



ICD-11 posttraumatic stress disorder (PTSD) and complex PTSD (CPTSD) in treatment seeking veterans: risk factors and comorbidity

Dominic Murphy^{1,2} · Thanos Karatzias^{3,4} · Walter Busuttill¹ · Neil Greenberg² · Mark Shevlin⁵

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Abstract

Purpose Emerging evidence suggests that ICD-11 CPTSD is a more common condition than PTSD in treatment seeking samples although no study has explored risk factors and comorbidities of PTSD and CPTSD in veteran populations. In this study, risk factors and comorbidity between veterans meeting criteria for PTSD or CPTSD using the ICD-11 International Trauma Questionnaire (ITQ) were explored.

Methods A sample of help-seeking veterans who had been diagnosed with a mental health difficulty ($n = 177$) was recruited. Participants completed a range of mental health and functioning measures. Multinomial logistic regression analysis was conducted to explore differences in the above factors between participants meeting case criteria for PTSD, CPTSD or another mental health disorder.

Results Those with CPTSD appeared to have taken longer to seek help, reported higher rates of childhood adversity and more experiences of emotional or physical bullying during their military careers. Further, participants with CPTSD reported a greater burden of comorbid mental health difficulties including high levels of dissociation, anger, difficulties related to moral injury and common mental health difficulties and greater degree of impairment including social isolation, sleep difficulties and impaired functioning.

Conclusions Considering that CPTSD is a more debilitating condition than PTSD, there is now an urgent need to test the effectiveness of new and existing interventions in veterans with CPTSD.

Keywords PTSD · Complex PTSD · ICD-11 · Veterans · Military · Trauma

Introduction

A recent paper derived from a large cohort study of the UK military personnel showed that rates of probable posttraumatic stress disorder (PTSD), based on the Diagnostic and Statistical Manual [1], was 6.2% [2]. This is modestly higher

than the most recent prevalence rate of PTSD in the UK general population which was estimated at 4.4% in 2014 [3]. In veterans who had deployed in combat roles the prevalence of PTSD appeared to increase to 17.1%. Within UK treatment seeking veterans, 71% report meeting criteria for PTSD or complex PTSD (CPTSD) on the ICD-11, of which the majority appear to have CPTSD (80% CPTSD vs 20% PTSD) [4].

Criterion A of the diagnostic criterion for PTSD in DSM-5 specifies the nature of the traumatic stressor. Many different traumatic stressors have been reported with 1 study describing 29 different traumatic stressors [5]. However, it is well established that in addition to the type of trauma exposure, there are many pre- and post-trauma factors that moderate the association between trauma and PTSD in populations. For example, authors [6] have used data combined from 26 population-based mental health surveys ($N = 71,083$) and reported a range of pre-trauma demographic factors increased the risk of PTSD (e.g. female,

✉ Dominic Murphy
dominic.murphy@combatstress.org.uk

¹ Combat Stress, Research Department, Tyrwhitt House, Oaklawn Rd, Leatherhead KT22 0BX, UK

² King's Centre for Military Health Research, King's College London, London, UK

³ School of Health and Social Care, Edinburgh Napier University, Edinburgh, UK

⁴ NHS Lothian Rivers Centre for Traumatic Stress, Edinburgh, UK

⁵ School of Psychology, Ulster University, Derry, NI, UK

younger age, low education/income, and not being married). Post-trauma factors such as social support and help seeking have been identified as factors that reduce the risk of PTSD [7]. Xue et al., also reported on a systematic review of risk factors for combat related PTSD among military personnel and veterans [8]. The findings were largely consistent with those from general population studies; the risk for PTSD varied based on pre-trauma variables (e.g. female, low education, experiencing prior trauma), the nature of the military role (e.g. being non-officer) and combat experience (e.g. greater combat exposure, more deployments, longer length of deployments), and post-trauma variables (e.g. post-deployment social support). Studies also show that there is a high level of comorbidity associated with a PTSD diagnosis. For example, Kessler et al. found that in a civilian sample, 88.3% of males and 79.0% of females with PTSD met the diagnostic criteria for at least one other disorder, and 59% of males and 44% of females met the diagnostic criteria three or more disorders [5]. Walter et al., also reported similar rates of comorbidity in the US military, 83.3% with a single comorbid psychological disorder, and 62.2% comorbid with three psychological disorders [9]. Depression, adjustment disorder, generalized anxiety disorder, and alcohol use disorder were the most common comorbidities associated with PTSD in this study.

PTSD can be a debilitating condition and the long-term impact of PTSD in military samples has been well documented. For example, PTSD is associated with transition out of the military, social exclusion, and being at increased risk of experiencing multiple deprivation [10–16]. At the same time, there is convincing evidence that veterans with PTSD appear to have more modest treatment outcomes than members of the general public with PTSD [17, 18]. Recent research exploring treatment outcomes in veterans with PTSD suggests that, in addition to the severity of symptoms (as measured by higher scores on psychometric measures of PTSD), the presence of childhood adversity, comorbid depression, feelings of shame or guilt, dissociation and higher rates of emotional dysregulation are associated with poor treatment response [19–22]. Taken together, these findings appear to suggest a continuum of PTSD severity as described in the Diagnostic and Statistical Manual of Mental Disorders (DSM) and the International Classification of Diseases (ICD).

PTSD had previously been described in the DSM as a heterogeneous disorder with symptom clusters that included re-experience, hyper-arousal and avoidance. In the latest iteration of the DSM-5, an additional symptom cluster was added; negative alterations in cognitions and mood (NACM) [23]. The change in the DSM-5 to include the NACM cluster might help address the frequent comorbidity seen clinically between PTSD and symptoms of depression [24]. The latest version of the ICD-11 that was published in 2018,

went one step further by including two related hierarchical disorders related to traumatic stress: PTSD and Complex PTSD (CPTSD) [25, 26]. For individuals to meet diagnostic criteria for PTSD, they need to have endorsed experiencing problems on three clusters of symptoms; re-experiencing, avoidance and current sense of threat (similar to hyper-arousal symptoms on the DSM-5). In addition, to meet criteria for CPTSD, individuals have to report difficulties related to disturbances in self-organisation (DSO). DSO has been defined as symptoms within three additional clusters, affective dysregulation, negative self-concept and disturbances in relationships.

Evidence from clinical samples [27] as well as population-based samples [28] suggests that CPTSD is a more common condition than PTSD. However, limited research exists at present with regard to prevalence of ICD-11 PTSD and CPTSD in military personnel, although initial findings suggest that in this population CPTSD is also more common than PTSD. In a recently completed cohort study ($n = 178$) of a veteran help-seeking population, it was found that 56% met diagnostic criteria for CPTSD versus 14% who met criteria for PTSD [4]. Military personnel can be at greater risk for CPTSD as Maercker et al., noted that this disorder "... typically follows severe stressors of a prolonged nature or multiple or repeated adverse events from which separation is not possible" ($p. 201$) [29]. Osório et al. and MacManus et al. showed that UK military personnel experienced multiple and severe operational exposures during deployment [30, 31]. Such exposures are in a context where 'separation', or escape, is not possible. In addition, high levels of childhood adversity and childhood adversity relating to family relationships in large samples of the UK armed forces have previously been reported [32]. Therefore, many military personnel are likely to have been exposed to chronic, and varied forms, of trauma exposure that have been shown to be uniquely associated with CPTSD [33]. Evidence from non-military clinical samples also suggests that CPTSD is a highly comorbid condition and it is more likely associated with depression, borderline personality disorder (BPD) and dissociation [34]. In one population-based study involving trauma exposed individuals in the UK [28], it was found that those with CPTSD were more likely compared to those with PTSD to endorse symptoms reflecting major depressive disorder and generalized anxiety disorder.

Given that veterans appear to profit less than members of the general public with PTSD from current gold standard treatments for PTSD, and that there is emerging evidence to suggest significantly higher rates of CPTSD compared to PTSD for those veterans who seek support, it seems imperative to elucidate some of the reasons for why this may be. One explanation could be that current exposure treatments offered to military personnel with PTSD (e.g. eye movement desensitization and reprocessing: EMDR, cognitive

processing therapy: CPT, cognitive behavioural therapy: CBT or prolonged exposure: PT) may be less effective for CPTSD [35]. However, at present there is little research exploring in more detail the differences in presentations between veterans meeting criteria for PTSD and CPTSD. Understanding these differences could be important when developing new interventions to support veterans with CPTSD.

Aims

There are currently no studies on the risk factors and comorbidities of ICD-11 PTSD and CPTSD in the military. In this study, it is aimed first to determine the extent to which demographic (age, gender, relationships status, employment), military (combat role, military related bullying, age joining military, early leaver status), delayed treatment seeking, and childhood trauma predict PTSD/CPTSD status. Second, to assess if CPTSD is associated with higher levels of comorbidity compared to PTSD; a range of clinical and psychological variables were compared across the three diagnostic groups (CPTSD/PTSD/no diagnosis). It was predicted that those participants meeting the criteria for CPTSD would report highest levels of psychological and functional impairment.

Methods

Participants and procedure

Participants were sampled from a population of veterans who had engaged with a national veteran-specific mental health charity in the UK. The charity is the largest provider of veteran-specific mental health services in the UK and receives approximately 3000 referrals each year. A previous study in 2017 had extracted a nationally representative sample of veterans who had sought treatment from this service by randomly selecting 20% of those individuals who had engaged in the service over a 1-year period. A total of 403/600 (67.2%) participants were recruited to this study and the findings have been described elsewhere [36]. The current study followed up this cohort with a second wave of data collection [4].

From the original sample of 403 individuals, 69 individuals were excluded because they had either declined follow-up ($n=5$), died ($n=8$), or had incomplete contact information that prohibited being re-contacted ($n=56$). As such, the eligible sample for the current study was 334 potential participants. Data were collected by asking individuals to complete a questionnaire. The questionnaire was mailed out three times and non-responders were also follow-up by

telephone. Data were collected between October 2018 and April 2019.

Of the 403 members of the original cohort, 177 (43.9%) were successfully recruited for participation in the follow-up survey. These participants did not differ from the remaining cohort in terms of gender ($\chi^2(1)=0.59, p=0.44$), service in a combat role or not ($\chi^2(1)=0.04, p=0.85$), or whether they were likely to have a common mental health disorder as determined by the 12-item General Health Questionnaire (GHQ-12) ($\chi^2(1)=0.04, p=0.84$). When compared on a 4-category age variable (< 35 years, 35–44 years, 45–54 years, 55+ years), the participants in the follow-up group were older than the remaining cohort with more than expected in the 45–54 years and 55+ age groups ($\chi^2(3)=0.13.12, p<0.01$). Consequently, a weight variable based on age group was calculated and used in all subsequent analyses.

Materials

Socio-demographic and military characteristics

Participants completed questions asking about socio-demographic characteristics including information on gender, age, current relationship status, current employment status and length of time between leaving the military and seeking support (greater or less than five years). Military characteristics included which service they had been enlisted within (Royal Navy, Army or Royal Air Force), enlistment type (regular, reservist or both), length of service (from which early service leavers could be identified and defined as completing less than four years of continuous service) and whether they were in receipt of a war pension.

ICD-11 PTSD and CPTSD

PTSD and Complex PTSD (2018/2019) were assessed by the self-administered International Trauma Questionnaire (ITQ) (Cloitre et al., 2018). Participants were asked to complete the ITQ in relation to their index trauma event. Six items measure PTSD symptoms, and six items measure 'Disturbance in Self-Organization' (DSO) symptoms. The PTSD items ask how much the respondent has been bothered by each symptom in the past month, and the DSO items are completed in terms of how the respondent typically feels, thinks about oneself, and relates to others. The PTSD and DSO symptoms are each accompanied by three items measuring functional impairment caused by these symptoms. All items are answered on a five-point Likert scale, ranging from 0 (Not at all) to 4 (Extremely) with possible scores on the PTSD and DSO scale ranging from 0 to 24. A symptom is considered present where a score of ≥ 2 (Moderately) is achieved. The psychometric properties of the ITQ have been

demonstrated in multiple general populations [37, 38] and clinical [39, 40] samples. The internal reliability (Cronbach's alpha) of the PTSD ($\alpha=0.90$) and DSO ($\alpha=0.93$) items in the current sample was excellent.

PTSD requires that (a) a person is exposed to a least one traumatic life event, (b) at least one symptom is present from each PTSD symptom cluster (re-experiencing, avoidance, and sense of threat), and (c) at least one indicator of functional impairment associated with these symptoms is endorsed. Diagnosis of CPTSD requires that all of the PTSD criteria are met, that at least one symptom is endorsed from each DSO cluster (affective dysregulation, negative self-concept, and disturbed relationships), and at least one indicator of functional impairment related to these symptoms is endorsed. The ICD-11 diagnostic rules permit a diagnosis of PTSD (if the individual endorses re-experiencing, avoidance and sense of threat symptoms but not DSO symptoms) or CPTSD if the individual endorses re-experiencing, avoidance and sense of threat symptoms and DSO symptoms).

Clinical and psychological variables

Childhood and military adversity: childhood adversity was assessed using items that had previously been used in an ongoing epidemiological survey of the wider UK military [41]. Participants were asked if they had been exposed to 16 difficult early life experiences. Participants either indicated 'Yes' (1) or 'No' (0) about their exposure, and a total childhood adversity score was calculated by summing the scores producing scores with a potential range of 0–16. The summed scores were categorised to indicate 'high childhood adversity' represented by scores of 6 or greater, and low childhood adversity for scores of 5 or lower [36]. In addition to childhood adversity, four questions were asked about exposure to potential non-combat adversity during military service (emotional bullying, physical assault, sexual harassment and sexual assault) and participants either indicated 'Yes' (1) or 'No' (0).

Anxiety and depression: symptoms of anxiety and depression were measured using the 12-item General Health Questionnaire (GHQ-12) [42]. The GHQ-12 is a self-report scale scored using the GHQ-scoring method (0, 0, 1, 1), and total possible scale scores range from 0 to a maximum of 12, with higher scores indicating higher levels of psychological distress. Cronbach's alpha was $\alpha=0.90$.

Anger (2017): difficulties with anger were assessed with the five-item Dimensions of Anger Reactions Scale (DAR-5) [43]. The items are responded to on a 5-point Likert scale ranging from 1 (None or almost none of the time) to 5 (All or almost all of the time), and the scores were summed to produce an overall scale score ranging from 5 to 25. Higher scores reflect higher levels of anger. We were

not able to calculate Cronbach's alpha because only total scores, rather than raw scores, were available.

Alcohol use: alcohol use and related problems were assessed using the Alcohol Use Disorders Identification Test (AUDIT) [44]. The scale comprises 10 items referring to alcohol consumption and alcohol-related problems in the past 12 months and items are scored on a scale from 0 to 4, producing a range of scores from 0 to 40. Higher scores reflect higher levels of hazardous drinking. Cronbach's alpha was $\alpha=0.92$.

Functional impairment: functional impairment was measured using the 5-item Work and Social Adjustment Scale (WSAS) [45]. The WSAS is scored on a 9-point Likert scale from 0 (no impairment) to 8 (very severe impairment) and covers the functioning domains of ability to work, home management, social leisure, private leisure, and ability to form and maintain close relationships. The WSAS produces possible scores ranging from 0 to 40, with higher scores indicating greater impairment. Cronbach's alpha was $\alpha=0.85$.

Moral injury: moral injury has been defined as the psychological distress which may result from actions, or the lack of them, which violate one's moral or ethical code [46]. Moral Injury was measured using the 17-item Expressions of Moral Injury Scale (EMIS) [47]. The items are responded to on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), and the scores were summed to produce an overall scale score ranging from 17 to 85. Higher scores reflect higher levels of moral injury expression. Cronbach's alpha was $\alpha=0.94$.

Sleep problems: sleep problems were measured using the 8-item Sleep Condition Inventory (SCI) [48]. The SCI comprises two items, each assessing four areas of sleep disruption including sleep continuity, sleep satisfaction/dissatisfaction, severity, and attributed daytime consequences of poor sleep. Items are responded to on 5-point scales (scored 0–4), and produces possible scale scores ranging from 0 to 32, with higher scores indicative of better sleep. Cronbach's alpha was $\alpha=0.87$.

Dissociation: dissociation was measured using the 8-item Dissociative Symptoms Scale (DSS-B) which assesses moderately severe trauma-related intrusions, gaps in awareness or memory, and distortions in perceptions of oneself or surroundings that persist after traumatic stress [49]. Participants respond to each item using a five-point Likert scale ranging from 0 ('not at all') to 4 ('more than once a day'). Cronbach's alpha was $\alpha=0.89$.

Social connectedness: Two questions were used to assess loneliness (How often do you feel lonely?) and social isolation (How often do you feel socially isolated?) and used a 5-point Likert scale ranging from 1 to 5, and the scale scores from each question were used separately.

Data analysis

The socio-demographic and military characteristics were calculated for the sample. Following this, statistical analysis was conducted in three linked phases. First, the rates of CPTSD and PTSD for the follow-up sample were estimated using the diagnostic algorithm for the ITQ. Second, potential military, and childhood adversity factors were identified and the association between these and diagnostic status was assessed using chi-square tests. Third, a multinomial logistic regression model was used to test which variables predicted CPTSD and PTSD (compared to no disorder). For the analysis to have adequate power, those risk factors that were not associated with diagnostic status (Chi-square $p > 0.10$) were excluded. Finally, the diagnostic groups were compared on a range of psychological variables (loneliness, social isolation, sleep problems, dissociation, and moral injury). One-way ANOVAs with Scheffe post hoc tests were used. All analyses were conducted using SPSS.

Ethical approval

Ethical approval for this study was granted by the Edinburgh Napier University Ethics Committee (reference number: SHSC0030).

Results

Overall, 120 participants (68.0%) met the diagnostic criteria for either stress disorder, with more participants meeting the criteria for CPTSD ($n=96$, 54.3%) than PTSD ($n=24$, 13.8%). Table 1 describes the socio-demographic characteristics of the sample. The majority were male (95.1%), aged 45 years old or above (78.5%), currently in a relationship (66.3%) and not in employment (72.0%). Military characteristics were reported in Table 2. The majority of the sample had served in the Army (86.5%), had deployed at least once (90.7%) and were in receipt of a war pension (60.8%).

Table 3 shows the bivariate associations between potential demographic, military, and trauma risk factors with diagnostic status. Compared to those who did not meet criteria for probable PTSD or CPTSD, participants who met criteria for probable CPTSD were likely to be younger (< 35 years), unemployed, and to have experienced emotional bullying and physical assault in the military, taken longer time to seek support (> 5 years), and have experienced high levels of childhood trauma. Compared to no PTSD stress disorder, participants who met the criteria for probable PTSD were more likely to be aged between 35 and 54 years, less likely

Table 1 Demographic characteristics of follow-up sample ($N=177$)

	<i>N</i>	%
Gender (male)	169	95.1
Age		
< 35 years	12	6.7
35–44 years	26	14.9
45–54 years	56	31.7
55+ years	83	46.8
Relationship status		
Married/cohabiting	106	59.9
In relationship/not living together	11	6.4
Single	27	15.3
Separated	5	2.9
Divorced	23	13.0
Widowed	5	2.5
Employment status		
Full/part time	48	28.0
Stay at home parent or caregiver	3	1.7
Not working	11	6.1
Not working due to ill health	74	43.1
Retired	36	21.0

Note *N*'s may not add up to $N=177$ because of missing data

Table 2 Military characteristics of follow-up sample ($N=177$)

	<i>N</i>	%
Service		
Royal navy	12	6.7
Army	153	86.5
Royal air force	12	6.9
Enlistment		
Regular	116	68.2
Reservist	6	3.2
Regular and reservist	49	28.6
Length of service		
< 4 years	17	9.4
4–14 years	89	50.1
15 years+	71	40.5
Number of deployments		
0	16	9.3
1	96	54.4
2	35	19.6
3 or more	30	16.7
War pension		
Yes	108	60.8

Note *N*'s may not add up to $N=177$ because of missing data

Table 3 Potential demographic, military, trauma risk factors and association with diagnostic status

	CPTSD <i>N</i> (%)	PTSD <i>N</i> (%)	No PTSD <i>N</i> (%)	Total <i>N</i> (%)	χ^2	<i>df</i>	<i>p</i>
	96 (54.3%)	24 (13.8%)	57 (32.0%)	177 (100%)			
Gender (male)	91 (94.8%)	23 (95.8%)	54 (94.7%)	168 (94.9%)	0.049	2	0.976
Age					19.923	6	0.003
< 35 years	2 (2.1%)	0 (0.0%)	10 (17.9%)	12 (6.8%)			
35–44 years	16 (16.5%)	6 (25.0%)	4 (7.1%)	26 (14.7%)			
45–54 years	34 (35.1%)	7 (29.2%)	15 (26.8%)	56 (31.6%)			
55+ years	45 (46.4%)	11 (45.8%)	27 (48.2%)	83 (46.9%)			
Relationship (in relationship)	53 (55.2%)	17 (70.8%)	36 (63.2%)	106 (59.9%)	2.326	2	0.313
Employment (FT/PT)	21 (21.9%)	5 (20.0%)	22 (39.3%)	48 (27.1%)	6.171	2	0.046
Combat role	66 (68.8%)	15 (60.0%)	29 (50.9%)	110 (61.8%)	4.879 ^a	2	0.087
Emotional bullying in military	48 (55.8%)	9 (37.5%)	20 (36.4%)	77 (46.7%)	6.047	2	0.049
Physical assault in military	40 (49.4%)	5 (22.7%)	17 (31.5%)	62 (39.5%)	7.354 ^a	2	0.025
Sexual harassment in military	6 (8.2%)	2 (10.0%)	4 (7.5%)	12 (8.2%)	0.116 ^a	2	0.944
Sexual assault in military	7 (9.7%)	2 (10.0%)	3 (5.7%)	12 (8.3%)	0.754 ^a	2	0.686
Joined > 18 years old	71 (74.0%)	18 (75.0%)	32 (57.1%)	121 (68.8%)	5.160 ^a	2	0.076
Time to contact CS > 5 years	49 (51.0%)	16 (66.7%)	18 (32.1%)	83 (47.2%)	9.313 ^a	2	0.009
Early service leaver	11 (11.5%)	2 (8.3%)	4 (7.0%)	17 (9.6%)	0.864 ^a	2	0.649
High childhood adversity	54 (55.7%)	11 (45.8%)	20 (35.1%)	85 (47.8%)	6.137 ^a	2	0.046

Note *N*'s may not add up to *N* = 177 because of missing data

to be in full-time or part-time employment, and taken longer to contact Combat Stress (> 5 years).

For the multinomial logistic regression, the predictor variables were age (continuous), employment (FT/PT), combat role, emotional bullying in military, physical assault in military, joined military > 18 years old, time before contacting CS > 5 years, and high childhood adversity and the criterion variable was diagnostic status (CPTSD, PTSD, no disorder). The overall model was statistically significant ($\chi^2(16) = 42.18$, $p < 0.001$). The estimates for probable CPTSD showed that having a combat role (OR 3.08: 95% CI 1.29–7.36), joining the military after 18 years (OR 2.59: 95% CI 1.10–6.08), and high childhood adversity (OR 2.35: 95% CI 1.05–5.25) all significantly increased the likelihood of probable CPTSD

compared to having no disorder. The estimates for probable PTSD showed that waiting 5 years or more (OR 1.69: 95% CI 0.71–4.00) before contacting the service significantly increased the likelihood of PTSD compared to having no disorder (Table 4).

A series of one-way ANOVAs were used to test if the mean scores on a range of psychological variables differed across the three diagnostic groups. Table 5 shows the descriptive and test statistics. Significant main effects were found for all variables except hazardous drinking. Post hoc tests showed that the mean scores for the probable CPTSD group were significantly higher than the probable PTSD and no disorder groups, and that the probable PTSD and no disorder groups were not significantly different.

Table 4 Multinomial logistic regression results predicting CPTSD and PTSD

	CPTSD			PTSD		
	<i>B</i> (se)	Sig	OR (95% CI)	<i>B</i> (se)	Sig	OR (95% CI)
Age	−0.26 (0.22)	0.254	1.29 (0.82–2.03)	−0.06 (0.32)	0.838	0.93 (0.49–1.76)
Employment (FT/PT)	−0.68 (0.46)	0.147	0.50 (0.20–1.26)	−1.38 (0.77)	0.076	0.25 (0.05–1.15)
Combat role	1.12 (0.44)	0.011	3.08 (1.29–7.36)	0.26 (0.61)	0.672	1.29 (0.38–4.32)
Emotional bullying in military	0.95 (0.57)	0.097	2.59 (0.84–8.00)	0.75 (0.84)	0.370	2.12 (0.40–11.01)
Physical assault in military	0.46 (0.56)	0.410	1.58 (0.52–4.75)	−0.59 (0.86)	0.494	0.55 (0.10–3.01)
Joined > 18 years old	0.95 (0.43)	0.029	2.59 (1.10–6.08)	0.63 (0.60)	0.293	1.88 (0.57–6.16)
Time to contact CS > 5 years	0.52 (0.43)	0.230	1.69 (0.71–4.00)	1.69 (0.64)	0.009	5.44 (1.52–19.44)
High childhood adversity	0.85 (0.41)	0.037	2.35 (1.05–5.25)	0.31 (0.57)	0.585	1.37 (0.44–4.23)

Table 5 Differences between diagnostic groups on psychological variables

	CPTSD ^a	PTSD ^b	No PTSD ^c	Total	Range	ANOVA	Post hoc
Loneliness	3.89 (0.99)	3.03 (1.23)	3.02 (1.11)	3.50 (1.14)	1–5	$F(2, 172)=14.36, p<0.001$	a>b,c
Socially isolated	3.97 (0.95)	3.28 (1.06)	3.40 (0.95)	3.69 (1.007)	1–5	$F(2, 171)=8.46, p<0.001$	a>b,c
Sleep problems (SCI)	7.04 (5.41)	9.60 (7.36)	13.83 (7.28)	9.56 (7.00)	0–32	$F(2, 174)=20.37, p<0.001$	a,b<c
Dissociation (DSS)	17.30 (7.51)	9.71 (4.25)	8.84 (6.41)	13.55 (7.92)	0–32	$F(2, 174)=31.85, p<0.001$	a>b,c
Moral injury (EMIS)	60.40 (14.68)	46.75 (12.37)	45.36 (17.81)	53.77 (17.05)	17–85	$F(2, 174)=19.30, p<0.001$	a>b,c
Functioning (WSAS)	26.122 (9.37)	26.732 (8.29)	20.375 (9.12)	24.352 (9.51)	0–40	$F(2, 174)=7.91, p=0.001$	a>b,c
Drinking (AUDIT)	9.53 (10.25)	5.09 (5.940)	8.75 (8.58)	8.67 (9.32)	0–40	$F(2, 174)=2.235, p=0.110$	
CMD (GHQ12)	7.68 (3.93)	5.31 (4.03)	4.54 (3.76)	6.34 (4.14)	0–12	$F(2, 174)=12.465, p<0.001$	a>b,c
Anger (DAR5)	16.89 (7.64)	12.21 (6.66)	11.59 (7.86)	14.52 (7.97)	0–28	$F(2, 173)=9.881, p<0.001$	a>b,c

Discussion

The current study examined differences in socio-demographic characteristics, self-reported exposure to adversity and health outcomes between veterans meeting criteria the ICD-11 criteria for probable PTSD, CPTSD and no PTSD disorder (but seeking help for other mental health difficulties). Similarly with the general population [28], results showed that participants with probable CPTSD were younger and took longer to seek help than those with either probable PTSD or no PTSD. Interestingly though, results also replicate findings in other military samples with PTSD where it was observed that the average length of time to seek help is 11 years [36]. In addition, those with probable CPTSD reported higher rates of childhood adversity and being more likely to have been the victim of emotional or physical bullying during their military careers. The relationship between childhood adversity and probable CPTSD replicates findings observed in non-military samples [40]. In line with Karatzias et al., (2016b), there appeared to be clear evidence of increased functional impairment (measured using the WSAS) associated with a diagnosis of probable CPTSD as those individuals with CPTSD were more likely to report feeling socially isolated and lonely as well as reporting higher rates of functional impairment. There was also evidence for poorer quality sleep for both individuals meeting for CPTSD and PTSD compared to the no PTSD group.

A picture also emerged suggesting that those with probable CPTSD were more likely to report comorbidities. When comparing between participants with PTSD or no PTSD and those with CPTSD, individuals with CPTSD reported higher scores for common mental health difficulties (anxiety and depression), higher rates of dissociation and more severe difficulties with anger. These findings are in line with findings from non-military clinical samples [34] and general population trauma exposed samples [27], where CPTSD has also been shown to be a more comorbid condition than PTSD.

In addition, those with probable CPTSD reported a greater impact for potentially morally injurious events than those with PTSD or no PTSD. The findings between increased difficulties related to moral injury and CPTSD are intriguing. A recent meta-analysis has demonstrated that reporting moral injuries is more strongly associated with PTSD than a range of other mental health difficulties [50]. The reason behind the association between CPTSD and moral injury is unclear, however, it has been suggested that moral injury is associated with potentially more complex emotional responses (such as shame and guilt) [51–53] which are also closely related to CPTSD.

Implications

The current study has important implications for both researchers and clinicians. There is a wealth of data describing the barriers for treatment for veterans with mental health difficulties and also evidence suggesting veterans with PTSD are less likely to seek support than peers with other mental health difficulties [54]. However, for the first-time, data have been presented that implies that veterans with probable CPTSD appear to take longer to seek help than those with PTSD. This could lead to an increased erosion of resources (e.g. social support) for veterans with CPTSD which could be compounding their difficulties. Alternatively, it could be hypothesised that PTSD becomes more complex the longer it is left untreated. As such, there appears an argument for early intervention in those with PTSD and that those with more complex PTSD symptoms may need additional support to address the barriers that may be preventing them from seeking help sooner. There is clearly a need for further qualitative work to explore the help-seeking patterns of those with CPTSD.

The presence of CPTSD risk factors such as childhood adversity, common CPTSD comorbidities such as dissociation, anxiety and depression, and having served within a combat role, have all been observed to be predictors of poorer treatment outcomes in veteran samples [19, 20, 22,

55]. It is currently unknown if existing treatments for PTSD are suitable for CPTSD although one recent meta-analytic review [35] suggested that existing interventions, commonly used for PTSD, such as CBT or EMDR can be less useful for CPTSD symptoms, if there is history of childhood trauma. Further work is required to test the effectiveness and acceptability of existing and new interventions for CPTSD in the military.

Limitations

The study profited from drawing a sample from a representative study of UK veterans who had engaged with a national charitable mental health service. This should provide some confidence that the results presented here have good ecological validity. However, there are a number of limitations that need to be considered when interpreting the presented data. First, the participants may differ from veterans who seek help from those offered by a state-funded provider [the UK the National Health Service (NHS)] rather than a charity. For example, it may be that veterans seeking support from a charity could have previously disengaged from state-funded services. Countering this, however, the charity from which the sample was drawn receives a substantial number of referrals annually and is a recognised treatment pathway for the government funded NHS in the UK. Further, previous research has shown close similarities, in terms of demographic characteristics and mental health presentations, between the population accessing this charity and that of other help-seeking veterans other NATO allies (such as veterans accessing similar national mental health treatment programmes in Australia) which would suggest that the population is not unique to this particular charity [56].

Second, those with CPTSD reported higher rates of both childhood adversity as well as emotional and physical bullying during their military careers. The potential issue of recall bias affecting these findings needs to be considered. It could be that those who are most unwell are also more likely to recall experiencing more examples of adversity during their childhoods and military careers, or conversely, were more likely to fail to recall them due to memory problems associated with PTSD and dissociation. Nevertheless, there is also evidence suggesting that recall of childhood adversities can be considered reliable and it is not influenced by current mental health difficulties [57, 58].

Third, data were collected at two different time points which could have introduced bias into the findings. For example, it might be that participants, who met criteria for CPTSD in the current study that collected data in 2018/2019, would not have done so when data were collected during 2017 for the previous study. However, given the chronicity of the mental health presentations, which participants take on average 11 years to seek support, it is likely that there

were few differences in the presentations between the two time points [36]. Finally, it is important to recognise the reliance on self-administered measures which provide evidence of probable diagnosis rather than diagnosis.

Conclusions

Notwithstanding its limitations, this is the first study exploring risk factors and comorbidities of ICD-11 PTSD and CPTSD in the military. The data presented within this paper suggest that treatment seeking veterans with probable CPTSD report more severe comorbid health difficulties and a greater impact on functioning than those seeking support for PTSD or other mental health difficulties. This suggests the importance of assessing and screening for CPTSD when treating veterans. Further work is needed on testing existing and novel treatments for CPTSD in the military.

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Compliance with ethical standards

Conflict of interests None to declare.

References

1. McFarlane A (2014) PTSD and DSM-5: unintended consequences of change. *Lancet Psychiatry* 1:246–247
2. Stevelink S et al (2018) Mental health outcomes at the end of the British involvement in the Iraq and Afghanistan conflicts: a cohort study. *Br J Psychiatry* 0:1–8. <https://doi.org/10.1192/bjp.2018.175>
3. Fear N et al (2014) Chapter 4: Posttraumatic stress disorder. In: McManus S et al (eds) *Mental health and wellbeing in England: adult psychiatric morbidity survey 2014*. NHS Digital, Leeds
4. Murphy D et al (2020) A validation study of the International trauma Questionnaire to assess ICD-11 posttraumatic stress disorder (PTSD) and Complex PTSD in military personnel. *Br J Psychiatry* 216(3):5
5. Kessler RC et al (2017) Trauma and PTSD in the WHO World Mental Health Surveys. *Eur J Psychotraumatol*. <https://doi.org/10.1080/20008198.2017.1353383>
6. Koenen K et al (2019) Posttraumatic stress disorder in the world mental health surveys. *Psychol Med* 47(13):2260–2274
7. Bisson J et al (2007) Psychological treatments for chronic post-traumatic stress disorder: systematic review and meta-analysis. *Br J Psychiatry* 190:97–104

8. Xue C et al (2015) A meta-analysis of risk factors for combat-related PTSD among military personnel and veterans. *PLoS ONE*. <https://doi.org/10.1371/journal.pone.0120270>
9. Walter K et al (2009) Prevalence of posttraumatic stress disorder and psychological comorbidities among US active duty service members, 2006–2013. *J Trauma Stress*. 22(1):11–19 (2018. 31(6):837–844)
10. Karstoft K et al (2015) Community integration after deployment to Afghanistan: a longitudinal investigation of Danish soldiers. *Soc Psychiatry Psychiatr Epidemiol* 50(4):653–660. <https://doi.org/10.1007/s00127-014-0973-2>
11. Sayer N et al (2015) Iraq and Afghanistan war veterans with reintegration problems: differences by Veterans Affairs health-care user status. *Adm Policy Mental Health* 42(4):493–503. <https://doi.org/10.1007/s10488-014-0564-2>
12. Murphy D, Palmer E, Busuttill W (2016) Mental health difficulties and help-seeking beliefs within a sample of female partners of UK Veterans diagnosed with Post-Traumatic Stress Disorder. *J Clin Med*. <https://doi.org/10.3390/jcm5080068>
13. Murphy D, Palmer E, Busuttill W (2016) Exploring indices of multiple deprivation within a sample of veterans seeking help for mental health difficulties residing in England. *J Epidemiol Public Health Rev*. <https://doi.org/10.16966/2471-8211.132>
14. Murphy D, Palmer E, Ashwick R (2017) Multiple deprivation in help-seeking UK veterans. *Combat Stress*, London
15. Iversen A et al (2005) What happens to British veterans when they leave the armed forces? *Eur J Public Health* 15(2):175–184
16. Pinder R et al (2011) Social exclusion amongst UK ex-service personnel based on measures of employment. *Occup Environ Med* 68(Suppl_1):A50
17. Kitchiner N et al (2012) Systematic review and meta-analysis of psychosocial interventions for veterans of the military. *Eur J Psychotraumatol* 3:19267. <https://doi.org/10.3402/ejpt.v3i0.19267>
18. Bisson J et al (2013) Psychological therapies for chronic post-traumatic stress disorder (PTSD) in adults. *Cochrane Database Syst Rev* 12:1–241
19. Phelps A et al (2018) Key patterns and predictors of response to treatment for military veterans with post-traumatic stress disorder: a growth mixture modelling approach. *Psychol Med* 48(1):95–103
20. Currier J et al (2014) Residential treatment for combat-related posttraumatic stress disorder: identifying trajectories of change and predictors of treatment response. *PLoS ONE* 9(7):e101741. <https://doi.org/10.1371/journal.pone.0101741>
21. Richardson D, Eihai J, Sareen J (2011) Predictors of treatment response in Canadian combat and peacekeeping veterans with military-related PTSD. *J Nerv Mental Dis* 199(9):639–645
22. Murphy D, Smith K (2009) Treatment efficacy for UK veterans with posttraumatic stress disorder: latent class trajectories of treatment response and their predictors. *J Trauma Stress* 22(1):11–19 (2018. 31: 753–763)
23. American Psychiatric A (2013) Diagnostic and statistical manual of mental disorders, vol 5th. APA, Washington
24. Hoge C et al (2016) Unintended consequences of changing the definition of posttraumatic stress disorder in DSM-5: critique and call for action. *JAMA Psychiatry* 73(7):750–752
25. Brewin CR et al (2017) A review of current evidence regarding the ICD-11 proposals for diagnosing PTSD and complex PTSD. *Clin Psychol Rev* 58:1–5. <https://doi.org/10.1016/j.cpr.2017.09.001>
26. World Health O (2018) International statistical classification of diseases and related health problems (11th Revision). <https://icd.who.int/browse11/l-m/en>. Accessed 25 May 2019
27. Karatzias T et al (2019) Risk-factors and comorbidity of ICD-11 PTSD and Complex PTSD: findings from a trauma-exposed population based sample of adults in the United Kingdom. *Depress Anxiety* 36:887–894
28. Karatzias T et al (2019) Risk factors and comorbidity of ICD-11 PTSD and CPTSD in a nationally representative sample of trauma-exposed adults from the United Kingdom. *Depress Anxiety* 36(9):877–894. <https://doi.org/10.1002/da.22934>
29. Maercker A et al (2013) Diagnosis and classification of disorders specifically associated with stress: proposals for ICD-11. *World Psychiatry* 12(3):198–206. <https://doi.org/10.1002/wps.20057>
30. Osório C, et al (2018) Combat experiences and their relationship to post-traumatic stress disorder symptom clusters in UK military personnel deployed to Afghanistan. *Behav Med* 44(2):131–140. <https://doi.org/10.1080/08964289.2017.1288606>
31. MacManus D et al (2014) The mental health of the UK armed forces in the 21st century: resilience in the face of adversity. *J R Army Med Corps* 160(2):125–130. <https://doi.org/10.1136/jramc-2013-000213>
32. Iversen A et al (2007) Influence of childhood adversity on health among male UK military personnel. *Br J Psychiatry* 191:506–511
33. Hyland P et al (2017) An assessment of the construct validity of the ICD-11 proposal for complex posttraumatic stress disorder. *Psychol Trauma Theory Res Pract Policy* 9(1):1–9. <https://doi.org/10.1037/tra0000114>
34. Hyland P et al (2017) Factorial and discriminant validity of ICD-11 PTSD and CPTSD using the new International Trauma Questionnaire. *Acta Psychiatr Scand* 136:231–338
35. Karatzias T et al (2019) Psychological Interventions for ICD-11 Complex PTSD symptoms: systematic review and meta-analysis. *Psychol Med* 49:1761–1775
36. Murphy D et al (2017) Describing the profile of a population of UK veterans seeking support for mental health difficulties. *J Mental Health* 6:1–8. <https://doi.org/10.1080/09638237.2017.1385739>
37. Ben-Ezra M et al (2018) Posttraumatic stress disorder (PTSD) and complex PTSD (CPTSD) as per ICD-11 proposals: a population study in Israel. *Depress Anxiety* 35(3):264–274. <https://doi.org/10.1002/da.22723>
38. Cloitre M et al (2018) The International Trauma Questionnaire: development of a self-report measure of ICD-11 PTSD and complex PTSD. *Acta Psychiatr Scand* 138(6):536–546. <https://doi.org/10.1111/acps.12956>
39. Hyland P et al (2017) Validation of posttraumatic stress disorder (PTSD) and complex-PTSD using The International Trauma Questionnaire. *Acta Psychiatr Scand* 136(3):313–322
40. Karatzias T et al (2016) An initial psychometric assessment of an ICD-11 based measure of PTSD and complex PTSD (ICD-TQ): evidence of construct validity. *J Anxiety Disord* 44:73–79. <https://doi.org/10.1016/j.janxdis.2016.10.009>
41. Murphy D, Turgoose D (2020) Childhood adversity and mental health in veterans seeking treatment for mental health difficulties: comparisons with the general military population. *Psychol Trauma Theory Res Pract Policy*. <https://doi.org/10.1037/tra0000538>
42. Goldberg D, William P (1998) A users' guide to the General Health Questionnaire. Windsor NFER-Nelson.
43. Forbes D et al (2014) Utility of the dimensions of anger reactions-5 (DAR-5) scale as a brief anger measure. *Depress Anxiety* 31(2):166–173
44. Babor TF et al (2001) AUDIT. The alcohol use disorders identification test. Department of Mental Health and Substance Dependence, World Health Organization, Geneva
45. Mundt JC et al (2002) The Work and Social Adjustment Scale: a simple measure of impairment in functioning. *Br J Psychiatry* 180:461–464
46. Litz B et al (2009) Moral injury and moral repair in war veterans: a preliminary model and intervention strategy. *Clin Psychol Rev* 29(8):695–706

47. Currier J et al (2018) Development and evaluation of the expressions of moral injury scale-military version. *Clin Psychol Psychother* 25(3):474–488. <https://doi.org/10.1002/cpp.2170>
48. Espie C et al (2014) The sleep condition indicator: a clinical screening tool to evaluate insomnia disorder. *BMJ Open*. <https://doi.org/10.1136/bmjopen-2013-004183>
49. Carlson E, Putnam F (1993) An update on the Dissociative Experiences Scale. *Dissociation* 6:16–27
50. Williamson V et al (2019) Moral injury: violating your ethical code can damage mental health. *The conversation*. <https://theconversation.com/moral-injury-violating-your-ethical-code-can-damage-mental-health-new-research-115654>
51. Williamson V et al (2020) The impact of trauma exposure and moral injury on UK military veterans: a qualitative study. *Eur J Psychotraumatol* 11(1):1704554
52. Williamson V, Greenberg N, Murphy D (2019) Moral injury in UK armed forces veterans: a qualitative study. *Eur J Psychotraumatol*. <https://doi.org/10.1080/20008198.2018.1562842>
53. Williamson V, Greenberg N, Murphy D (2019) Impact of moral injury on the lives of UK military veterans: a pilot study. *J R Army Med Corps*. <https://doi.org/10.1136/jramc-2019-001243>
54. Murphy D, Busuttill W (2014) Reviewing PTSD, stigma and barriers to help-seeking within the UK armed forces. *J R Army Med Corps* 161(4):322–326
55. Richardson D et al (2014) Predictors of long-term treatment outcome in combat and peacekeeping veterans with military-related PTSD. *J Clin Psychiatry* 75(11):1299–1305
56. Murphy D et al (2019) Comparing the profiles of UK and Australian military veterans supported by national treatment programmes for post-traumatic stress disorder (PTSD). *J R Army Med Corps*. <https://doi.org/10.1136/jramc-2019-001268>
57. Robins L et al (1985) Early home environment and retrospective recall: a test for concordance between siblings with and without psychiatric disorders. *Am J Orthopsychiatry* 55(1):27–41
58. Wilhelm K et al (2005) The stability of the parental bonding instrument over a 20-year period. *Psychol Med* 35(3):387–393