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Detecting PTSD in a Traumatically Injured Population: The Diagnostic Utility of the PTSD Checklist for DSM-5

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Abstract

Background: The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5) is among few validated measures of PTSD severity in line with the DSM-5. Validation efforts among veteran samples have recommended cut-scores of 33 and 38 to indicate PTSD; cut-scores vary across populations depending on factors such as trauma type. The purpose of this study was to evaluate the diagnostic utility of and identify optimal cut-scores for the PCL-5 in relation to the gold standard CAPS-5 among traumatically injured individuals six months after discharge from a level I trauma center

Methods: A total of 251 participants completed the PCL-5 and CAPS-5 six-months after discharge from a level I trauma center following traumatic injury. Receiver Operating Characteristic curve analyses detailed diagnostic accuracy of the PCL-5 and identified the optimal cut-score via Youden's J index. Cut-scores were also broken down by intentional versus non-intentional injury.

Results: The PCL-5 produces satisfactory diagnostic accuracy, with adequate sensitivity and specificity, in a traumatically injured population. Estimates indicate the optimal cut-score as >30 ; the optimal cut-score for intentional injuries was >34 and >22 for non-intentional injuries.

Conclusions: This investigation provides support for the PCL-5 in detection of PTSD among injured individuals six months after discharge from a level I trauma center. PCL-5 specificity and

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sensitivity suggest clinicians working with this population can feel confident in using this measure over more onerous structured interviews (e.g., CAPS-5). This study signifies a move toward ensuring those experiencing mental health difficulties after traumatic injury are identified and connected to resources.

Introduction

According to the Center for Disease Control, in 2016 approximately 2.7 million United States (U.S.) adults experienced a single incident traumatic event resulting in injuries necessitating hospitalization (CDC, 2016). Though traumatic injury is one leading cause of death in the U.S., trauma care developments have improved survivorship, shifting efforts from preventing mortality to understanding and improving of quality of life (DiMaggio et al., 2016; Nathens, Brunet, & Maier, 2004). To this end, research has shown physical health, work status, and general recovery satisfaction is contingent on mental health following traumatic injury, even after correcting for injury severity and physical recovery status (Michaels et al., 2000).

Unfortunately, research also suggests individuals sustaining traumatic injury are at greater risk for developing mental health disorders when compared to the general population, including posttraumatic stress disorder (PTSD) (O'Donnell et al., 2010). PTSD prevalence estimates six months after injury range from 18% to 42% (Bryant & Harvey, 1998; Ehlers, Mayou, & Bryant, 1998; Frommberger et al., 1998; Michaels et al., 1999; Ursano et al., 1999), with rate variance thought to result from methodological factors, including assessment approaches as well as specific hospital and injury details (e.g., catchment area, mechanism of injury) (O'Donnell, Creamer, Bryant, Schnyder, & Shalev, 2003). Among those experiencing traumatic injury, PTSD is one of the strongest factors linked with post-injury quality of life and recovery, particularly compared to physically traumatized individuals without PTSD (Kiely, Brasel, Weidner, Guse, & Weigelt, 2006). Further, evidence suggests a more chronic presentation is likely in cases where symptoms persist beyond three to six months following trauma (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), highlighting the need for reliable diagnostic measurement, particularly around this time period.

Together, these considerations highlight PTSD's deleterious impact as well as the need for effective and efficient identification of the disorder in traumatic injury populations. As most individuals exposed to traumatic injury are resilient (Bryant et al., 2015; deRoos-Cassini, Mancini, Rusch, & Bonanno, 2010), exposure alone is an insufficient PTSD screen. The Clinician Administered PTSD Scale for DSM-5 (CAPS-5) is considered the gold standard for diagnosing and measuring PTSD (Hunt, Chesney, Jorgensen, Schumann, & deRoos-Cassini, 2017; Weathers et al., 2018); however, administration is time-consuming and requires a trained professional. With only 7% of level I and II trauma centers screening for PTSD (Love & Zatzick, 2014), providers unable to assess PTSD noted time restriction as a significant impediment in assessment of emotional functioning following traumatic injury (Powers et al., 2014). As a result, professionals rely on succinct self-report questionnaires to identify individuals that may benefit from psychological intervention.

The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5) is among few validated measures of PTSD severity both in line with the DSM-5 and demonstrating excellent psychometric properties (Price & van Stolk-Cooke, 2015). Preliminary cut-scores of both 33 and 38 have been recommended as indicating PTSD presence (Bovin et al., 2016; Hoge, Riviere, Wilk, Herrell, & Weathers, 2014; Weathers et al., 2013). These validation efforts were implemented among veteran samples, and optimal PCL cut-scores vary across populations depending on factors like trauma type (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996; Irish et al., 2011; van Zelst & Beekman, 2012). To date, there are no studies identifying PCL-5 cut-scores in relation to the CAPS-5 among traumatically injured civilians.

Underlining this need for empirically-derived PCL-5 cut-scores within traumatic injury populations, the American College of Surgeons Committee on Trauma (ACS-COT) recommends PTSD assessment for hospitalized trauma survivors (Rotondo, Cribari, Smith, & Trauma, 2014). This led groups to develop predictive non-diagnostic screens designed to become part of routine medical care, as well as comprehensive models of care like stepped collaborative care interventions and the Multi-tier Approach to Psychological Intervention after Traumatic Injury (MAPIT) (Hunt, Chesney, & Brasel, 2018; Russo, Katon, & Zatzick, 2013; Zatzick et al., 2013; Zatzick et al., 2011; Zatzick et al., 2004), both of which take a population health screening approach with risk factor screens, while suggesting further symptom assessment in those identified as at risk. Recent review efforts provide strong support for the use of this stepped collaborative care approach compared to standard intervention delivery methods, particularly as it relates to notable population impact (Melita, Lennox, Dali, Costa, & Gabbe, 2018). Appropriate cut-scores for the PCL-5 in this population do not currently exist, limiting the ability to efficiently and validly measure symptom severity (Rotondo et al., 2014). Currently, the ACS-COT supports efforts to promote policies encouraging implementation of screening protocols into trauma patient care using an evidence-based tool, such as the PCL-5.

The ACS-COT recommendation occurs within the broader context of health systems' efforts to adopt trauma-informed practices, emphasizing the impact of traumatic experiences and the need for tailored interventions (Guarino & Decandia, 2015). As injured individuals are likely to require long-term health and social services (Cameron, Purdie, Kliwer, & McClure, 2005), such as rehabilitation programs and primary care providers, understanding the effectiveness of PTSD assessment tools like the PCL-5 within post-discharge contexts is imperative in developing comprehensive trauma management systems.

The current study aimed to evaluate PCL-5's diagnostic utility among traumatically injured individuals six months after initial admission to level I trauma center. Further, the study aimed to identify optimal PCL-5 cut-scores with acceptable diagnostic efficiency, balancing false-negative diagnoses with true-positive diagnoses. Given robust evidence suggesting intentional compared to unintentional trauma is associated with higher PTSD risk and severity (Alarcon et al., 2012; Chiu, deRoos-Cassini, & Brasel, 2011; Ozer, Best, Lipsey, & Weiss, 2003; Zatzick et al., 2007), cut-scores were determined for the total sample and by mechanism of injury (MOI; i.e., intentional v. unintentional). Although preliminary general

cut-scores have been recommended, this is the first study to explore PCL-5 diagnostic cut-scores in relation to the gold standard CAPS-5 among traumatically injured civilians.

Materials and Methods

Participants and procedures

Data were combined from two projects measuring psychological and biological outcomes following traumatic injury at a Midwest level I trauma center. The studies utilized the same recruitment protocol, sampling population, and the following inclusion criteria: 1.) 18 years of age or older; 2.) Glasgow Coma Scale ≥ 13 on arrival; 3.) not self-inflicted injury; 4.) ability to communicate meaningfully in English. Recruitment, consent, and data protection procedures were approved by the Institutional Review Board.

Potential participants were screened consecutively using a daily trauma census. Data were obtained between February 2014 and May 2016, where 2,359 patients were admitted to the trauma service. Applying inclusion criteria, 1,957 were participation eligible. A total of 471 participants consented and completed baseline protocol during initial hospitalization. Retention between hospitalization and six-month follow-up was 53.3%, yielding a final analytic sample of 251. The CAPS-5 was administered by graduate- and postdoctoral-level mental health professionals an average of 6.52 months after injury (i.e., $M = 198.20$ days; $SD = 31.33$; Range = 156–353). Demographic and injury characteristics are detailed in Table 1. As with other urban hospitals (Alarcon et al., 2012; Zatzick et al., 2002), this center's intentional injury rates are elevated compared to national rates (Zatzick et al., 2007).

Measures

PTSD Checklist for DSM-5 (PCL-5).—The PCL-5 is a 20-item self-report measure assessing all DSM-5 PTSD symptoms (Weathers et al., 2013). Responses are rated on a scale of 0–4, with 0 indicating no experience of a symptom and 4 indicating severest experience of that symptom. A total symptom severity score (range: 0–80) is obtained by summing scores of all items. A provisional PTSD diagnosis can be made by treating items rated 2 or higher as a symptom endorsed, then following the DSM-5 diagnostic rule requiring 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, Weathers, Davis, Witte, & Domino, 2015).

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 impairment. 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 interviews.

Statistical Analysis

Descriptive statistics were computed, utilizing proportions for categorical variables and means and standard deviations for continuous variables. With a 53.3% six-month retention rate, difference testing was completed to identify significant differences between completers and non-completers. Specifically, chi-square test of independence was utilized for categorical variables, likelihood ratio test was utilized for nominal variables, and Mann-Whitney U test was utilized for skewed variables.

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

Logistic regression measured the degree to which CAPS-5-based PTSD diagnoses were predicted from PCL-5 symptom scores; corresponding classification rates were detailed. Receiver Operating Characteristic (ROC) curve analyses provided an effect size measure of the diagnostic accuracy of the PCL-5 (i.e., area under the ROC curve, AUC) and to identify optimal cut-scores for the PCL-5, obtained via the Youden's J index generated by 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 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 the whole analytic sample as well as by MOI (i.e., intentional v. unintentional). To calculate NPV and PPV at 6-month follow-up, 20.7% was utilized as the estimated PTSD prevalence rate for ROC curve analysis. Examining a nationally representative dataset, Zatzick and colleagues reported 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 from initial date of injury, a six-month estimate based on 12-month data is a conservative approach in approximating prevalence. Further, use of the gold standard for PTSD (i.e., CAPS-5) should reduce posterior estimate error.

Results

The analytic sample ($N = 251$) did not significantly differ from the sample lost to follow-up ($N = 220$) by sex [$\chi^2(1) = 1.88$, $p = 0.170$], race/ethnicity [$LR(4) = 4.13$, $p = 0.389$], or MOI [$LR(9) = 13.45$, $p = 0.143$]. Injury Severity Score (ISS) and length of hospital stay were captured from the trauma registry; there was no significant relationship between completers and non-completers by ISS ($U = 27402.50$, $p = 0.887$) and length of hospital stay ($U = 26607.00$, $p = 0.494$). Regarding acute trauma reactions, baseline total PCL-5 symptom score did not significantly differ between samples ($U = 27118.00$, $p = .738$). That said, age was significantly different across groups ($U = 21171.00$, $p < 0.001$), where individuals in the final analytic sample were significantly older (M age = 42.52 years; $SD = 16.70$) compared to non-completers (M age = 35.92 years; $SD = 14.25$).

Through administration of the CAPS-5, 28.3% of the sample was identified as meeting criteria for PTSD at six-month follow-up. Symptom scores on the CAPS-5 for the total sample at six months ranged from 0 to 62, with a mean score (SD) of 13.58 (15.02). Six-month PCL-5 symptom scores ranged from 0 to 78, with a mean score (SD) of 21.11 (21.04). Mean scores (SD) on the PCL-5 were 49.05 (12.81) for CAPS-5 PTSD positive individuals (n=71) and 10.09 (11.06) for CAPS-5 PTSD negative individuals (n=180), $F(1, 250) = 576.43$; $P < 0.001$. The internal consistency of the PCL-5 was 0.96 for the total score, 0.93 for criterion B items, 0.88 for criterion C items, and 0.87 for criterion D items.

CAPS-5 and PCL-5 total scores correlated strongly ($r=0.94$). Correlations between each PCL-5 and CAPS-5 item are detailed in Table 2 and ranged from $r=0.40$ to 0.84 , with the lowest correlations found for amnesia, reckless behavior, and distorted blame. Sensitivity ranged from 62.50 (reckless behavior) to 93.44 (diminished interest), and specificity ranged from 75.33 (hypervigilance) to 96.05 (negative emotional state).

Table 3 details the sensitivity, specificity, PPV, NPV, and diagnostic efficiency of the PCL-5 items, criteria, and diagnosis in relation to the CAPS-5 items, criteria, and diagnosis. Logistic regression indicated the PCL-5 total symptom scores were significantly associated with CAPS-5 PTSD diagnoses, $\chi^2(1) = 219.086$, $p < 0.001$ (Nagelkerke's $R^2 = 0.836$, representing a "large" effect). The PCL-5's unstandardized regression coefficient was 0.197 (SE=0.03), with an odds ratio of 1.217. Correct diagnostic classification was achieved for 94.0% of the sample.

Figure 1 presents the ROC curve for the total sample [AUC=0.983 (SE=0.007), $P < 0.0001$]. Table 4 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 >30 on the PCL-5, 31.08% of the sample (n=78) were identified as meeting threshold. With this cut-score, 94.02% of patients with a CAPS-5 diagnosis of PTSD would be accurately identified (i.e., diagnostic efficiency), with a sensitivity of 94.37 and a specificity of 93.89; PPV and NPV ratios were 80.10 and 98.50, respectively. In contrast, using the previously recommended cut-scores of >33 and >38 on the PCL-5, 27.09% (n=68) and 23.11% (n=58) of the sample, respectively, were identified as meeting threshold.

Applying the DSM-5 diagnostic algorithm to six-month PCL-5 responses, 33.47% of the sample (n=84) were identified as meeting criteria for PTSD. Using this algorithm, 93.63% of patients with a CAPS-5 diagnosis of PTSD would be accurately identified (i.e., diagnostic efficiency), with a sensitivity of 97.18 and a specificity of 92.22; PPV and NPV ratios were 83.13 and 98.81, respectively.

Figure 2 presents the ROC curve for those in the sample with an intentional MOI [AUC=0.980 (SE=0.0123), $P < 0.0001$]. Using the optimal cut-score of >34 on the PCL-5, 44.44% (n=32) of the intentional MOI sample (n=72) were identified as meeting threshold. With this cut-score, 94.02% of patients with a CAPS-5 diagnosis of PTSD would be accurately identified (i.e., diagnostic efficiency), with a sensitivity of 91.18 and a specificity of 97.37; PPV and NPV ratios were and, 96.88 and 92.50, respectively.

Figure 3 presents the ROC curve for those in the sample with a unintentional MOI [AUC=0.984 (SE=0.00775), $P<0.0001$]. Using the optimal cut-score of >22 on the PCL-5, 26.82% ($n=48$) of the unintentional MOI sample ($n=179$) were identified as meeting threshold. With this cut-score, 94.02% of patients with a CAPS-5 diagnosis of PTSD would be accurately identified (i.e., diagnostic efficiency), with a sensitivity of 100.00 and a specificity of 92.25; PPV and NPV ratios were 77.08 and 100.00, respectively.

Discussion

This investigation supports the use of the PCL-5 in PTSD detection among individuals six months after discharge from a level I trauma center following admission due to traumatic injury. The 0.983 AUC suggests the PCL-5 produces satisfactory diagnostic accuracy, with an adequate sensitivity and specificity ratio. Estimates indicate the optimal cut-score in this sample is >30 , lower than preliminary recommended cut-scores of >33 and >38 derived from studies using similar cut-score methodologies (Bovin et al., 2016; Weathers et al., 2013). This finding reinforces the trend in investigations sampling non-military samples to report lower optimal cut-scores than those conducted in veteran populations (Keen, Kutter, Niles, & Krinsley, 2008; McDonald & Calhoun, 2010).

In the current sample, the PCL-5 total score and all specific symptoms significantly and positively correlated with the CAPS-5 total score and symptoms, respectively. For individuals obtaining outpatient medical care (e.g., primary care, rehabilitative services) following trauma center discharge, these findings support integration of the PCL-5 into routine assessment for post-traumatic mental health. Although the PCL-5 can be completed by individuals without trained professionals, it is recommended it be proctored by a person trained in the instrument and interpreted by a clinician, underlining the importance of incorporating a mental health professional on traumatic injury care teams (Weathers et al., 2013).

Need for clinician interpretation beyond simple cut-scores is bolstered by the need to consider contextual factors, such MOI. Specifically, the optimal cut-score for intentional injuries was >34 , whereas the optimal cut-score for unintentional injuries was >22 . This difference highlights the deleterious impact an intentional MOI has on both acute and chronic distress when compared to unintentional injuries (deRoos-Cassini et al., 2010) as well as underlines the importance of considering intentional MOI status in PTSD identification, case conceptualization, and treatment planning. Specifically, if a cut score of >34 is used for unintentional injury, there would likely be a higher rate of false negatives and therefore increase the likelihood of missing individuals who develop posttraumatic distress. This difference in optimal cut-scores reflects, in part, the rationale for psychiatric diagnosis moving toward dimensional rather than categorical conceptualization, and future systems will more effectively integrate the reality that psychological distress exists on a continuum (LeBeau, Bögels, Möller, & Craske, 2015; Yee, Javitt, & Miller, 2015).

As cut-score decisions are largely based on clinical context, the purpose of the measure must be considered (Cook, Thompson, Coyne, & Sheikh, 2003; Dobie et al., 2002). Systems where patients are already involved with mental health services (e.g., community mental

health clinic) might utilize a higher cut-score, as the cost of false negatives is likely less a concern than in populations not connected to care. As most individuals in the current sample would likely first be seen in a setting such as a primary care clinic, rehabilitative center, or telehealth services, a cut-score set lower ensures most patients with symptoms receive further evaluation and treatment.

Beyond the implementation of cut-scores in PTSD measurement, one can apply a diagnostic algorithm to the PCL-5 to generate a provisional diagnosis. Compared to employing an optimal cut-score to the PCL-5 total, using the diagnostic algorithm for the current sample resulted in greater sensitivity, though less specificity and overall diagnostic efficiency. If one wants to minimize false positives (e.g., PTSD screening), utilizing a scoring procedure emphasizing sensitivity is important. Based on the current investigation's findings, use of the diagnostic algorithm in a traumatic injury population minimizes false positives compared to use of a cut-score.

This study is not without limitations. Participants in the sample were from a single Midwest level I trauma center; because optimal cut-scores vary as a function of population characteristics and the fact trauma centers differ on factors such as catchment area and mechanisms of injury, this study's cut-scores require replication and should be considered appropriate only for populations analogous to that described in Table 1. Further, as past lifetime trauma was not assessed, conclusions cannot account for how distinct histories might partly explain PTSD symptom and loss to follow-up observations as well as cut-score differences by intentionality. Older participants were significantly more likely to complete follow-up; this is similar to other investigations where being older predicted greater response to follow-up, where it is thought older populations are less transient and easier to capture over time (Koloski, Jones, Eslick, & Talley, 2013; Pirzada et al., 2004). Further limiting these findings, administration of the CAPS-5 and the PCL-5 were not counterbalanced, potentially leading to order effects. That said, one study fortuitously administered the PCL-5 before the CAPS-5 while the other administered it after the CAPS-5. The two studies did not significantly differ by mean PCL-5 and CAPS-5 scores at 6 months [PCL-5: $t(249)=-0.83$, $p=0.41$; CAPS-5: $t(249)=-0.12$, $p=0.90$], suggesting limited order effects. Beyond these limitations, PTSD is only one outcome following traumatic injury, and the use of cut-scores to determine a taxonomic PTSD diagnosis may ultimately demonstrate limited utility, as the construct of PTSD has been thought to be better conceptualized as dimensional (Ruscio, Ruscio, & Keane, 2002).

In summary, findings reinforce utilization of the PCL-5 to assess for presence and severity of DSM-5 PTSD within samples of U.S. traumatic injury survivors treated at level I trauma centers. Specifically, the specificity and sensitivity scores of the PCL-5 suggest clinicians working with traumatically injured populations can feel confident in using this measure over more onerous structured interview tools like the CAPS-5. Given assessment of all PTSD symptoms can be burdensome, abbreviated PCL-5 versions demonstrated comparable diagnostic utility to the total-scale measure in a veteran sample (Price, Szafranski, van Stolk-Cooke, & Gros, 2016); investigations into how these abbreviated versions function within traumatically injured populations would be helpful in informing use. Although some have proposed continued use of DSM-IV PTSD criteria given extensive research and

psychometric efforts on automated and brief screening instruments (Hoge et al., 2016; Russo et al., 2013), the current study's findings work to inform this ongoing discussion. Further, the novel findings underscore the importance of using cut-scores appropriate to the target population; for those with an intentional trauma, a cut-score of >34 was optimal, whereas the optimal cut-score for unintentional injuries was determined as >22. Overall, this study signifies a significant move toward ensuring that those experiencing mental health difficulties following traumatic injury are identified and connected to appropriate resources.

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Figure 1. ROC curve for the PCL-5 compared to the CAPS-5 PTSD diagnosis, among full analytic sample (n=251).

Figure 2. ROC curve for the PCL-5 compared to the CAPS-5 PTSD diagnosis, among those with intentional mechanism of injury (n=72).

Figure 3. ROC curve for the PCL-5 compared to the CAPS-5 PTSD diagnosis, among those with nonintentional mechanism of injury (n=179).

Table 1.

Demographic and injury characteristics (n=251).

	Mean (SD)
Age	42.52 (16.7)
ISS	11.20 (6.6)
Length of Hospital Stay	6.16 (5.6)
	Percentage
Education	
Less than Highschool	16.73%
Highschool	29.48%
Some College	31.47%
College	12.75%
More than College	9.56%
Sex: Male	69.30%
Race/Ethnicity	
Caucasian	50.20%
African American	41.04%
American Indian / Native Hawaiian	0.80%
Hispanic / Latino	7.96%
MOI	
MVC	32.27%
GSW	17.93%
Fall	15.14%
MCC	10.36%
Stabbing	9.56%
PSV	6.37%
Industrial Accident	4.38%
Recreational Accident	2.39%
Blunt Assault	1.20%
Accidental Glass Cut	0.40%
MOI Intentionality	
Intentional MOI (GSW, Stabbing, Blunt Assault)	28.69%
Unintentional MOI	71.31%

Note: SD=Standard Deviation; MOI=Mechanism of Injury; GSW=gunshot wound; MVC = motor vehicle crash; MCC = motorcycle crash; PSV = pedestrian struck by vehicle

Table 2.

Means and correlations of CAPS-5 and PCL-5 items.

	CAPS-5		PCL-5		Pearson Correlation
	Mean	SD	Mean	SD	
Intrusion	3.60	4.52	5.29	6.18	0.90 *
Intrusive Memories	0.93	1.19	1.24	1.44	0.80 *
Distressing Dreams	0.62	1.14	0.77	1.26	0.84 *
Dissociative Reactions	0.34	0.85	0.77	1.27	0.63 *
Cued Psychological Distress	0.97	1.18	1.45	1.53	0.78 *
Cued Physiological Distress	0.74	1.16	1.07	1.47	0.82 *
Avoidance	1.86	2.26	2.64	2.87	0.81 *
Internal	0.95	1.13	1.33	1.48	0.76 *
External	0.91	1.27	1.30	1.55	0.68 *
Cognitions and Mood	4.13	5.32	6.77	7.24	0.86 *
Inability to Recall	0.21	0.66	0.75	1.32	0.40 *
Negative Beliefs	0.63	1.13	0.94	1.41	0.75 *
Distorted Blame	0.58	1.03	1.22	1.51	0.58 *
Negative Emotional State	0.82	1.19	1.04	1.4	0.84 *
Diminished Interest	0.68	1.16	1.13	1.52	0.71 *
Detachment	0.68	1.16	1.02	1.42	0.76 *
Lack of Positive Emotions	0.54	1.04	0.73	1.16	0.73 *
Arousal and Reactivity	3.99	4.30	6.33	6.05	0.88 *
Irritability	0.71	1.00	0.93	1.27	0.73 *
Reckless Behavior	0.09	0.45	0.28	0.74	0.36 *
Hypervigilance	1.14	1.23	1.84	1.66	0.72 *
Startle Response	0.55	1.02	1.05	1.38	0.69 *
Concentration Problems	0.47	0.94	0.84	1.26	0.73 *
Sleep Disturbance	1.04	1.44	1.39	1.58	0.81 *
Total Symptom Score	13.58	15.02	21.11	21.04	0.94 *

* Correlation is significant at the 0.01 level (2-tailed)

Note: SD=Standard Deviation

Table 3.

Sensitivity and specificity of PCL-5 items/criteria/diagnosis in relation to CAPS-5 items/criteria/diagnosis, among full analytic sample (n=251).

	Sensitivity	Specificity	PPV	NPV	Diagnostic Efficiency
Intrusion	89.57	88.24	86.55	90.91	88.84
Intrusive Memories	83.95	89.41	79.07	92.12	87.65
Distressing Dreams	83.64	94.90	82.14	95.38	92.43
Dissociative Reactions	84.38	87.67	50.00	97.46	87.25
Cued Psychological Distress	85.56	86.96	78.57	91.50	86.45
Cued Physiological Distress	85.71	91.71	80.00	94.32	90.04
Avoidance	92.66	88.03	85.59	93.98	90.04
Internal	89.53	84.85	75.49	93.96	86.45
External	82.28	81.98	67.71	90.97	82.07
Cognitions and Mood	90.82	90.20	85.58	95.49	90.44
Inability to Recall	65.00	81.82	23.64	96.43	80.48
Negative Beliefs	92.73	90.77	73.91	97.79	90.84
Distorted Blame	87.50	75.86	46.15	96.25	78.09
Negative Emotional State	89.19	96.05	90.41	95.51	94.02
Diminished Interest	93.44	84.74	66.28	97.58	86.85
Detachment	87.69	89.78	75.00	95.43	89.24
Lack of Positive Emotions	77.36	91.92	71.93	93.81	88.84
Arousal and Reactivity	94.12	85.23	81.36	95.49	88.84
Irritability	72.73	87.57	67.61	90.00	83.67
Reckless Behavior	62.50	95.06	29.41	98.72	94.02
Hypervigilance	90.10	75.33	71.09	91.87	81.27
Startle Response	83.02	83.84	57.89	94.86	83.67
Concentration Problems	91.67	88.67	65.67	97.83	89.24
Sleep Disturbance	94.32	89.51	83.00	96.67	90.84
PTSD Diagnosis	97.18	92.22	83.13	98.81	93.63

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

Table 4.

PCL-5 cut-scores and corresponding diagnostic estimates for determining PTSD diagnosis, among full analytic sample (n=251).

PCL Cut-Score	Sensitivity	Specificity	PPV	NPV	Diagnostic Efficiency
0	100.00	0.00	20.70	-	-
>21	100.00	85.56	64.40	100.00	89.64
>22	98.59	87.78	67.80	99.60	90.84
>23	97.18	88.33	68.50	99.20	90.84
>24	97.18	89.44	70.60	99.20	91.63
>25	95.77	90.00	71.40	98.80	91.63
>26	95.77	90.56	72.60	98.80	92.03
>27	94.37	91.11	73.50	98.40	92.03
>30	94.37	93.89	80.10	98.50	94.02
>31	92.96	93.89	79.90	98.10	93.63
>32	91.55	95.00	82.70	97.70	94.02
>33	87.32	96.67	87.20	96.70	94.02
>34	83.10	97.22	88.60	95.70	93.23
>36	78.87	97.22	88.10	94.60	92.03
>38	77.46	98.33	92.40	94.40	92.43
>41	71.83	98.33	91.80	93.00	90.84
>42	70.42	98.89	94.30	92.80	90.84
>44	67.61	98.89	94.10	92.10	90.04
>45	66.20	99.44	96.90	91.90	90.04
>62	15.49	99.44	87.90	81.80	75.70
>63	14.08	100.00	100.00	81.70	75.70
>78	0.00	100.00	-	79.30	-

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