – review & editing, Writing – original draft, Project administration, Formal analysis, Conceptualization.

## Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests. Christine Larson reports financial support was provided by National Institute of Mental Health. Terri deRoon-Cassini reports financial support was provided by National Institutes of Health. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Data availability

Data will be made available on request.

## References


Nathens, A. B., Brunet, F. P., & Maier, R. V. (2004). Development of trauma systems and effect on outcomes after injury. *The Lancet, 363*(9423), 1794–1801.

Glance, L. G., et al. (2012). Outcomes of adult trauma patients admitted to trauma centers in Pennsylvania, 2000-2009. *Archives of Surgery, 147*(8), 732–737.

DiMaggio, C., et al. (2016). Traumatic injury in the United States: in-patient epidemiology 2000–2011. *Injury, 47*(7), 1393–1403.

Michaels, A. J., et al. (2000). Outcome from injury: general health, work status, and satisfaction 12 months after trauma. *Journal of Trauma and Acute Care Surgery, 48*(5), 841–850.

O'Donnell, M. L., et al. (2010). Posttraumatic stress disorder after injury: does admission to intensive care unit increase risk? *Journal of Trauma and Acute Care Surgery, 69*(3), 627–632.

Bryant, R. A., & Harvey, A. G. (1998). Relationship between acute stress disorder and posttraumatic stress disorder following mild traumatic brain injury. *American Journal of Psychiatry, 155*(5), 625–629.

Ehlers, A., Mayou, R. A., & Bryant, B. (1998). Psychological predictors of chronic posttraumatic stress disorder after motor vehicle accidents. *Journal of Abnormal Psychology, 107*(3), 508.

Frommberger, U. H., et al. (1998). Prediction of posttraumatic stress disorder by immediate reactions to trauma: a prospective study in road traffic accident victims. *European Archives of Psychiatry and Clinical Neuroscience, 248*, 316–321.

Michaels, A. J., et al. (1999). Posttraumatic stress disorder after injury: impact on general health outcome and early risk assessment. *Journal of Trauma and Acute Care Surgery, 47*(3), 460–467.

Ursano, R. J., et al. (1999). Peritraumatic dissociation and posttraumatic stress disorder following motor vehicle accidents. *American Journal of Psychiatry, 156*(11), 1808–1810.

O'Donnell, M. L., et al. (2003). Posttraumatic disorders following injury: an empirical and methodological review. *Clinical Psychology Review, 23*(4), 587–603.

Kiely, J. M., et al. (2006). Predicting quality of life six months after traumatic injury. *Journal of Trauma and Acute Care Surgery, 61*(4), 791–798.

Kessler, R. C., et al. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry, 52*(12), 1048–1060.

Surgeons, A.Co, 5.29 Mental Health Screening, in Resources for Optimal Care of the Injured Patient, 2022. p. 107..

Hunt, J. C., et al. (2018a). Exploring the gold-standard: Evidence for a two-factor model of the Clinician Administered PTSD Scale for the DSM–5. *Psychological trauma: Theory, Research, Practice, and Policy, 10*(5), 551.

Weathers, F. W., et al. (2018). The Clinician-Administered PTSD Scale for DSM–5 (CAPS-5): Development and initial psychometric evaluation in military veterans. *Psychological Assessment, 30*(3), 383.

Agtarap, S., et al. (2018). The role of depression and social support on readmission rates within one year of traumatic injury. *Health Psychology, 37*(9), 799.

Price, M., & van Stolk-Cooke, K. (2015). Examination of the interrelations between the factors of PTSD, major depression, and generalized anxiety disorder in a heterogeneous trauma-exposed sample using DSM 5 criteria. *Journal of Affective Disorders, 186*, 149–155.

Weathers, F.W., et al., The ptsd checklist for dsm-5 (pcl-5). Scale available from the National Center for PTSD at www. ptsd. va. gov, 2013.

Geier, T. J., et al. (2019). Detecting PTSD in a traumatically injured population: The diagnostic utility of the PTSD Checklist for DSM-5. *Depression and Anxiety, 36*(2), 170–178.

Blanchard, E. B., et al. (1996). One-year prospective follow-up of motor vehicle accident victims. *Behaviour Research and Therapy, 34*(10), 775–786.

Irish, L. A., et al. (2011). Gender differences in PTSD symptoms: An exploration of peritraumatic mechanisms. *Journal of Anxiety Disorders, 25*(2), 209–216.

Van Zelst, W. H., & Beekman, A. T. (2012). Psychometric concerns in the assessment of trauma-related symptoms in older adults. *in The Oxford Handbook of Traumatic Stress Disorders*, 282.

Cubbin, C., LeClere, F. B., & Smith, G. S. (2000). Socioeconomic status and the occurrence of fatal and nonfatal injury in the United States. *American Journal of Public Health, 90*(1), 70.

Arango-Lasprilla, J. C., et al. (2007). Traumatic brain injury and functional outcomes: does minority status matter? *Brain injury, 21*(7), 701–708.

Staudenmayer, K. L., et al. (2007). Ethnic disparities in long-term functional outcomes after traumatic brain injury. *Journal of Trauma and Acute Care Surgery, 63*(6), 1364–1369.

Glance, L. G., et al. (2013). Trends in racial disparities for injured patients admitted to trauma centers. *Health Services Research, 48*(5), 1684–1703.

Alegría, M., et al. (2013). Prevalence, risk, and correlates of posttraumatic stress disorder across ethnic and racial minority groups in the US. *Medical care, 51*(12), 1114.

Sibrava, N. J., et al. (2019). Posttraumatic stress disorder in African American and Latinx adults: Clinical course and the role of racial and ethnic discrimination. *American Psychologist, 74*(1), 101.

Roberts, A. L., et al. (2011). Race/ethnic differences in exposure to traumatic events, development of post-traumatic stress disorder, and treatment-seeking for post-traumatic stress disorder in the United States. *Psychological Medicine, 41*(1), 71–83.

Williams, D. R., & Collins, C. (2001). Racial residential segregation: a fundamental cause of racial disparities in health. *Public Health Reports*.

Sheats, K. J., et al. (2018). Violence-related disparities experienced by black youth and young adults: opportunities for prevention. *American Journal of Preventive Medicine, 55*(4), 462–469.

Williams, M. T., et al. (2018a). Assessing racial trauma within a DSM–5 framework: The UConn Racial/Ethnic Stress & Trauma Survey. *Practice Innovations, 3*(4), 242.

Bird, C. M., et al. (2021). Racial discrimination is associated with acute posttraumatic stress symptoms and predicts future posttraumatic stress disorder symptom severity in trauma-exposed Black adults in the United States. *Journal of Traumatic Stress, 34*(5), 995–1004.

Williams, M., Haeny, A., & Holmes, S. (2021). Posttraumatic stress disorder and racial trauma. *PTSD Research Quarterly, 32*(1), 1–9.

Williams, M. T., et al. (2018b). Assessing PTSD in ethnic and racial minorities: Trauma and racial trauma. *Directions in Psychiatry, 38*(3), 179–196.

Ruglass, L. M., et al. (2020). Measurement nonequivalence of the Clinician-Administered PTSD Scale by race/ethnicity: Implications for quantifying posttraumatic stress disorder severity. *Psychological Assessment, 32*(11), 1015.

Alarcon, L. H., et al. (2012). Predictors of acute posttraumatic stress disorder symptoms following civilian trauma: highest incidence and severity of symptoms after assault. *Journal of Trauma and Acute Care Surgery, 72*(3), 629–637.

Chiu, K. B., deRoon-Cassini, T. A., & Brasel, K. J. (2011). Factors identifying risk for psychological distress in the civilian trauma population. *Academic Emergency Medicine, 18*(11), 1156–1160.

Ozer, E. J., et al. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: a meta-analysis. *Psychological Bulletin, 129*(1), 52.

Zatzick, D. F., et al. (2007). A nationwide US study of post-traumatic stress after hospitalization for physical injury. *Psychological Medicine, 37*(10), 1469–1480.

Bovin, M. J., et al. (2016). Psychometric properties of the PTSD checklist for diagnostic and statistical manual of mental disorders–fifth edition (PCL-5) in veterans. *Psychological Assessment, 28*(11), 1379.

Hunt, J. C., et al. (2018b). Six-month follow up of the Injured Trauma Survivor Screen (ITSS): clinical implications and future directions. *The Journal of Trauma and Acute Care Surgery, 85*(2), 263.

Geier, T. J., et al. (2023). History of racial discrimination by police contributes to worse physical and emotional quality of life in Black Americans after traumatic injury. *Journal of Racial and Ethnic Health Disparities*, 1–9.

Weis, C. N., et al. (2022). Scoring the Life Events Checklist: Comparison of three scoring methods. *Psychological Trauma: Theory, Research, Practice, and Policy, 14*(4), 714.

Baker, S. P., et al. (1974). The injury severity score: a method for describing patients with multiple injuries and evaluating emergency care. *Journal of Trauma and Acute Care Surgery, 14*(3), 187–196.

Blevins, C. A., et al. (2015). The posttraumatic stress disorder checklist for DSM-5 (PCL-5): Development and initial psychometric evaluation. *Journal of Traumatic Stress, 28*(6), 489–498.

Zatzick, D., et al. (2008). A national US study of posttraumatic stress disorder, depression, and work and functional outcomes after hospitalization for traumatic injury. *Annals of Surgery, 248*(3), 429–437.

Goldstein, R. B., et al. (2016). The epidemiology of DSM-5 posttraumatic stress disorder in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions-III. *Social Psychiatry and Psychiatric Epidemiology, 51*(8), 1137–1148.

Fulton, J. J., et al. (2015). The prevalence of posttraumatic stress disorder in Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) veterans: A meta-analysis. *Journal of Anxiety Disorders, 31*, 98–107.

Forsyth, J. M., & Carter, R. T. (2014). Development and preliminary validation of the Racism-Related Coping Scale. *Psychological trauma: Theory, Research, Practice, and Policy, 6*(6), 632.

Phan, J., et al. (2020). Hyperarousal and hypervigilance in African American male adolescents exposed to community violence. *Journal of Applied Developmental Psychology, 70*, Article 101168.

Himle, J. A., et al. (2009). Anxiety disorders among African Americans, blacks of Caribbean descent, and non-Hispanic whites in the United States. *Journal of Anxiety Disorders, 23*(5), 578–590.

deRoon-Cassini, T. A., et al. (2010). Psychopathology and resilience following traumatic injury: a latent growth mixture model analysis. *Rehabilitation Psychology, 55*(1), 1.

Kawaii-Bogue, B., Williams, N. J., & MacNear, K. (2017). Mental health care access and treatment utilization in African American communities: An integrative care framework. *Best Practices in Mental Health, 13*(2), 11–29.

Ruscio, A. M., Ruscio, J., & Keane, T. M. (2002). The latent structure of posttraumatic stress disorder: a taxometric investigation of reactions to extreme stress. *Journal of Abnormal Psychology, 111*(2), 290.

Hinton, D. E., & Lewis-Fernández, R. (2011). The cross-cultural validity of posttraumatic stress disorder: Implications for DSM-5. *Depression and Anxiety, 28*(9), 783–801.

Rogler, L. H. (1999). Methodological sources of cultural insensitivity in mental health research. *American Psychologist, 54*(6), 424.