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Research Paper

Can the PCL-5 be used as a potential indicator of probable Complex PTSD?

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ABSTRACT

Purpose: Alongside the recognition of the ICD-11 Complex Posttraumatic Stress Disorder (CPTSD), research has been underway to develop effective assessment measures to identify CPTSD. Given the novelty of the CPTSD diagnosis and associated assessment methods, many services have exhibited caution in incorporating such methods. Yet, there remains a clinical need to identify individuals experiencing CPTSD-like difficulties as it may hold important treatment considerations. This study aims to identify a score on the commonly administered Posttraumatic Stress Disorder (PTSD) Checklist for Diagnostic and Statistical Manual of Mental Disorders 5th edition (DSM-5) (PCL-5) that may be suggestive of CPTSD-like difficulties.

Methods: Using cross-sectional data from a clinical veteran sample ($N = 227$), a Receiver Operating Characteristics (ROC) analysis using CPTSD criteria as a benchmark was conducted to identify an PCL-5 cut-off score.

Results: This study suggests a PCL-5 cut-off score of 51, which had a sensitivity of 78.8 % and a specificity of 77.8 %.

Conclusion: The potential utility of this score is discussed in terms of suitability as an indicator of potential CPTSD-like difficulties as well as potential service implications. Further research is required to further investigate the feasibility of a PCL-5 score to screen for CPTSD.

Introduction

Complex Posttraumatic Stress Disorder (CPTSD) is a novel psychological diagnosis characterised by core symptoms of Posttraumatic Stress Disorder (PTSD) (i.e., reexperiencing in the here and now, sense of threat, and avoidance of trauma reminders) and disturbances in self-organisation (DSO) (i.e., affective dysregulation, negative self-concept, and disturbances in relationships) (WHO, 2018). Despite initial caution regarding the novel diagnosis, growing evidence has supported the clinical utility of the distinction between PTSD and CPTSD. For example, individuals with CPTSD are more likely to have experienced more frequent and multiple types of adverse events during childhood (Karatzias et al., 2017), and to experience a greater number of current health comorbidities, heightened symptom burden and greater functional impairment in various life domains (Brenner et al., 2019; Murphy et al., 2021). Further supporting this distinction, meta-analytic results suggest that "gold standard" trauma interventions may be less effective in alleviating CPTSD symptoms (Coventry et al., 2020; Karatzias et al., 2019). It is worth noting that work has also focused on understanding symptomatic differences between PTSD, CPTSD and 'Borderline Personality Disorder' (e.g., Knefel et al., 2016). While a larger discussion of this remains outside the scope of the present paper, it is worth noting that recent findings suggest that the distinction between CPTSD and 'Borderline Personality Disorder' may be less clear than previously considered (see Jowett et al., 2020).

In clinical settings, PTSD is often assessed using the self-report PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013a), which demonstrates good psychometric properties across various age, cultural and trauma populations (e.g., Blevins et al., 2015; Bovin et al., 2016; Cheng et al., 2020). The PCL-5 is widely implemented as an efficient screening for PTSD due to its ease of administration and low time demands. The self-report International Trauma Questionnaire (ITQ; Cloitre et al., 2018) has gained most attention in assessing CPTSD. It has demonstrated good psychometric properties (Cloitre et al., 2021; Hyland et al., 2018), and ongoing investigation has yielded promising findings in various populations (e.g., Cyr et al., 2022). However, given the relative novelty of CPTSD and the ITQ measure, the ITQ is not yet commonly used in clinical (and research) settings. Many services have shown discretion in adapting service procedures to the novel CPTSD diagnosis, which may relate to the current state where there is yet to be an

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evidence-based treatment identified. Nonetheless, it remains clinically relevant to identify individuals who may be presenting with CPTSD to support further thorough assessment of presenting difficulties, inform treatment modifications to appropriately address needs, and reduce potential resource burdens on the individual and clinical service (e.g., reducing non-response).

Given the prevalent use of the PCL-5, one approach may be to identify a set score that may provide an *indication* of CPTSD. As such, this study explores the potential feasibility of a PCL-5 score serving as an indicator of potential CPTSD-like difficulties. It should be stressed that such a score could only function as a screening of *potential* CPTSD, which would require further assessment, and that it could merely allow commenting on the complexity of PTSD symptoms from clinical samples where only the PCL-5 is typically used.

Methods

Participants and procedure

Participants were sampled from a clinical population of veterans engaged with a UK charity delivering treatment to veterans experiencing psychological difficulties. Inclusion criteria were having completed at least one full day of employment in the Armed Forces (UK definition of a veteran) (Dandeker et al., 2006) and having undergone at least an initial assessment with the charity. Given the charity's nationwide coverage and the high number of referrals received, the sample is considered nationally-representative of UK treatment-seeking veterans. The study was approved by the charity's research department.

Anonymized data of 443 veterans who had referred to the charity between March 2021 and 2022 were extracted from the charity's database. Participants were excluded if they had not completed the PCL-5 or ITQ ($n = 214$) or 20 % or more ITQ items were missing ($n = 2$). The final sample of the study consisted of 227 treatment-seeking veterans ($M_{age} = 48.00$; $SD_{age} = 12.25$).

Measures and materials

Participants provided sociodemographic and military information and completed a range of self-report measures at the point of their initial clinical assessment following referral to the service.

Sociodemographic and military information

Participants provided sociodemographic information (age, sex, ethnicity, relationship status, current living situation). They also provided information of service enlistment (Army, Royal Navy, Royal Air Force), rank (Officer, not an officer), role (combat, combat support, non-combat), number of deployments, reason for leaving service (non-voluntary, voluntary, end of engagement), length of service, and years since leaving the military.

Trauma-related measures

The International Trauma Questionnaire (ITQ; Cloitre et al., 2018) is an 18-item self-report measure of PTSD and CPTSD symptoms over the past month. Nine items assess the presence of PTSD symptoms of reexperiencing (2), avoidance (2), sense of current threat (2), and related functional difficulties (3). Another nine items assess the presence of 'disturbances in self-organisation' (DSO) symptoms of affective dysregulation (2), negative self-concept (2), interpersonal difficulties (2), and related functional difficulties (3). Items are scored on a five-point scale ranging from 0 (*not at all*) to 4 (*extremely*). To meet CPTSD criteria, each symptom cluster and functional impairment indices need to be 'present', identified by a score of ≥ 2 on at least one of the items. The PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013a) is a 20-item self-report measure assessing symptoms of PTSD over the past month. Items are rated on a five-point scale ranging from 0 (*not at all*) to 4 (*extremely*), with greater sum scores indicating greater PTSD severity. Previous research has demonstrated a PTSD cut-off score of 34 among UK treatment-seeking veterans (Murphy et al., 2017).

Other psychological measures

The Patient Health Questionnaire (PHQ-9; Kroenke & Spitzer, 2002) is a nine-item measure of depression. Items are scored on a scale ranging from 0 (*not at all*) to 3 (*nearly every day*), and depression caseness is identified by ≥ 10. The Dimension of Anger Reactions (DAR-5; Forbes et al., 2004, 2014) is a five-item measure of anger difficulties. Items are scored on a scale ranging from 1 (*none / almost none of the time*) to 5 (*all / almost all the time*), and anger difficulties caseness is identified by ≥ 12. The Alcohol Use Identification Test (AUDIT; Babor et al., 2001) is a 10-item measure of alcohol use difficulties. Items are scored on a scale from 0 to 4, and hazardous drinking caseness is identified by ≥ 8. The Dissociative Symptoms Scale (DSS-B; Carlson & Putnam, 1993) is an eight-item measure of dissociation. Items are scored on a scale ranging from 0 (*not at all*) to 4 (*more than once a day*), with greater sum scores indicate greater dissociation difficulties.

Data analysis

Analyses were conducted using the *R* statistical environment. All scripts can be found in the Supplementary Material. Participant sociodemographic and military characteristics were summarized. Proportions of psychological outcomes were summarized per total sample and CPTSD criteria. Chi-square tests were used to explore the association between PTSD caseness on the PCL-5 and ITQ, and the association between PTSD caseness on the PCL-5 and CPTSD on the ITQ.

A Receiver Operating Characteristics Curve (ROC) analysis was conducted to identify a potential cut-off PCL-5 score, using the self-reported ITQ measure (CPTSD versus no CPTSD). The ROC analysis was conducted using the *cutpointr* R package, developed to offer more robust estimation procedures to identify optimal cutpoints and estimate their out-of-sample performance (Thiele & Hirschfeld, 2021). The diagnostic accuracy of the ROC curve was determined using the area under the curve (AUC) statistic. AUC represents how well a test predicts diagnostic caseness (Faraggi & Reiser, 2002), with 1 indicating perfect accuracy (i.e., 100 % sensitivity and 100 % specificity) and 0.5 indicating a test of no diagnostic ability (i.e., no better than chance). Current best measures demonstrate AUC values ranging between 0.7–0.8 in clinical settings and in reference to valid standard diagnoses (Youngstrom, 2014). Test performance measures (i.e., sensitivity, specificity, efficiency, positive predictive values (PPV), negative predictive values (NPV)) were calculated. The cut-off score yielding the best combination of sensitivity (i.e., true positives) and specificity (i.e., true negatives) was identified using the Youden index (*youden*) and sensitivity + specificity sum (*sum_sen_spec*). Bootstrapping with 2000 iterations were run to determine the variability of the score (95 % confidence intervals; CIs). Finally, an exploratory ROC analysis was conducted to investigate various potential cut-off scores according to sensitivity and specificity (see Table S1).

Results

Sociodemographic and military characteristics are described in Table 1. According to the ITQ, 146 participants (64.3 %) met the criteria for CPTSD and 19 (8.4 %) met criteria for PTSD only. According to the PCL-5, 202 (89.0 %) met criteria for PTSD. There was a strong association between PCL-5 and ITQ PTSD caseness, $\chi^2(1) = 48.74$, $p < .001$, $\varphi_c = 0.46$, and between PCL-5 PTSD and ITQ CPTSD caseness, $\chi^2(1) = 41.63$, $p < .001$, $\varphi_c = 0.43$.

Psychological outcomes per ITQ criteria are described in Table 2. Of those meeting criteria for CPTSD, 96.6 % met criteria of depression, 84.2 % met criteria of anger difficulties, and 43.2 % met criteria of hazardous drinking. Of those meeting criteria for PTSD only, 94.7 % met criteria of depression, 73.7 % met criteria of anger difficulties, and 42.1 % met

Table 1
Sample characteristics ($N = 227$).

	n*	%
Demographic characteristics		
Gender		
Male	205	90.3
Female	21	9.3
Ethnicity		
White	95	41.8
Other	6	2.6
Relationship status		
Single, divorced, separated or widowed	57	25.1
In a relationship	54	23.8
Living situation		
Living alone	22	9.7
Living with partner and/or children	53	23.3
Living with other	10	4.4
Military characteristics		
Service		
Army	182	80.2
Royal Navy	21	9.3
Royal Air Force	24	10.6
Rank		
Officer	14	6.2
Not officer	191	84.1
Role		
Combat	59	26.0
Combat Support	20	8.8
Non-combat	11	4.8
Number of deployments		
0	68	30.0
1	69	30.4
2	39	17.2
3	28	12.3
4+	23	10.1
Reason for leaving service		
Voluntary	44	19.4
Non-voluntary	97	42.7
End of engagement	69	30.4
Service length	$M = 12.67$	SD = 12.26
Years since leaving service**	$M = 19.12$	SD = 22.19

* n's may not add up to $N = 227$ due to missing data.
** Calculated as of 1 June 2022.

criteria of hazardous drinking. Of those not meeting CPTSD nor PTSD criteria, 71.0 % met criteria for depression, 56.5 % met criteria of anger difficulties, and 37.1 % met criteria of hazardous drinking.

The ROC curve is depicted in Fig. 1. A cut-off score of 51 (95 % CI >49 to >54) was identified, which was associated with a Youden index of 0.57 (95 % CI 0.48 to 0.69) and a sensitivity + specificity sum of 1.57 (95 % CI 1.48 to 1.69). The ROC analysis revealed an AUC of 0.85 (95 % CI 0.80 to 0.90) and a quality of efficiency index of $\kappa(0.5) = 0.55$ (95 % CI 0.45 to 0.67). Sensitivity and specificity associated with the score were 78.8 % (95 % CI 0.68 to 0.89) and 77.8 % (95 % CI 0.66 to 0.90), respectively. Of the 227 participants, 113 (58.6 %) met the PCL-5 cut-off of 51 (PPV = 86.5 %; NPV = 67.0 %).

Discussion

The study aimed to explore the feasibility of a PCL-5 cut-off score that could serve as a demarcation of likely CPTSD. That is, a score that could allow commenting on the complexity of PTSD symptoms from samples where only the PCL-5 has been used. The study identified a cut-off score of 51, which had a sensitivity and specificity of 78.8 % and 77.8 %, respectively. Having a sensitivity + specificity sum greater than 1.5 and a Youden greater than 0.5 (Power et al., 2013), the score can be considered useful. In the current sample, 64.3 % and 8.4 % met criteria for ICD-11 CPTSD and PTSD, respectively. This is in line with previous data indicating a greater prevalence of CPTSD among clinical veteran populations (Howard et al., 2021; Murphy et al., 2020). Previous findings suggest that DSM-5 criteria identifies more PTSD cases than ICD-11 criteria (e.g., Heeke et al., 2020; Wisco et al., 2016). This is in line with current findings, where 89.0 and 72.7 % were identified according to DSM-5 (PTSD) and ICD-11 (PTSD and CPTSD) criteria. Some have posited that this may reflect more stringent ICD-11 criteria regarding re-experiencing symptoms (i.e., *in the here and now*) that may increase the threshold of meeting diagnostic criteria, and/or that the inclusion of non-trauma specific symptoms in the DSM-5 criteria may widen the threshold (Shevlin et al., 2018). Despite the greater "difficulty" of attaining an ICD-11 diagnosis, it appears to be particularly sensitive to identifying those experiencing clinical levels of disability (Shevlin et al., 2018)

Considering the utility of a PCL-5 cut-off score to suggest potential CPTSD, it is necessary to highlight a few conceptual matters. Firstly, the PCL-5 is a screening measure relying on severity scores to infer whether an individual would likely meet DSM-5 PTSD criteria, a diagnosis which requires verification of the presence of a minimum number of requisite symptoms per DSM-5 criterion (APA, 2013). On the other hand, the ITQ embeds a focus on both symptom severity *and* a minimum number of requisite symptoms per ICD-11 criterion (WHO, 2018). As such, a PCL-5 score of 51 should only be considered as a brief screening for potential CPTSD that requires further assessment of presenting difficulties. Secondly, as PTSD and CPTSD are independent constructs, it may be posited that the PCL-5 may not assess some core components required to identify

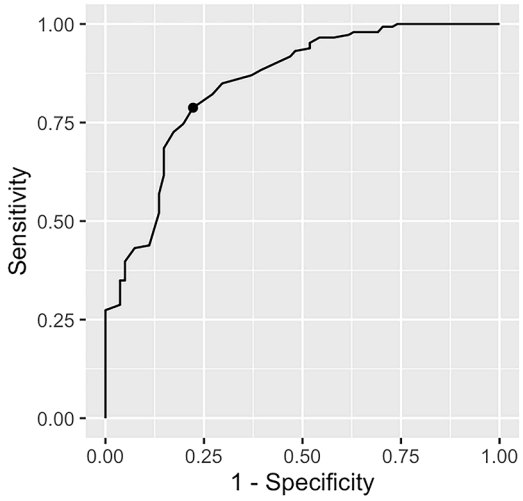


Fig. 1. Receiver operating characteristics (ROC) curve for potential cut-off PCL-5 scores against ITQ CPTSD.

Table 2
Psychological outcomes associated with ICD-11 diagnostic criteria.

	CPTSD $n = 146$ (64.3 %)		**PTSD** $n = 19$ (8.4 %)		**No PTSD** $n = 62$ (27.3 %)		**Total** $N = 227$ (100 %)	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Depression (PHQ9)	19.2	4.51	15.2	3.37	13.4	6.50	17.29	5.69
Anger difficulties (DAR-5)	16.4	6.35	13.7	5.43	12.5	5.06	15.13	6.19
Hazardous drinking (AUDIT)	8.89	8.71	8.26	7.59	7.87	7.04	8.56	8.18
Dissociation (DSS-B)*	12.55	6.76	7.68	4.61	5.20	4.16	10.17	6.83

* *n* differs on the dissociation scale whereby CPTSD ($n = 145$), PTSD ($n = 19$), No PTSD ($n = 60$), and total ($n = 224$).

potential CPTSD. Given the overlap of intrusion/reexperiencing, avoidance and arousal symptoms (APA, 2013; WHO, 2018), such concern may particularly relate to ICD-11 DSO symptoms of emotional dysregulation, interpersonal difficulties, and negative self-concept. Still, an overlap of ICD-11 DSO and DSM-5 '*negative changes in thoughts and mood*' items may be noted. Both measures include items assessing self-concept, emotional arousal, and difficulties in being connecting others. As such, while the PCL-5 may not fully assess each ICD-11 DSO cluster, it appears to assess some of the difficulties relevant to screening for probable CPTSD.

It is also worth considering utility in terms of resource benefits. Identifying individuals with CPTSD-like difficulties may offer a clinical benefit. Current reliance on homogeneity of clinical populations may partially explain why a significant proportion of individuals do not respond to evidence-based PTSD treatments (Murphy & Smith, 2018). Use of a PCL-5 cut-off score may help in recognizing heterogeneity, thus allowing the opportunity to improve trauma treatment outcomes by personalising care (Cloitre, 2015; Hendriks et al., 2018). That is, identifying individuals who may require support beyond the aims of current gold standard PTSD treatments due to symptom complexity and making appropriate treatment modifications may help reduce service non-response. As many services face resource pressures that have led them to rely on screening measures to justify service inclusion, it is important to stress that the proposed PCL-5 cut-off should not be used to exclude individuals from services but rather to serve as an indication that further assessment and treatment modifications may be required.

The present study has limitations requiring consideration. First and foremost, it is important to recognise that the analysis of the current study assumes that CPTSD may reflect more severe PTSD. It is important to highlight that this is not the case, and that the cut score could only serve to comment on the complexity of PTSD symptoms and highlight a general query of whether the individual would meet CPTSD criteria. Secondly, ROC analyses identify highly sample-specific cut-off scores. To address this, the study utilised recent methodological advances providing more robust methods to enhance the predictability of findings (Thiele & Hirschfeld, 2020). Still, it is important to note that the current sample was relatively small and restricted to a clinical veteran population and it remains unclear how useful the score may be in other populations including community veteran samples and/or other trauma populations. As such, replications in larger samples of various populations are required to test its generalizability and previous recommendations suggest that it is essential to aggregate findings from various studies to arrive at clinically significant standardized cut scores (Jacobson & Traux, 1991). Another limitation relates to the trade-off of sensitivity and specificity associated with the score. However, this was not deemed highly problematic given the intended screening nature and that consequences of false negatives (e.g., delay in care, increased severity) are deemed worse than those of false positives (e.g., further screening would determine no CPTSD diagnosis). Furthermore, the score was associated with the highest sum score of sensitivity and specificity (Table S1), supporting its usefulness. Finally, and importantly, the current study did not utilise a gold standard evaluation of CPTSD to establish a potential cut-off score on the PCL-5, and instead relied on the self-report ITQ measure. There remains to be further work evaluating proposed clinical interview CPTSD assessments, such as Complex PTSD Item Set additional to the CAPS (COPISAC; Lechner-Meichsner & Steil, 2021) and the International Trauma Interview (ITI; Roberts et al., 2019), to identify a suitable gold standard CPTSD assessment.

The present study provides an initial indication of the utility of a PCL-5 score $\geq$ 51 as a demarcation of potential ICD-11 CPTSD among treatment-seeking veterans. While further research into CPTSD and associated assessment methods are underway, services may use the PCL-5 score as an indication of difficulties that may correspond to ICD-11 CPTSD criteria. Current implementation of such a cut-score may help services identify individuals who may not respond to manualized evidence-based treatments and improve trauma treatment outcomes through the personalization of care.

CRediT authorship contribution statement

Laura Josephine Hendrikx: Writing – original draft, Formal analysis. **Natasha Biscoe:** Writing – review & editing. **Dominic Murphy:** Conceptualization, Investigation, Writing – review & editing.

Declaration of competing interest

There are no declarations of interest or conflicts of interest to declare.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.ejtd.2024.100387.

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