THE UNIVERSITY *of* EDINBURGH

Complex trauma and the influence of emotional regulation and interpersonal problems: A review of Complex-PTSD and an empirical study in a prison setting

Richard Browne

Doctorate in Clinical Psychology

University of Edinburgh

March 2017

Table of contents

DClinPsychol Declaration of Own Work 4
Acknowledgements 5
Abstract 6
A systematic review of the proposed ICD-11 Complex-PTSD diagnosis 8
Abstract 9
Highlights 10
Introduction 11
Aims 15
Methods 15
Search strategy 15
Inclusion and exclusion criteria 16
Outcomes 16
Risk of bias 16
Results 17
Characteristics of included studies 17
Measurement of Trauma, PTSD and CPTSD 18
Factorial validity of the proposed ICD-11 CPTSD diagnosis 25
Is CPTSD distinct from PTSD? 27
Does CPTSD relate to prolonged interpersonal trauma? 31
How does the proposed CPTSD diagnosis relate with borderline personality disorder? 33
What are the methodological sources of bias in the existing studies? 34
Discussion 39
Factorial validity of the CPTSD diagnosis 40
Is CPTSD distinct from PTSD? 41
Is CPTSD distinct from BPD? 42
Association with interpersonal trauma 43
Limitations of the review 44
Implications for research 45
Implications for clinical practice 45
Conclusion 46
Bibliography 48

The influence of emotional regulation and interpersonal problems in the development of PTSD in a sample of male prisoners 57
Abstract 58
Introduction 59
Emotional regulation, interpersonal relationships and PTSD 59
Complex Trauma 61
Emotional regulation and interpersonal relationships in the prison population. 62
Current study 62
Methods 63
Study Design 63
Participants 63
Measures 64
Analysis 66
Results 66
Participant characteristics 66
Correlational analyses 69
Comparisons between forensic and community samples 70
Effect of sentence duration, offence type and PD screen on variables in forensic sample 71
Multiple regression analysis 73
Discussion 75
Study findings 75
Limitations 78
Implications for clinical practice 79
Conclusions 81
Bibliography 82
List of appendices 89

DClinPsychol Declaration of Own Work

Name: Richard Browne

Title of Work: Complex Trauma and the influence of emotional regulation and interpersonal relationships: A review of Complex-PTSD and empirical study in a prison setting.

I confirm that this work is my own except where indicated, and that I have:

- Read and understood the Plagiarism Rules and Regulations
- Composed and undertaken the work myself

- Clearly referenced/listed all sources as appropriate
- Referenced and put in inverted commas any quoted text of more than three words (from books, web, etc.)
- Given the sources of all pictures, data etc. that are not my own
- Not made undue use of essay(s) of any other student(s), either past or present (or where used, this has been referenced appropriately)

- Not sought or used the help of any external professional agencies for the work (or where used, this has been referenced appropriately)

- Not submitted the work for any other degree or professional qualification except as specified
- Acknowledged in appropriate places any help that I have received from others (e.g. fellow students, technicians, statisticians, external sources)
- Complied with other plagiarism criteria specified in the Programme Handbook
- I understand that any false claim for this work will be penalised in accordance with the University regulations

- Received ethical approval from the School of Health in Social Science, University of Edinburgh

  OR

- Received ethical approval from an approved external body and registered this application and confirmation of approval with the School of Health in Social Science's Ethical Committee

Signature …… **Date** ……..

Acknowledgements

Firstly, I would like to thank Angus MacBeth, for his invaluable support and input at each stage of this project. I would also like to thank Thanos Karatzias for his guidance and help throughout. This project would not have been possible without the assistance of the staff and participants in HMP Glenochil; particular thanks go to Leona Gilhooley, Liz Flynn, Rosemary Duffy and Mette Kreis. In addition, I would like to thank Kat, and my mum, for their support and patience during this process, and finally my dad – simply the best.

Abstract

Background

The effects of prolonged, interpersonal trauma have long been recognised. Such traumatic events can lead to the development of post-traumatic stress disorder (PTSD), but are also associated with a range of other psychological difficulties. The forthcoming ICD-11 has proposed the inclusion of a new diagnostic category to cover such trauma reactions, named complex-PTSD (CPTSD). CPTSD is conceptualised as including the core elements of PTSD with additional difficulties with affect regulation, self-concept, interpersonal relationships. This thesis presents a systematic review of the research into the proposed CPTSD diagnosis. In addition, this thesis investigates the association between difficulties with emotional regulation, interpersonal problems and PTSD symptoms in a group of male prisoners, and a male community sample.

Aims

This project aims to investigate whether the proposed CPTSD diagnosis accurately describes the difficulties seen following complex trauma, and examines whether it is best to view CPTSD is different from exiting disorders, including PTSD and borderline personality disorder (BPD). In addition, it aims to investigate the association between difficulties with emotional regulation, interpersonal problems and PTSD among men in prison.

Methods

We systematically assessed and synthesised the available research regarding the proposed ICD-11 CPTSD diagnosis. In the second paper, data regarding PTSD, emotional regulation, and interpersonal problems were collected from HMP Glenochil, a male-only prison in Scotland (n=51), and matched to an existing community data set (n=46).

Results

The results of the systematic review provide partial support for the factorial validity of CPTSD. In addition, they indicate that CPTSD can be conceptualised as distinct from both PTSD and BPD, and that CPTSD is more closely related to prolonged interpersonal trauma than PTSD. However, there is overlap between PTSD and CPTSD in terms of both symptomology and aetiology. The results also indicate high levels of PTSD among male prisoners. In addition, PTSD was found to be strongly associated difficulties with emotional regulation, but not interpersonal problems, in the forensic sample. In the community sample emotional regulation was a less strong predictor of PTSD symptoms, and both emotional regulation, and interpersonal problems were associated with the severity of PTSD.

Conclusions

This thesis supports the inclusion of CPTSD as a distinct diagnostic entity. Inclusion of CPTSD may allow survivors a better understanding of the aetiology of their difficulties, and may initiate research into effective ways of working with individuals who have experienced complex-trauma. I addition, they demonstrate the need for trauma-informed prison services, which prioritise the development of emotional regulation strategies in recovery and rehabilitation.

A systematic review of the proposed ICD-11 Complex-PTSD diagnosis

Richard Browne*[1], Thanos Karatzias[2], Angus MacBeth[1]

[1] Clinical and Health Psychology, University of Edinburgh, UK

[2] Rivers Centre for Traumatic Stress, NHS Lothian

Clinical and Health Psychology, University of Edinburgh, UK

*Address for correspondence:

Clinical and Health Psychology,

School of Health in Social Science,

University of Edinburgh,

Edinburgh EH8 9AG

0131 651 3969

(Email: s1475214@sms.ed.ac.uk)

Prepared for the Clinical Psychology Review

Word count: 10,505

Abstract

The negative effects of complex-trauma, particularly childhood abuse and neglect, have long been recognised. Many have suggested that the current post-traumatic stress disorder (PTSD) diagnosis does not adequately represent the range of difficulties that can be observed following such traumatic experiences. The forthcoming International Classification of Diseases-11th edition (ICD-11) has proposed the inclusion of a new diagnostic entity, complex-PTSD (CPTSD). CPTSD is conceptualised as including the core elements of PTSD (re-experiencing, avoidance and a pervasive sense of threat), with additional symptoms from three domains related to disturbances in self-organisation: poor affect regulation; negative self-concept, and difficulties with interpersonal relationships.

This PRISMA review systematically assessed and synthesised the available research evidence regarding the proposed ICD-11 CPTSD diagnosis. Four databases were used to search for papers: PsychINFO, MEDLINE, EMBASE and Google Scholar. The initial search revealed 897 papers, to which a set of inclusion and exclusion criteria were applied. Papers were included which: had a measure of ICD-11 CPTSD; recruited child or adult participants who had experienced trauma; were written in English; included either clinical or non-clinical populations; and were published between January 1980 and August 2016. Exclusion criteria were: book chapters; conference extracts; case studies; papers that only examined ICD-11 PTSD but did not include a measure of CPTSD. A total of 16 papers met inclusion and exclusion criteria.

The results of these papers provide partial evidence of the factorial validity of CPTSD, and its distinction from PTSD and borderline personality disorder (BPD). In addition, there is evidence that CPTSD is more closely associated with prolonged interpersonal trauma, than PTSD. However, there is clear overlap between PTSD and CPTSD in terms of both symptomology and aetiology. In addition, the existing papers have significant risk of bias, particularly due to the lack of a published measure of CPTSD. Results support the inclusion of CPTSD in the forthcoming ICD-11, although highlight the heterogeneity of post-traumatic reactions. Inclusion

of a CPTSD diagnosis would have global implications for clinical practice and research.

Highlights

- Some evidence that CPTSD as a distinct diagnostic entity
- Factorial validity of the proposed ICD-11 CPTSD diagnosis partially supported
- CPTSD more closely related to interpersonal trauma than PTSD
- Overlap in terms of aetiology and symptomology with PTSD and BPD

Key words: ICD-11, complex post-traumatic stress disorder, systematic review**,** diagnosis, trauma

Introduction

The effects of trauma have long been recognised (Crocq & Crocq, 2000), however post-traumatic stress disorder (PTSD) did not become a formal diagnostic entity until 1980, with the publication of the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM–III; American Psychiatric Association, 1980). The criteria for PTSD have been modified over time; however, the core features of intrusions, avoidance and arousal have remained consistent.

The forthcoming eleventh edition of the World Health Organisation International Classification of Diseases (ICD-11) has proposed arguably the most radical change to the PTSD diagnosis. Their proposal includes two related, but distinct, diagnostic entities: PTSD and complex post-traumatic stress disorder (CPTSD; Maercker et al., 2013). Proposed ICD-11 classification of PTSD state that it develops "following exposure to an extremely threatening or horrific event or series of events". Diagnostic criteria include six symptoms, in three clusters: Re-experiencing of the traumatic event (Re), through intrusive memories or nightmares which provoke a feeling of fear or horror; avoidance of traumatic reminders (Av), including both avoidance of thoughts and memories of the event, and physical reminders or situations; and a sense of current threat (Th) that manifests in hypervigilance or increased startle reaction. Symptoms must last for several weeks, and cause significant impact to functioning (Maercker et al., 2013). Proposed diagnostic criteria for CPTSD includes the presence of the core elements of PTSD, with at least one additional symptom from each of three domains related to disturbances in self-organisation (DSO): poor affect regulation (AD); negative self-concept (NSC), including the belief that one is "diminished, defeated or worthless"; and difficulties sustaining interpersonal relationships (DR; Maercker et al., 2013).

The idea that CPTSD represents a distinct syndrome was first put forward by Herman (1992). She argued that the PTSD diagnosis does not fully account for symptoms seen in those who have experienced prolonged interpersonal trauma. Stating that such complex traumatic events can lead to more complex presentations,

which include the symptoms of PTSD, and a range of additional difficulties. A number of studies have supported this perspective, indicating that prolonged interpersonal trauma can cause disturbances in a range of areas including emotional regulation, interpersonal relationships, memory and attention, self-perception, somatisation and systems of meaning (Cloitre et al., 2011; van der Kolk, Roth, Pelcovitz, Sunday, & Spinazzola, 2005). These studies guided the selection of domains of self-organisation for the ICD-11 CPTSD diagnosis. Complex trauma is also related to significant difficulties in functional domains including employment and parenting (Cloitre, Miranda, Stovall-McClough, & Han, 2005).

The proposed aetiology of CPTSD has been developed since Herman's initial conceptualisation. In line with Courtois' conceptualisation (2004), ICD-11 suggests that although CPTSD typically follows prolonged interpersonal traumas, the type of trauma experienced is not a determinant of the diagnosis (Maercker et al., 2013). A better understanding of the factors that influence the development of post-traumatic reactions could enable clearer classification, and influence research into treatment and early intervention strategies. Furthermore, this underscores the importance of interpersonal factors within the conceptualisation of the CPTSD construct.

A guiding principle in classification development must be clinical utility: diagnoses should be consistent with clinician's mental health taxonomies, have a limited number of symptoms, and provide distinctions that are important for management and treatment (Reed, 2011). The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; American Psychiatric Association [APA], 2013) considered including a CPTSD category. However, it was not included due to a lack of evidence, questions over its clinical utility and its distinction from borderline personality disorder (BPD; Friedman, Resick, Bryant, & Brewin, 2011). Instead, DSM-5 added two additional symptoms in criteria D and E related to negative self-concept and affect regulation, which resemble elements of the ICD-11 CPTSD domains.

There is debate around whether categorical diagnostic systems adequately capture the complexity and structure of mental health difficulties, or whether they should be replaced with dimensional systems (Haslam, 2003). DSM has traditionally used a

categorical approach, however, the publication of DSM-5 spurred debate as to the relative merits of dimensional and categorical approaches. Providing support for a dimensional system in the case of PTSD, Ruscio, Ruscio and Keane (2002) examined combat veterans and found that PTSD appeared to represent the top end of a continuum of anxiety and stress, rather than a discrete disorder. However, there are potential problems with the application of a dimensional system. It could make the process of diagnosis additionally complex and potentially cause confusion for patients. In addition, it is currently unclear how best to develop a fully dimensional system, and the premature application of such a system could lead to variation in the information that patients receive (Frances, 2009). Ultimately, both DSM-5 and ICD have opted for "hybrid" systems, maintaining diagnostic categories, but including dimensional measures within these (DSM-5; American Psychiatric Association [APA], 2013).

The addition of CPTSD as a diagnostic category would have a significant impact and several advantages. Complex trauma is an under researched area, in part due to the lack of a universal definition of what constitutes complex trauma. Some have categorised complex trauma using various sets of symptoms; while others have defined complex trauma as a type of traumatic experience (Landy, Wagner, Brown-Bowers, & Monson, 2015). Diagnostic categories provide the basis for research into the treatment of disorders, which in turn allows clinicians a better understanding of how to work with individuals and improves outcomes for patients. However, the addition of a CPTSD diagnosis would also represent a significant divergence between ICD and DSM, which could cause confusion for clinicians and patients.

Some people have questioned whether CPTSD represents a new diagnosis, or whether it is better conceptualised as PTSD with comorbid borderline personality disorder (BPD; e.g. Driessen et al., 2002). Proponents of this position note the overlap in symptomology observed in the two diagnoses, stating that PTSD and BPD diagnoses are sufficient to capture clinical presentation seen in CPTSD (e.g. Landy, et al., 2015). They argue that a system with PTSD, CPTSD and BPD is less parsimonious that the current DSM-5 categories. Those who believe that the two disorders are distinct cite evidence that although 81% to 91% of those with BPD report traumatic experiences (Herman, Perry, & van der Kolk, 1989), 9% to 19% do

not, and that there is only a small to moderate effect size for the association between childhood sexual abuse and BPD (Fossati, Madeddu, & Maffei, 1999). Others argue that although the two disorders are not distinct, the term complex trauma would be more accurate, less stigmatising and would provide an aetiology for the symptoms experienced in BPD (Lewis & Grenyer, 2009). The debate highlights the complexity of diagnosis in the mental health field, the overlap in psychiatric diagnoses, and the role of trauma in a range of mental health difficulties (e.g. Morrison; Frame & Larkin, 2003; Golier et al., 2003; Zanarini Williams, Lewis, & Reich., 1997; Watson et al., 2013)

Cloitre, Garvert, Brewin, Bryant, & Maercker (2013) were the first to empirically investigate the proposed ICD-11 CPTSD diagnosis. They used latent profile analysis (LPA) with 302 participants who had experienced a range of traumatic events. In line with ICD-11 proposals they found a three-class solution best fitted the data; with a PTSD class, a CPTSD class and a low symptom class. They also found that prolonged trauma was more closely related to CPTSD than PTSD, and single incident trauma was more closely related to PTSD than CPTSD. However, there are some limitations of this work, which shall be discussed later. A number of studies have now investigated ICD-11 CPTSD focusing on its measurement, factorial and discriminant validity, risk factors, and presence in diverse groups.

Landy et al. (2015) conducted a narrative review of the evidence for a complex trauma diagnosis. They state that a clear definition of CPTSD is required. However, they dispute the evidence for CPTSD as a distinct disorder, and conclude that the current DSM-5 system adequately accounts for the proposed criteria for CPTSD. Landy et al. cite the latent profile analysis by Cloitre et al. (2013) as an example of the high quality taxometric research which is required to elucidate the nature of CPTSD. However, they do not include a number of other papers which use similar methodology (e.g. Cloitre, Garvert, Weiss, Carlson & Bryant, 2014; Knefel & Lueger-Schuster, 2013; Knefel, Garvert, Cloitre & Lueger-Schuster, 2014; Elklit, Hyland & Shevlin, 2014). In addition, a number of relevant papers have been published since the time of Landy et al.'s review.

With the publication of the ICD-11 set for 2018, a number of studies have been conducted which examine the proposed CPTSD diagnosis in terms of its factorial validity, its overlap with other disorders, its aetiology and measurement. As yet, no review has synthesised the available evidence. Such a review is timely as it should influence debate around CPTSD as a diagnostic category, and the decision whether to include it in ICD-11.

Aims

This paper aims to identify, summarise and critically evaluate articles that have investigated the ICD-11 CPTSD diagnosis. Specifically, the following research questions were asked:

i) How is C-PTSD measured?
ii) What is the factorial structure of the CPTSD diagnosis?
iii) Is C-PTSD a distinct diagnosis from PTSD?
iv) Does C-PTSD associate with prolonged interpersonal trauma?
v) What are the methodological sources of bias in the existing studies?

Methods

A systematic review of the literature around ICD-11 CPTSD was carried out using PRISMA criteria.

Search strategy

A systematic search was carried out according to PRISMA guidelines (Moher, Liberati, Tezalaff, Altman, & Prisma Group, 2009). The following electronic databases were included PsychINFO (1980-2016), MEDLINE (1980-2016), EMBASE (1980-2016) and Google Scholar (2013-2016; see Appendix C).

The search terms used were (CPTSD) or (complex post-traumatic stress disorder) or (complex PTSD) combined with (ICD-11) or (International Classification of Diseases). A manual search of relevant journals was conducted and the references of papers were reviewed for further papers. Duplicates were removed and titles and abstracts reviewed to check their relevance. Inclusion and exclusion criteria were applied to the remaining papers (see Figure 1 for flow chart of literature search).

Inclusion and exclusion criteria

Inclusion criteria were (i) a measure of ICD-11 CPTSD; (ii) child or adult participants; (iii) participants who had experienced trauma; (iv) written in English; (v) including either clinical or non-clinical populations; (vi) utilising either qualitative or quantitative designs; (vi) published between January 1980 and August 2016.

Exclusion criteria were (i) book chapters; (ii) conference extracts; (iii) case studies; (iv) papers that only examined ICD-11 PTSD and did not include CPTSD (i.e. had a measure of Re, Av and Th, but not AD, NSC and DR).

In order to qualify as having a measure of ICD-11, papers were required to measure all of the key factors of the ICD-11 diagnosis: re-experiencing, avoidance, sense of threat, difficulties with affect regulation, negative self-concept and difficulties with interpersonal relationships. As there is no published measure of ICD-11 CPTSD, papers measured this in a range of ways. Papers were permitted to use items from existing measures, or develop their own measure, so long as it had face validity for measuring ICD-11 CPTSD criteria. If a paper measured CPTSD using factors other than those in the ICD-11 criteria then it was excluded for the purposes of the main analysis in order to provide a clear assessment of the proposed ICD-11 diagnosis.

Outcomes

Outcomes were defined as the presence or absence of symptom profiles consistent with PTSD and CPTSD in individuals following exposure to a traumatic event. This was assessed using validated measures, and clinical interview. CPTSD was measured using the newly developed ICD-11 trauma questionnaire (ICD-TQ; Cloitre, Roberts, Bisson, & Brewin, in preparation) or using items from existing measures.

Risk of bias

The risk of bias in individual papers was assessed using a bespoke proforma based on the Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (National Heart, Lung and Blood Institute, 2014). Four items were added to this covering the modelling techniques, the use of a BPD measure and the inclusion of individuals with type I and type II traumas (see Appendix D). Potential sources of bias were assessed. A random sample of 30% of the studies were rated by a second

individual who was blind to the aims of the review. There was 81% agreement on criteria, and any discrepancies were discussed and reassessed.

Results

Characteristics of included studies

In total 16 papers met inclusion criteria. Cloitre, Garvert, Brewin, Bryant, and Maercker (2013); Cloitre, Garvert, Weiss, Carlson, and Bryant (2014); Dokkedah, Oboke, Ovuga, and Elklit (2015); Ekjkit, Hyland, and Shevlin (2014) Feiszli (2015); Hyland et al. (2016); Karatzias et al. (2016); Karatzias et al. (2016); Knefel and Lueger-Schuster (2013); Knefel, Garvert, Cloitre, and Lueger-Schuster (2014); Knefel, Tran, and Lueger-Schuster (2016); Murphy, Elklit, Dokkedah, and Shevlin (2016); Perkonigg et al (2015); Sacher, Keller and Goldbeck (2016); Tay, Rees, Chen, Kareth, and Silove (2015); Wolf et al. (2015). These papers are summarised in Table 1.

The 16 papers analysed data from 13 cohorts, with a total N=5737. Based on the data from 12 cohorts, 57.3% were female, no data about gender was given for one study (Perkonigg et al., 2015; n = 640). The average age taken from 12 cohorts was approximately 36.7 years old (range 7 – 87). Only four cohorts provided data regarding employment status (Cloitre et al., 2013; Cloitre et al., 2014; Karatzias et al., 2016, 2017; Knefel et al., 2016). Five cohorts gave information on educational attainment (Cloitre et al., 2013; Cloitre et al., 2014; Karatzias et al., 2016, 2017; Knefel et al., 2013; Knefel et al., 2016).

All studies used convenience sampling. Five studies sampled from specialist trauma centres (Cloitre et al., 2013; Cloitre et al., 2014; Hyland et al., 2016; Karatzias et al., 2016; Karatzias et al., 2017); three studies used the same sample of survivors of institutional abuse (Knefel & Lueger-Schuster, 2013; Knefel et al., 2014; Knefel et al., 2016); one sample came from an outpatient mental health clinic (Sacher et al., 2016); one used a community sample (Perkonigg et al., 2015); one used an online sample of undergraduates (Feiszli, 2015); one study used a combination of an online community sample, and a sample of veterans recruited via an existing database (Wolf et al., 2015); and one study recruited three samples - bereaved parents from the Danish ‘National association of Infant Death’, sexual assault survivors from a

specialist trauma centre, and physical assault survivors from an emergency ward (Elklit et al. 2014).

All studies used adult samples other than one (Sacher et al., 2016) which used a sample of children and adolescents. Three studies used data from non-Western samples, from Northern Uganda (Dokkedah et al., 2015, Murphy et al., 2016) and West Papua New Guinea (Tay et al., 2015). Of the 16 included papers all used cross-sectional designs.

Karatzias et al. (2016) and Karatzias et al. (2017) both used the same sample; as did Knefel and Lueger-Schuster (2013) and Knefel et al. (2014); and Dokkedah et al (2015) and Murphy et al (2016). It is acknowledged that this has the potential to inflate the results. However, in all three cases the sample was used for two different types of analyses, and so contribute to different aspects of the results of this review, which should mitigate this effect. In addition, the demographics of each sample were only counted once, so as not to inflate the overall N of the review.

Measurement of Trauma, PTSD and CPTSD

Trauma exposure was measured using a range of questionnaires, most commonly: The Life Events Checklist (LEC; Gray Litzm, Hsu, & Lombardo, 2005) (Karatzias et al., 2016; Karatzias et al., 2017; Murphy et al., 2016); The Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998) (Feiszli, 2015; Karatzias et al., 2016; Karatzias et al., 2017; Knefel et al., 2016;); UNICEF War Trauma Screening Scale (Dokkedah et al., 2015; Murphy et al., 2016); Life Stressor Checklist-Revised (LSC-R; Wolfe & Kimerling, 1997) (Cloitre et al., 2013); Detailed Assessment of Posttraumatic Stress (DAPS; Briere, 2001) (Feiszli, 2015); The Clinician-administered PTSD Scale for Children (CAPS-CA; Steil & Fuchsel, 2006) (Sacher et al., 2016); The Munich-Composite International Diagnostic Interview (MINI; Wittchen & Pfister, 1997) (Perkonigg et al., 2015); and the National Stressful Events Survey (NSES; Kilpatrick, Resnick, Baber, Guille, & Gros, 2011) (Wolf et al., 2015). Some studies measured trauma exposure using clinical interview (Hyland et al., 2016; Knefel & Lueger-Schuster, 2013; Knefel et al., 2014) or developed their own measure (Tay et al., 2015). One did not report how trauma exposure was measured (Cloitre et al., 2014).

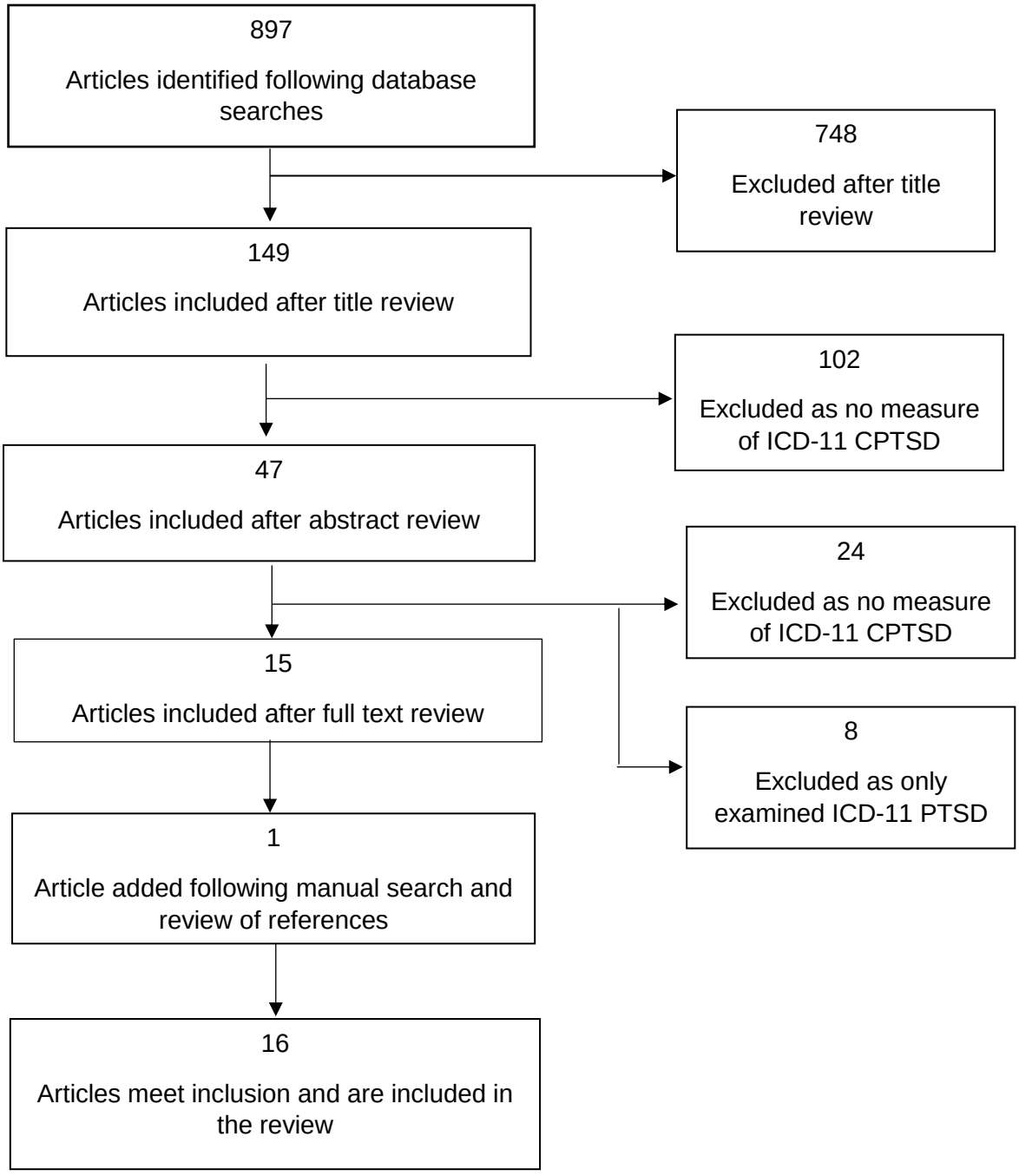

Figure 1. Flow chart of literature search

Table 1. Summary of included studies

Study	N	Age (years)	Gender (female – male)	Exposure measure	CPTSD measure(s)	Main analysis	Results
Cloitre et al. (2013)	388	39.57 (SD = 11.53)	89.1% -10.9%	LEC, LSC-R	MPSS-SR, BSI	CFA / LPA	Results supported the ICD-11 factorial structure of CPTSD. Three-class model found to be best fit: PTSD, CPTSD and low symptom classes. Inclusion or exclusion of those with BPD did not alter the model fit. Interpersonal trauma associated more with CPTSD than PTSD.
Cloitre et al.(2014)	280	37.13 (SD = 10.86)	100% female	Not reported	CAPS, BSI	LCA	Four-class model found to be best fit: PTSD, CPTSD, BPD and low symptom classes. No association between interpersonal trauma and CPTSD, other than for CSA.
Dokkedah et al.(2015)	314	22.4 (SD = 2.60)	51% - 49%	UNICEF war screening scale	ICD-TQ, MINI	Correlations, ANOVA, Chi-square	ICD-TQ found to have adequate convergent and discriminant validity. However, no significant association between PTSD as measured by the ICD-TQ and the MINI.
Elklit et al. (2014)	1251	29.43 (SD = 5.85)	65.1% - 34.9%	Not reported	HTQ-IV, TSC	LCA	Three class model found to be best fit in three diverse samples PTSD, CPTSD, low symptom classes. Prevalence of CPTSD found to be highest among survivors of sexual assault, then physical assault then bereaved parents.
Feiszli (2015)	717	20.23 (SD = 2.48)	72.9% - 27.1%	CTQ, DAPS	PCL-5, IASC, BDI-II	LCA	Four-class model found to be best fit: PTSD, CPTSD, dissociative and low symptom classes.

							No association between interpersonal trauma and CPTSD, other than for emotional abuse.
Hyland et al. (2016)	453	57.95 (SD = 9.54)	86% - 14%	Clinical interview	HTQ-IV, TSC	CFA	Results supported the ICD-11 factorial structure of CPTSD, although correlated six-factor model also good fit. Higher levels of CSA association with PTSD but not CPTSD
Karatzias et al. (2016)	193	41 (SD = 12.40)	65.1% - 34.9%	CTQ, LEC	ICD-TQ, PCL-5, DERS, RSES, IIP-32	CFA	Results supported the ICD-11 factorial structure of CPTSD.
Karatzias et al. (2017)	Same sample as Karatzias et al. (2016)			CTQ, LEC	ICD-TQ	LCA	Two-class model found to be best fit: PTSD and CPTSD classes. Interpersonal trauma associated more with CPTSD than PTSD
Knefel & Lueger-Schuster (2013)	229	55.8 (SD = 9.8)	22.7% - 77.3%	Clinical interview	PCL-5, BSI	CFA	Results supported the ICD-11 factorial structure of CPTSD. Interpersonal trauma associated more with CPTSD than PTSD
Knefel et al. (2014)	Same sample as Knefel & Lueger-Schuster (2013)			Clinical interview	PCL-5, BSI	LPA	Four-class solution found to be best fit: PTSD, CPTSD, low symptom and DSO classes.
Knefel et al. (2016)	219	57.95 (SD = 9.54)	40.2% - 59.8%	CTQ, LEC-5	ICD-TQ		

						Network analysis	PTSD and DSO symptoms quite densely connected, but association within PTSD symptoms and within DSO symptoms stronger than between them. BPD symptoms not highly associated with PTSD or DSO symptoms.
Murphy et al. (2016)	Same sample as Dokkedah et al. (2015)			UNICEF war screening scale	ICD-TQ	LCA	Three-class model best fit to the data: PTSD, CPTSD and low symptom classes. Interpersonal trauma associated more with CPTSD than PTSD
Perknoigg et al. (2015)	640	Not reported	Not reported	M-CIDI PTSD module	SCL-90-R	LCA	Four-class solution found to be best fit: PTSD, CPTSD, low symptom and DSO classes.
Sachser et al. (2016)	155	13.01 (SD = 2.83)	72.3% - 27.7%	CAPS-CA	UCLA-PTSD-RI, CAPS-CA	LCA	Two-class model found to be best fit: PTSD and CPTSD classes. Childhood interpersonal trauma associated more with CPTSD than PTSD.
Tay et al. (2015)	230	37 (SD 9.80)	40.5% - 50.5%	Items developed by researchers	Items developed by researchers	CFA	Results indicated that a correlated six-factor model was the best fit - ICD-11 factorial structure not supported. No association between childhood trauma and CPTSD.
Wolf et al. (2015)	668	44 (veteran sample only, SD not reported)	39% - 61% (veteran sample) 78.8% - 21.8%	NSES	NSES	FMM	Hybrid dimensional / categorical model best fit the data: four-classes differing in terms of severity, but not PTSD / CPTSD diagnosis.

Note: BSI, Brief Symptom Inventory; CFA, confirmatory factor analysis; DERS, Difficulties in Emotion Regulation Scale; CAPS-CA, Clinician-administered PTSD Scale for Children and Adolescents; CTQ, The Childhood Trauma Questionnaire; DAPS, Detailed Assessment of Posttraumatic Stress; FMM, factor mixed modelling; HTQ-IV, Harvard Trauma Questionnaire Part 4; ICD-TQ, International Classification of Diseases Trauma Questionnaire; IIP-32, Inventory of Interpersonal Problems – 32 item scale; LEC-5, The Life Events Checklist; LPA, latent profile analysis; LCA, latent class analysis, LSC-R, Life Stressor Checklist-Revised; M-CIDI PTSD module, The Munich-Composite International Diagnostic Interview; MINI, Mini International Neuropsychiatric Interview; MPSS-SR, Modified PTSD Symptom Scale; PCL-5, PTSD Checklist for DSM-5; NSES, National Stressful Events Survey; RSES, Rosenberg Self-esteem Scale, SCL-90-R , Symptom Checklist-90-R; TSC, Trauma Symptom Checklist, UCLA-PTSD-RI, University of California PTSD Reaction Index

To measure PTSD and CPTSD symptoms five studies used the newly developed ICD-TQ (ICD-TQ; Cloitre et al, in preparation) (Dokkedah et al., 2015; Karatzias et al., 2016; Karatzias et al., 2017; Knefel et al., 2016; Murphy et al., 2016). Karatzias et al. (2016) investigated the factorial structure of the ICD-TQ. This study gave support for the ICD-11 conceptualisation of CPTSD, and indicated that the ICD-TQ was able to adequately capture the factorial structure of CPTSD (see factorial validity section below for more detail). Internal reliability of the subscales ranged from 0.72 to 0.95 and results indicated good convergent and discriminant validity. However, Karatzias et al. (2016) recommend that the pool of items be refined, due to low factor loadings, particularly for emotional regulation.

Dokkedah et al. (2015) investigated the psychometrics of a translated version on the ICD-TQ in a Ugandan sample. This study indicated that the ICD-TQ adequate convergent and discriminant validity. However, they found no significant association between PTSD as measured by the ICD-TQ and the Mini International Neuropsychiatric Interview (M.I.N.I; χ^2 (1, n = 61) = 1.63, p = .2, phi = .2). The Kappa measure of agreement was .2 (p = .12). This disparity may be due the M.I.N.I's requirement for a traumatic experience to have been responded to with 'fear helplessness, or horror', which is not a requirement for ICD-11 PTSD. Many of the participants identified traumatic experiences, but a significant number (17.5%) did not report responding to it with fear helplessness, or horror.

As the ICD-TQ scale was recently developed, most studies published to date have artificially created measures of PTSD and DSO using items or subscales from existing questionnaires namely: The PTSD Checklist (PCL-5; Weathers et al., 2013) (Feiszli, 2015; Karatzias et al., 2016; Knefel & Lueger-Schuster, 2013; Knefel et al., 2014); the Brief Symptom Inventory (Derogatis, & Melisaratos, 1983) (Cloitre et al., 2013; Cloitre et al., 2014; Knefel & Lueger-Schuster, 2013; Knefel et al., 2014); the Modified PTSD Symptom Scale (MPSS-SR; Falsetti, Resnick, Resick, & Kilpatrick, 1993) (Cloitre et al., 2013); the Civilian Administered PTSD Scale for DSM-IV (CAPS; Weathers, Keane & Davidson, 2001) (Cloitre et al., 2014); the Harvard Trauma Questionnaire Part 4 (HTQ-IV; Mollica et al., 1992) (Elklit et al. 2014; Hyland et al., 2016); the Trauma Symptom Checklist (TSC; Briere & Runtz, 1989)

(Elklit et al. 2014; Hyland et al., 2016); the Symptom Checklist-90-R (SCL-90-R; Derogatis, 1986) and the MINI (Perkonigg et al., 2015); the UCLA PTSD Reaction Index for DSM-IV (Steinberg et al., 2001) and the CAPS-CA (Sacher et al., 2016); and the NSES (Wolf et al., 2015). One study (Tay et al., 2015) created a culturally adapted measure of PTSD and CPTSD symptoms with items based on DSM-5 and ICD-11 criteria.

Factorial validity of the proposed ICD-11 CPTSD diagnosis

Five studies investigated the factorial structure of the proposed CPTSD construct using confirmatory factor analysis (Cloitre et al., 2013; Hyland et al., 2016; Karatzias et al., 2016; Knefel & Lueger-Schuster, 2013; Tay et al., 2015). Two studies (Cloitre et al., 2013; Knefel & Lueger-Schuster, 2013) conceptualised CPTSD as consisting of four factors: a PTSD factor, and three DSO factors: AD, NSC and DR. Evidence for the ICD-11 conceptualisation requires a good model fit, and for the DSO factors to be more closely correlated to each other, than they are to the PTSD factor.

Cloitre et al. (2013) found the four-factor model of CPTSD was a good fit, with the comparative fit index (CFI) Tucker-Lewis fit index (TLI) and root mean-square error of approximation (RMSEA) all in excellent ranges (CFI = .97, TLI = .96, and RMSEA = .05 (90% CI: .03, .07); see Appendix E an for explanation of fit indexes). They found that the DSO factors had strong correlations (r = .82 - .88). However, the DSO factors also had moderate to strong correlations with the PTSD factor (r = .44 - .80). Knefel et al. (2014) replicated this analysis and also found that the four factor model had an excellent fit (Appendix F.1). In their analysis the DSO factors had moderate correlations both with each other (r = .42 - .52) and with the PTSD factor (r = .45 - .49).

To investigate the factorial structure further three studies (Hyland et al., 2016; Karatzias et al., 2016; Tay et al., 2015) compared a range of possible factorial models. They tested a more in-depth model of the ICD-11 CPTSD diagnosis. CPTSD was conceptualised as consisting of two second order factors (PTSD and DSO), which account for the covariance among the six first order factors. With Re, Av and Th loading onto the PTSD factor, and AD, NSC and DR loading onto the DSO factor.

Hyland et al. (2016) investigated the fit of four models, and found two that adequately fit the data. The proposed ICD-11 factor structure was found to be a good fit (appendix F.2). With Re, Av and Th loading strongly onto the PTSD factor (r = .75 - .85), and AD NSC and DR loading strongly onto the DSO factor (r = .78 - .93). In addition, PTSD and DSO factors were also strongly correlated (r = .81, p < .001). However, they also found that a six-factor model was an adequate fit. With items loading onto six correlated factors (Re, Av, Th, AD, NSC and DR) but no higher order latent factor. They conclude that the ICD-11 model as the best fit due to a lower Bayesian information criterion (BIC) and better parsimony and theoretical consistency.

Karatzias et al. (2016) conducted a psychometric assessment of the newly developed ICD-TQ, and in the process tested the validity of a range of factorial models. They tested the same models as Hyland and also added three other possible configurations. Their results replicated those of Hyland with both the ICD-11 model and the correlated six-factor model providing an acceptable fit (appendix F.3) With no significant difference between the two models ($\Delta\chi^2 = 10.605$, $\Delta df = 8$, p=0.225). However, they selected the ICD-11 model as superior based on parsimony, and theoretical consistency. In the ICD-11 model Re, Av and Th loaded strongly onto the PTSD factor (r = .71 - .86), and AD, NSC and DR loaded strongly on to the DSO factor (r = .80 - .96). PTSD and DSO factors were also strongly correlated (.75, p < .05).

Tay et al. (2015) also tested the factorial structure of CPTSD they found that a six-factor model was a good fit (Appendix F.4). However, they found that the second-order factor model was not a good fit of the data, as the chi-square was significant. Thus the symptom clusters were heterogeneous, and did not form a unitary underlying construct representing CPTSD.

Overall, these results give some support for the factorial validity of the CPTSD diagnosis. However, results are inconsistent, and indicate that a correlated six-factor model also fits the data, with no latent DSO or CPTSD factor.

Is CPTSD distinct from PTSD?

Of fundamental importance in considering if CPTSD is a valid diagnosis is whether it is distinct from the existing PTSD diagnosis. Seven studies used latent class analysis (LCA) to investigate this question (Cloitre et al., 2014; Elklit et al. 2014; Feiszli, 2015; Karatzias et al., 2017; Murphy et al., 2016; Perkonigg et al., 2015; Sacher et al., 2016). Three studies used latent profile analysis (LPA; Cloitre et al., 2013; Feiszli, 2015; Knefel et al., 2014). One study evaluated dimensional, categorical and hybrid models using factor mixed modelling (Wolf et al., 2015) and one study used a network analysis to investigate the associations between CPTSD, PTSD and BPD symptoms (Knefel et al., 2016; see Appendix E for details of these tests and fit indices).

The majority of studies revealed classes which appeared to represent the ICD-11 conceptualisation of PTSD and CPTSD. Cloitre et al. (2013) investigated the fit of models consisting of two-through to six-classes. Only the two class and the three-class models had significant Lo-Mendell-Rubin-adjusted likelihood ratio test (LMR-A) and Bootstrapped likelihood ratio (BLRT) results ($p < 0.05$). However, the three-class model had a lower BIC value, indicating that it was a better fit of the data (Appendix F.5). This model consisted of a class with high levels of PTSD symptoms but low levels of DSO symptoms, labelled 'PTSD'; a class with high levels of both PTSD and DSO symptoms, labelled 'CPTSD'; and a class with low scores across both symptom clusters, labelled 'low symptom'.

Murphy et al. (2016) replicated the findings of Cloitre et al. (2013), with a three-class solution best fitting the data. Again, the LMR-A and BLRT were only significant for the two and three-class solutions. Akaike's information criterion (AIC), BIC and sample size adjusted BIC (ssaBIC) were all lowest for a three-class solution indicating this was the best fit (Appendix F.6). Elklit et al. (2014) found a three-class model was the best fit, across three trauma exposed samples: bereaved parents, sexual assault survivors, and physical assault survivors. In the samples of bereaved parents and victims of sexual assault the BIC was lowest for the three-class solution, and the LMRA-LRT value became non-significant at the four-class solution (Appendix F.7 & F.8). In the sample of victims of physical assault the BIC was lowest for the three-class model (Appendix F.9). The LMRA-LRT was only significant for a two-

class solution, however the probability was only marginally greater (0.05) for the three-class solution, and the three-class model had a lower AIC, indicating that it is the best fit.

Two studies (Karatzias et al., 2017; Sacher et al., 2016) found that a two-class model was the best fit. Karatzias et al. (2017) investigated the fit of one- through to six-class models. The two-class model had the lowest BIC (appendix F.10). The likelihood ratio test (LRT) became non-significant for the three-class solution. The three-class solution had the lowest AIC and ssaBIC, although the difference was small. They conclude that the two-class solution was the best fit of the data, on due to the lower BIC and it being more parsimonious. Sachaer et al. (2016) examined the ICD-11 CPTSD in a sample of children and adolescents. They found that the two-class model was the only one to have a significant LMRA-LRT and BLRT value ($p < .001$) and the lowest BIC value (Appendix F.11) Examination of the classes in both of these studies indicated that classes appear to represent PTSD and CPTSD. Both used trauma-exposed, treatment seeking, samples, which likely explains the lack of a low symptom class.

A number of studies found that a four-class solution best fit the data (Knefel et al., 2014; Perkonigg et al., 2015; Cloitre et al., 2014; Feiszli, 2015). Each found classes representing PTSD, CPTSD and low symptoms, and an additional class. Knefel et al. (2014) selected a four-class solution at the best fit, as it had a significant BLRT ($p < .0001$) result and the lowest BIC value, although it did not have a significant LMR-A value ($p = .05351$; Appendix F.12). Examination of the classes revealed CPTSD, PTSD and low symptom classes, and in addition a class which scored high on DSO symptoms, but low on PTSD. Perkonigg et al. (2015) found a similar result with the AIC, BIC and ssaBIC all smallest for the four-class solution, which included a DSO class (Appendix F.13). These two studies indicate a group of individuals who develop difficulties with AD, NSC and DR, without significant PTSD symptoms.

Cloitre et al. (2014) performed an LCA and included a measure of BPD. In their analyses the two-class model has a significant LMR-A ($p < 0.05$) and BLRT result ($p < .001$). The three and four-class models had a significant BLRT result ($p < .001$) but non-significant LRM-A results (Appendix F.14) The three-class model had the lowest

BIC. However, the four class model was chosen as the best fit, on the basis that it was the model with the largest number of classes that had a significant BLRT, and the lowest ssaBIC and AIC values. Classes appeared to represent a PTSD class, a CPTSD class, a low symptom class and a BPD class, which supports the conceptualisation of CPTSD as distinct from BPD. Feiszli (2015) also found a four-class solution best fit the data. The three-and four-class solutions were the best fit to the data (Appendix F.15). Both had significant BLRT values, the three-class solution had a significant LRM-A *p*-value, however the four-class solution had a lower BIC. The five- and six-class solutions had the lowest BIC, however they contained small, and hard to interpret groups. Examination of the classes revealed a PTSD class, a CPTSD class, a low symptom class and a dissociative class, which scored high for dissociation, but low on PTSD and DSO symptoms. These papers (Knefel et al., 2014; Perkonigg et al., 2015; Cloitre et al., 2014; Feiszli, 2015) give some support to the conceptualisation of CPTSD as a distinct diagnosis. However, the discovery of additional classes of individuals hints at the complexity of post-traumatic reactions, and indicates that there are groups of symptoms, or difficulties, not accounted for by the proposed CPTSD diagnosis.

Wolf et al. (2015) used fixed factor modelling (FFM) in order to compare and combine CFA and LPA. FFM allows for comparison of dimensional, categorical and hybrid models. They tested the model fit with a community sample, and a sample of veterans, analysing both samples separately, but finding comparable results. In the community sample they tested FFMs with two to four factors, combined with one or two variables. They found that a hybrid dimensional / categorical model best fit the data. Like the papers investigating factorial structure, they found evidence of two latent factors with Re, Av and Th loading on to the PTSD factor, and AD, NSC and DR loading on to the DSO factor (standardised β ranged from .63 to .86, $p < .001$). They also found evidence of four classes, which differed in terms of severity, ranging from high to low, but not in terms of endorsement of PTSD or CPTSD items. This model had the lowest BIC of all models tested (Appendix F16). PTSD and CPTSD factors were correlated ($r = .56$, $p < .001$). They found a very similar result in the veteran sample. Again they found that a hybrid dimensional / categorical model best fit the data, with four-classes differing in levels of severity and two latent variables

(one reflecting the dimensionality of the PTSD items, and the other the dimensionality of the CPTSD items. Like the community sample, the PTSD and CPTSD factors were correlated across the classes (r = .70, $p < .001$). These results do not support CPSTD as distinct from PTSD. They indicate that individuals differ in their overall symptom severity but not in terms of PTSD and DSO symptomology.

Knefel et al. (2016) analysed data using a network analytic approach. The network approach views disorders as resulting from the causal interplay between symptoms, rather than the presence of underlying disease classes (Kendler, Zachar & Craver, 2011). Knefel et al. entered items representing the key symptoms of PTSD, CPTSD and BPD into their analysis to investigate the interconnectedness of these symptoms both within, and between, disorders. The density (which is represented by the number of non-zero edges in relation to all possible edges) was 0.86 within the PTSD items, 0.53 within the DSO items and 0.17 within the BPD items. Between PTSD and DSO it was 0.32, between PTSD and BPD it was 0.05, and between DSO and BPD it was 0.08. PTSD symptoms were more densely connected than either the DSO symptoms, or the BPD symptoms (χ^2 (1) = 6.67, $p = 0.009$; χ^2 (1) = 23.19, $p < 0.001$; respectively). In addition, the density of the DSO symptoms was significantly higher than the density of the BPD symptoms (χ^2 (1) = 13.00, $p < 0.001$). Modularity analysis showed that the PTSD symptoms were grouped together with two DSO dissociation symptoms (depersonalisation and derealisation), and three symptoms of affect dysregulation (emotional vulnerability, heightened emotional reactivity and long-time upset). The four negative self-concept symptoms formed a separate group with two symptoms of affect dysregulation (emotional numbing and inability experiencing positive emotions), two interpersonal difficulties symptoms (avoidance of relationships and difficulty feeling close to others) and one BPD symptom (unstable interpersonal relationships). The other two affect dysregulation symptoms (anger and reckless behaviour) clustered with an interpersonal difficulties symptom (feeling distant or cut-off from others) and a BPD symptom (identity disturbance), while the other seven BPD symptoms formed three small groups.

Overall, these results provide some support for the distinction of CPTSD from PTSD, using a variety of analytical modelling strategies. They also indicate that this

distinction exists across groups of individuals with different index-traumas. However, there is also evidence that groups may differ in terms of severity rather than diagnosis (Wolf et al, 2015). In addition, there is evidence that the CPTSD diagnosis may fail to capture the full constellation of symptoms which can occur following traumatic experiences.

Does CPTSD relate to prolonged interpersonal trauma?

As previously discussed, CPTSD is conceptualised as being more commonly associated with prolonged interpersonal trauma than PTSD (Maercker et al., 2013); although it is acknowledged that CPTSD and PTSD reactions can occur following a range of traumatic events. Many of the studies examined the association between the type of trauma experienced and PTSD / CPTSD class membership.

A number of studies found that individuals in the CPTSD class were likely to have experienced higher levels of interpersonal traumas than those in the PTSD class (Cloitre et al., 2013; Karatzias et al., 2017; Knefel & Lueger-Schuster, 2013; Murphy et al., 2016; Sacher et al., 2016). Cloitre et al. (2013) found that endorsement of childhood trauma as the worst trauma was a significant predictor of CPTSD as opposed to PTSD (χ^2 (1) = 5.23, p = 0.022). The odds ratio showed that those who selected childhood trauma as their worst trauma were twice as likely to have CPTSD compared to PTSD (OR = 2.11, 95% CI: 1.11, 3.99). In addition, selection of 9/11 exposure as the worst trauma was a significant predictor of PTSD class membership (χ^2 (1) = 13.56, p < .001). Karatzias et al. (2017) found that higher rates of childhood trauma were predicative of being in the CPTSD class (χ^2 (1) = 25.21, p < .001) as were higher numbers of life-time traumatic events (χ^2 (1) = 14.01, p < .001).

Elklit et al. (2014) investigated PTSD and CPTSD among three groups of trauma exposed individuals. They found that sexual assault survivors were the most likely to endorse CPTSD (20.7%); followed by physical assault survivors (13%); and bereaved parents (10.4%). This provides some evidence of the association between interpersonal trauma, and CPTSD. However, in each sample the proportion of individuals with PTSD was higher than that with CPTSD. The proportion of individuals who had experienced prolonged interpersonal trauma in each sample is

also unclear, as neither types of assault, nor the trauma histories of participants are reported.

Knefel et al. (2013) examined differences between CPTSD and PTSD groups in terms of duration of exposure to traumatic events. They found no main effect ($F(2, 221) = 48.46$, $p = 0.085$). However, the more powerful planned contrasts test indicated that the CPTSD class had longer durations of exposure in comparison to the PTSD group ($t(221) = 2.23$, $p = 0.027$). Similarly, Murphy et al. (2016) found that the mean number of traumatic experiences was higher in the CPTSD class than the PTSD class (F (2, 313) = 30.39, $p < .05$). Likewise, Sachser et al. (2016) found significantly higher rates of interpersonal trauma among those in the CPTSD group than those in the PTSD group (χ^2 (1) = 6.18, $p = .013$).

However, not all studies found this association between CPTSD and interpersonal trauma. Cloitre et al. (2014) found no significant differences between PTSD, CPTSD, low symptom and BPD classes in terms of the number of traumas or trauma type, other than rates of childhood sexual assault (CSA), which were significantly higher in the CPTSD class than BPD or low symptom classes ($p = .003$) but not the PTSD class. Similarly, Feiszli (2015) found that rates of emotional abuse were significantly higher in the CPTSD class than the PTSD class ($t = -2.19$, $p < .05$), while there were no significant differences between groups in terms of rates of physical abuse, sexual abuse, emotional neglect and physical neglect.

Furthermore, two studies found no association between type of childhood trauma and PTSD and CPTSD groups. Tay et al. (2015) did not find any association, however they acknowledge that the measure used to assess childhood trauma was limited in scope. In their community sample, Wolf et al. (2015) found no significant differences between those who met criteria for ICD-11 CPTSD, and PTSD, on reported physical trauma history (χ^2 (1) = 0.75, $p = .51$), sexual trauma history (χ^2 (1) = 0.07, $p = .84$), or total number of traumatic experiences (t (64) = -1.036, $p = .30$). Similarly, in their veterans sample those diagnosed with PTSD and CPTSD did not differ in terms of their exposure for pre-military physical or sexual assault, military sexual trauma, or post military physical or sexual assault (χ^2 (1) = 0.003, $p = .96$). Finally, Hyland (2016) found that experiencing six or more sexual abuse acts during childhood was a

weak predictor of PTSD symptoms (β = .16, $p < .009$) but was not significantly associated with DSO symptoms. Overall, there does appear to be some association between CPTSD and prolonged interpersonal trauma. However, there is an overlap in the aetiology of PTSD and CPTSD, and both presentations can follow interpersonal or single-event traumas.

How does the proposed CPTSD diagnosis relate with borderline personality disorder?

The identified studies also highlight the question to what degree CPTSD can be represented as PTSD with BPD (Landy et al., 2015). Three studies explicitly examined this question. Cloitre et al. (2013) repeated the LPA both with and without the inclusion of individuals who met criteria for BPD. In both analyses, a three-class model provided the best fit to the data. Of those with a BPD diagnosis, 33.7% were classified as being in the CPTSD class, 15.0% in the PTSD class and 11.9% in the low symptom class. Thus, the inclusion or exclusion of those with BPD did not significantly alter the model fit, and individuals with BPD were found in each class.

In order to further explore this question, Cloitre et al. (2014) included items relating to the symptoms of BPD in an LPA of women who have experienced abuse in childhood. They found that the three-class model had the lowest BIC (Appendix F.14). However, the four-class model had a significant and reliable BLRT result, the lowest ssaBIC and the lowest AIC. Classes appeared to represent a PTSD class; a low symptom class (both with low scores across the BPD items); a CPTSD class (with high endorsement of PTSD and DSO symptoms, and low endorsement of BPD items other than 'feelings of emptiness'); and a BPD class. It is of note that the BPD class was characterised by high endorsement of BPD symptoms, and also scored highly for both PTSD and CPTSD symptoms. As outlined above, Knefel et al. (2016) used a network analytic approach and investigated the relationship between PTSD, CPTSD and BPD symptoms. This analysis found that CPTSD symptoms were related to one another, however CPTSD and BPD symptoms were not strongly related; indicating that BPD symptoms do not play a strong role in the CPTSD construct.

Overall, the results of these three studies results provide some support for the distinction between CPTSD and BPD. Individuals were identified that score highly for CPTSD, but not for BPD (Cloitre et al., 2014), and the network analysis (Knefel

et al., 2016) did not find strong associations between CPTSD and BPD symptoms. However, individuals classified as BPD in Cloitre et al.'s (2014) study also scored highly for PTSD and DSO symptoms; this appears to represent a group of individuals with a significant overlap in BPD and CPTSD symptoms.

What are the methodological sources of bias in the existing studies?

Risk of bias was assessed using an adapted version of the quality assessment tool for observational cohort and cross-sectional studies (National, Heart, Lung and Blood Institute). Methodology scores are displayed in table 3.

A major source of bias existed in that all papers were cross-sectional. As both trauma exposure and CPTSD / PTSD symptoms were measured at the same time point, it is not possible to infer that the observed symptoms followed the trauma exposure. However, this is a problem inherent in trauma research.

None of the studies performed a power analysis, or provided justification for their sample size. This is likely in part due to the difficulty in estimating required sample size for LPA and LCA, and also the lack of robust studies in the field to estimate effect sizes. There is a range of evidence and guidance regarding the minimum sample size required for Confirmatory Factor Analysis. Some recommend a minimum of 100 participants (e.g. MacCallum et al., 1999; Gorsuch, 1983). Hutcheson and Sofroniou recommend 150-300 participants. Others recommend a ratio of 20 participants for each variable (Hogarty et al., 2005). All studies in this review had a sample size larger than n=150. So it appears that the studies using CFA had adequate samples. It has been estimated that sample size required for Latent Class Analysis for a three-class model, assuming a medium effect size, is n=290 (Dziak, et al., 2014). A number studies that carried out LPA / LCA had sample sizes smaller than this (Cloitre et al., 2014; Hyland et al, 2016, Knefel & Lueger-Schuster, 2013; Perknoigg et al., 2015). However, most studies used robust samples.

As discussed previously, CPTSD is conceptualised as being more closely related to prolonged interpersonal trauma (type II trauma) and PTSD as being more closely related to single traumatic events (type I trauma). A number studies made an attempt at classifying people as having experienced type I and II trauma (Cloitre et al., 2013; Cloitre et al., 2014; Karatzias et al., 2016; Karatzias et al., 2017; Sacher et al., 2016).

However, in Cloitre et al.'s studies (2013, 2014) many individuals reported experiencing both type I and type II trauma, and participants were asked to choose what their worst trauma was, making it harder to draw conclusions about the effects of the type of trauma. In the studies by Karatzias et al. (2016, 2017) a large percentage of individuals had experienced childhood abuse, and only a very small percentage reported exposure to a single traumatic event (6.2% and 4.6% respectively). In addition, in one study by Karatzias et al. (2016) they did not investigate the effect of the trauma type on the results of the factor analysis. Sachser et al.'s (2016) sample consisted of children and adolescents, the majority (76.8%) had experienced interpersonal trauma, and the remaining individuals (23.2%) had experienced exposure to an "accidental" traumatic event.

Murphy et al. (2016) divided individuals into those who had been abducted, and those who had not. Unsurprisingly, former abductees had higher numbers of traumatic experiences and were more likely to be in the CPTSD class; however, they did not investigate the effect of different types of trauma on class membership. Dokkedah et al. (2015) used the same sample, and did investigate the effect of different trauma types. The paper by Elklit et al. (2014) used three samples, sexual assault survivors, physical assault survivors and bereaved parents. Sexual assault survivors reported the highest rates of CPTSD. However, they did not report the prevalence of prolonged interpersonal trauma in these samples, preventing a full analysis of the effect of type I and type II traumas.

Table 3 Risk of bias assessment for individual papers

Author year	Clear research question?	Clear study population?	Participation rate ≥ 50%	Recruitment from same population – eligibility criteria	Sample size justification?	Exposure measures prior to outcome?	Timeframe between exposure and outcome	Different levels of exposure?	Exposure measures valid, reliable?	Exposure assessed more than once?	Outcome measures valid, reliable?	Blinding	Drop out at follow-up	Confounding variables measured / adjusted for?	Appropriate statistical method?	Range of models?	BPD measure?	Definitions between type I and II trauma?
Cloitre et al. (2013)	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Partial	No	Not applicable	Yes	Yes	Yes	Yes	Partial
Cloitre et al. (2014)	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Partial	No	Not applicable	Yes	Yes	Yes	Yes	Partial
Dokkedah et al. (2015)	Yes	Yes	Yes	Yes	No	No	Yes	Partial	Partial	No	No	No	Not applicable	Yes	Yes	Not applicable	No	No
Elklit et al. (2014)	Yes	Yes	Not reported	No	No	No	Yes	Yes	Not reported	No	Partial	No	Not applicable	No	Yes	Yes	No	Partial
Feiszli (2015)	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Partial	No	Not applicable	No	Yes	Partial	No	No
Hyland et al. (2016)	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Not reported	No	Partial	No	Not applicable	Yes	Yes	Partial	No	No
Karatzias et al. (2016)	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	No	Yes	No	Not applicable	No	Yes	Partial	No	Partial
Karatzias et al. (2017)	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	No	Not applicable	Yes	Yes	Yes	No	Partial
Knefel & Lueger-Schuster (2013)	Yes	Yes	No	Yes	No	No	Yes	Yes	Not reported	No	Partial	Not applicable	Not applicable	Yes	Yes	Yes	No	No

Knefel et al. (2014)	Yes	Yes	No	Yes	No	No	Yes	No	Not reported	No	Partial	No	Not applicable	Yes	Yes	Yes	No	No
Knefel et al. (2016)	Yes	Yes	No	Yes	No	No	Yes	No	Yes	No	Yes	No	Not applicable	No	Yes	Not applicable	Yes	Not applicable
Murphy et al. (2016)	Yes	Yes	Yes	Yes	No	No	Yes	Partial	Partial	No	Yes	No	Not applicable	Yes	Yes	Yes	No	No
Perkonigg et al, (2015)	Yes	Yes	Not reported	No	No	No	Yes	Yes	Yes	No	Partial	No	Not applicable	Yes	Yes	Yes	No	No
Sachser et al. (2016)	Yes	Yes	Not reported	Yes	No	No	Yes	Yes	Yes	No	Partial	No	Not applicable	Yes	Yes	Yes	NA	Partial
Tay et al. (2015)	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Partial	No	No	No	Not applicable	Yes	Yes	Yes	No	No
Wolf et al. (2015)	Yes	Yes	Yes	No	No	No	Yes	Yes	Partial	No	No	No	Not applicable	Yes	Yes	Yes	No	No

The remaining samples were either made up of individuals who both experienced type I and type II traumas (Feiszli, 2015; Perkonigg et al., 2015; Tay et al., 2015; Wolf et al., 2015) or all type II (Hyland et al., 2016; Knefel & Lueger-Schuster, 2013; Knefel et al., 2014; Knefel et al., 2016). Of these papers some investigated whether a higher rate of type II trauma increased your likelihood of being in the CPTSD class (Feiszli, 2015; Hyland et al., 2016; Knefel & Lueger-Schuster, 2013; Perkonigg et al., 2015), but none included the effects of experiencing type I trauma. Some did not investigate the effect of trauma type (Knefel et al., 2014; Knefel et al., 2016). In addition, most of the class / profile analysis studies did not include a measure of BPD (Feiszli, 2015; Karatzias et al., 2017; Murphy et al., 2016; Perkonigg et al., 2015; Sacher et al., 2016; Knefel et al., 2014). This makes it difficult to determine how many of individuals in the CPTSD class would be adequately described by the existing BPD and PTSD diagnoses.

Papers used a variety of measures of trauma exposure. A number used validated measures (Cloitre et al., 2013; Feiszli, 2015; Karatzias et al., 2016; Karatzias et al., 2017; Knefel et al., 2016; Perkonigg et al., 2015; Sacher et al., 2016; Wolf et al., 2015). Others relied on information given at clinical interview Hyland et al., 2016; Knefel & Lueger-Schuster, 2013; Knefel et al., 2014). Some translated existing measures Cloitre et al., 2014; 1 Murphy et al., 2016; Murphy et al., 2016). Two did not report how they measured trauma exposure (Cloitre et al., 2014; Elklit et al., 2014).

As the ICD-TQ is recently developed many, of the papers were required to use items from measures to represent the CPTSD and PTSD factors (Cloitre et al., 2013; Cloitre et al., 2014; Elklit et al., 2014; Hyland et al., 2016; Knefel & Lueger-Schuster, 2013; Knefel et al., 2014; Perkonigg et al., 2015; Sacher et al., 2016; Wolf et al., 2015). Feiszli (2015) used a mixture of item scores and subscale scores. Tay et al. (2015) developed items due to the lack of a translated measure. Dokkedah et al. (2015) and Murphy et al. (2016) used items from a measure which they translated into the local language. The psychometrics of the translated versions have not been established.

The items to represent CPTSD constructs generally had adequate face validity. However, there is an issue with the items used by Wolf et al. (2015) to represent negative self-concept. In the ICD-11 conceptualisation negative self-concept is seen as consistently low. However, all the items used by Wolf et al., begin “Have you ever had a persistent pattern of…”. In addition, the items

used to measure negative self-concept centre more on interpersonal relationships and do not ask about feelings of worthlessness or guilt. More generally, there is an issue with using measure items, as these have not been shown to be valid and reliable measures of the CPTSD factors. The majority of papers measured confounding variables, for example age, marital status, education level. However, some papers did not (Elklit et al., 2014; Feiszli, 2015; Karatzias et al., 2016; and Knefel et al., 2016).

Although all papers gave a range of relevant fit indices, choosing the best fitting model can have a degree of subjectivity. Karatzias et al. (2016) and Hyland et al. (2016) looked into the fit of a range of factorial models. Both found little difference between the factorial structure proposed by ICD-11 and a correlated six-factor model, but chose the ICD-11 model mainly on the basis of parsimony and theoretical consistency.

Discussion

The current review aimed to systematically assess and synthesise the available research evidence regarding the proposed ICD-11 CPTSD diagnosis. It explored CPTSD in terms of its measurement; factorial validity; distinction from existing diagnoses; and relation to interpersonal trauma. The results provide support for the conceptualisation of CPTSD and PTSD as distinct diagnostic entities. With CPTSD including the core symptoms of PTSD, i.e. re-experiencing, avoidance and a sense of threat; and additional symptoms of poor affect regulation, negative self-concept, and problems with interpersonal relationships. In line with Courtois' conceptualisation (2004), CPTSD was found to be more closely related to prolonged interpersonal trauma than PTSD. However, it is clear that the two disorders overlap to some degree in terms of symptomology and aetiology. The review also finds evidence that CPTSD is distinct from BPD, and thus not best conceptualised as PTSD with comorbid BPD. These results support the inclusion of CPTSD in ICD-11, and have significant implications future research and clinical work.

With regard to the first research question on measurement of CPTSD, it was apparent that many of the studies used items from existing measures to represent CPTSD (Cloitre et al., 2013; Cloitre et al., 2014; Elklit et al., 2014; Feiszli, 2015; Hyland et al., 2016; Knefel & Lueger-Schuster, 2013; Knefel et al., 2014; Perkonigg et al., 2015; 1 Sacher et al., 2016; Tay et al., 2015). The range of measures and items used creates significant heterogeneity in the

measurement of CPTSD across studies. Such bespoke measures have not been shown to be valid or reliable measures of CPTSD, and may introduce bias into the results.

The accuracy of CPTSD measurement will be improved with the publication of the new ICD-TQ (Cloitre et al., in preparation). The ICD-TQ was used in a number of the studies in this review (Cloitre et al., in preparation; Dokkedah et al., 2015; Karatzias et al., 2016; Karatzias et al., 2017; Knefel et al., 2016; Murphy et al., 2016). Karatzias et al. (2016) tested the psychometrics of the ICD-TQ, and found it adequately captured the factorial structure of CPTSD. It has also been found to have good convergent and discriminant validity in UK and Ugandan samples (Dokkedah et al., 2015; Karatzias et al., 2016). However, the ability of the ICD-TQ to distinguish between PTSD, CPTSD and a range of other post-traumatic reactions, e.g. depression has yet to be established. The validation of the ICD-TQ in groups with different trauma exposures, from different sociocultural backgrounds, is important to provide an accurate measure of CPTSD, and to promote research in the field.

Factorial validity of the CPTSD diagnosis

The results of the review provide partial support for the factorial validity of ICD-11 CPTSD. Four studies found evidence of the proposed factorial structure of CPTSD (Cloitre et al., 2013; Hyland et al., 2016; Karatzias et al., 2016; Knefel & Lueger-Schuster, 2013). However, two of these compared a range of models (Hyland et al., 2016; Karatzias et al., 2016), and found that correlated six-factor model was also a good fit. Another study, Tay et al. (2015) found that a correlated six-factor model was a good fit, but did not find evidence of a unitary higher order 'CPTSD' factor. The six-factor model includes Re, Av, Th, AD, NSC and DR as correlated factors, which do not load on to any higher order latent structure. In addition, all studies found a strong association between PTSD and DSO factors, which further brings in to question the conceptualisation of CPTSD as a distinct from PTSD.

It is of note that the participants in Tay et al.'s (2015) study were West Papuan refugees, which may indicate cultural limitations of the CPTSD diagnosis. The other papers to examine CPTSD in non-Western samples (Murphy et al., 2016; Dokkedah et al., 2015), found evidence of CPTSD presentations. However, there is evidence of cultural differences in the presentation of PTSD (Marshall, Schell, & Miles, 2009), and there have been calls to develop a more encompassing view of trauma that takes into account the range of difficulties seen in countries affected by

political violence, and other interpersonal trauma (Pedersen, Tremblay, Errázuriz, & Gamarra, 2008). The inclusion of CPTSD as a diagnostic entity may provide us with this opportunity, therefore it is important to continue to evaluate whether it adequately captures the effects of complex-trauma across cultures.

Is CPTSD distinct from PTSD?

The results of this review support the conceptualisation of CPTSD as distinct from PTSD (Maercker et al., 2013). Most studies found evidence of distinct classes of individuals with PTSD and CPTSD symptomology (Cloitre et al., 2013; Cloitre et al., 2014; Elklit et al., 2014; Feiszli, 2015; Karatzias et al., 2017; Knefel et al., 2014; Murphy et al., 2016; Perkonigg et al., 2015; Sacher et al., 2016). In addition, this distinction was found among diverse samples of traumatised individuals, including those who had experienced childhood trauma, institutional abuse, physical assault, sexual assaults, abduction and the death of a child (Cloitre et al., 2013; Cloitre et al., 2014; Elklit et al., 2014; Knefel et al., 2014; Murphy et al., 2016).

In addition to PTSD and CPTSD a number of studies found evidence of additional classes in their sample. Four studies' analyses included a low symptom class (Cloitre et al., 2013; Cloitre et al., 2014; Feiszli, 2015; Murphy et al., 2016) highlighting the fact that many individuals who experience trauma, do not go on to develop symptoms (Bonanno, 2004).

Knefel et al. (2014) and Perkonigg et al. (2015) included a DSO class, indicating that some individuals may develop difficulties with emotion regulation, interpersonal relationships and self-concept, but without PTSD symptomology. How much these difficulties are related to trauma, and how far they could be explained by other existing diagnoses may provide important areas for future research. Finally, Feiszli (2015) found evidence of a dissociative class, with high levels of dissociation, but low PTSD and DSO symptoms. The emergence of additional classes of individuals hints at the range and complexity of post-traumatic reactions. If the CPTSD diagnosis is introduced it will be important for clinicians and researchers to keep in mind the far-reaching effects of complex trauma.

Knefel et al. (2016) used a network analytic approach, and found that PTSD and DSO symptoms were more strongly associated within factors than between, however, there was also a high degree of association between factors, and PTSD and DSO symptoms did not cluster in distinct groups. Their research highlights the complex interplay of symptoms, and provides partial

support for CPTSD as a distinct diagnostic entity. One study did not support the distinction between PTSD and CPTSD (Wolf et al., 2015). It found that a hybrid categorical / dimensional model was the best fit, with two latent variables (PTSD and CPTSD) and four classes, which different in terms of severity, rather than PTSD or CPTSD diagnosis. Their work highlights the importance of including dimensional modelling into analysis, and generally point towards the benefits of more sophisticated statistical modelling. Overall, the results of this review provide preliminary evidence that CPTSD is a distinct disorder.

Is CPTSD distinct from BPD?

Contrary to conclusions of Landy et al. (2015) this review provides evidence that CPTSD is distinct from BPD, and indicates that CPTSD is not best conceptualised as PTSD with comorbid BPD. The studies by Cloitre et al. (2013; 2014) found that latent classes remained stable with, or without, individuals with BPD, and a further LPA found evidence of distinct CPTSD, BPD, PTSD and low symptom classes. However, the BPD class in this analysis also demonstrated high levels of PTSD and DSO symptoms. This indicates a group of individuals with high levels of symptomology, for whom the distinction between PTSD, CPTSD and BPD is less well defined. Knefel et al. (2016) did not find a strong relationship between BPD symptoms and DSO or PTSD symptoms, and BPD symptoms did not appear to play a significant role in either disorder.

In comparison to CPTSD, BPD appears to be characterised by higher rates of self-harm, impulsivity and fear of abandonment, in addition to a fluctuating, rather than stable and negative, sense-of-self (Cloitre et al., 2014; Knefel et al., 2016). Chronic feelings of emptiness appear to be common in both BPD and CPTSD (Cloitre et al., 2014; Knefel et al., 2016). The different constellations of symptoms seen in CPTSD and BPD indicate the need for different treatment approaches. Traditionally, BPD treatment focuses on reducing self-injurious behaviours, creating an integrated and stable sense-of-self, and reducing dependence on others (Linehan, 1993). The International Society for Traumatic Stress Studies (ISTSS) published treatment guidelines for CPTSD, which recommend a phase-based model (Cloitre et al., 2012). Phase 1 focuses on safety and stabilisation through reducing risk to self and others, improving emotional regulation and developing an understanding about the nature of trauma. Phase 2 involves processing the memories of traumatic experiences, through the review and reappraisal of traumatic experiences. In phase 3 patients are supported to reintegrate with important aspect of their life and social networks. Jongh et al. (2016) argue that the evidence for a phased-based model is limited, and

highlight that the current research employs heterogenous samples, limiting its generalisability. They question the necessity of a safety and stabilisation stage and contend that traditional exposure based therapies may be sufficient for the treatment of CPTSD. This debate highlights the need for high quality research in the field. The inclusion of CPTSD as a diagnostic entity would stimulate research, and increase our understanding of how best to work with individuals with CPTSD.

Association with interpersonal trauma

Herman initially conceptualised CPTSD as related to interpersonal trauma (1992). Courtois (2004) contends that, although CPTSD is more closely associated with interpersonal trauma, it can follow a range of types of trauma, including single-events. The results of this review provide some evidence of an association between interpersonal trauma and CPTSD. Five studies found higher rates of interpersonal trauma in the CPTSD class than the PTSD class (Cloitre et al., 2013; Elklit et al., 2014; Karatzias et al., 2017; Knefel & Lueger-Schuster, 2013; Murphy et al., 2016; Sacher et al., 2016). However, as Courtois highlights, a range of types of trauma were found to be associated with CPTSD. Two studies in the review found evidence of higher rates of childhood sexual abuse (Cloitre et al., 2014) and emotional abuse (Feiszli, 2015) in the CPTSD class, but no overall effect of trauma type on class membership. Two further studies found no association between interpersonal trauma and CPTSD (Tay et al., 2015; Wolf et al., 2015). Finally, one paper found that higher rates of interpersonal trauma were actually associated with PTSD, but not DSO symptoms (Hyland et al., 2016). Kendell (2002) highlights the importance of aetiology in determining the validity of psychiatric diagnoses. A clear distinction in the aetiology of PTSD and CPTSD would provide support for them as separate diagnostic entities. However, the results of this review demonstrate overlap in the aetiology of PTSD and CPTSD, reflecting the current lack of consensus regarding the area.

In addition, these findings highlight the heterogeneous nature of post-traumatic reactions. Type II trauma has been linked to many psychological factors including shame, guilt, dissociation, somatization and self-harm (Dorahy et al., 2013; Mina & Gallop, 1998; Van der Kolk, Pelcovitz, Roth & Mandel, 1996). How well the proposed CPTSD diagnosis incorporates such symptomology is not yet established. Most papers in this review used only two items to measure each DSO factor, which limits the scope of CPTSD. The publication of the ICD-TQ should overcome some of these difficulties, as the items cover a wider range of CPTSD symptoms,

including dissociation, worthlessness, shame and guilt. However, the degree to which this encompasses the constellation of difficulties seen following trauma remains to be seen. It is important that in the attempt to classify CPTSD we do not become reductive, and that we continue to develop our understanding of the range of trauma related phenomenology, and its role in mental health difficulties.

Limitations of the review

A number of important weaknesses were identified in the studies. All papers were cross-sectional meaning it is not possible to infer a causal relationship between traumatic experiences and the observed symptoms. Although all used fairly robust samples, no studies provided a power analysis. The majority of the studies used items from existing measures to represent CPTSD, although these mainly had adequate face validity it is not possible to determine whether they are reliable and valid measures of CPTSD. Of those studies that classified trauma, many did not have clear boundaries between individuals who had experienced type I and type II trauma (Cloitre et al., 2013; Cloitre et al., 2014; Elklit et al., 2014; Sacher et al., 2016); others had very small numbers who had experienced type I trauma (Karatzias et al., 2016; Karatzias et al., 2017); some only included individuals who had experienced type II (Hyland et al., 2016; Knefel & Lueger-Schuster, 2013; Knefel et al., 2014; Knefel et al., 2016), others did not investigate the effect of experiencing type I trauma (Feiszli, 2015; Perkonigg et al., 2015; Tay et al., 2015; Wolf et al., 2015) or did not examine the effect of trauma type at all (Knefel et al., 2014; Knefel et al., 2016). This makes it difficult to analyse the effect of the type of trauma on symptomology. Only three studies included a measure of BPD (Cloitre et al., 2013; Cloitre et al., 2014; Knefel et al., 2016), which limits the conclusions that can be made about the relationship between BPD and CPTSD.

The results of this review should be viewed in the context of its strengths and weaknesses. A major strength of the paper was that it used a systematic search strategy. Included studies were all independently checked for bias by two independent researchers**.** Limitations include the fact that the 16 studies came from 13 cohorts; therefore although this has been taken into account, it has the potential to inflate the overall results of the review. A further limitation is that the risk of bias assessment tool used has not been validated. Finally, historically complex trauma has been defined and measured in different ways. Papers have been published which define complex trauma using sets of symptoms which do not correspond with the ICD-11 conceptualisation, and

others which define complex trauma through its aetiology, rather than symptomology. This review chose to examine the evidence around ICD-11 CPTSD, and therefore only included papers which met with ICD-11 conceptualisation of CPTSD.

Implications for research

The results of this review highlight a number of avenues for future research. The forthcoming publication of the ICD-TQ will allow valid measurement of CPTSD, and assist further class and profile analyses. Future studies should examine the fit of categorical, dimensional and hybrid models of CPTSD. In addition, studies using more complex modelling techniques such as network analytic approaches (Borsboom & Cramer, 2013) may provide a more in-depth understanding of the interplay of symptoms that can follow traumatic experiences. Finally, given the overlap in aetiology, further research should examine the relationship between interpersonal trauma, how individuals make sense of it, and the development of PTSD, CPTSD and BPD symptomology.

Implications for clinical practice

This review adds to the growing literature around the proposed ICD-11 CPTSD diagnosis. Determining diagnostic categories is a complex process and distinct boundaries between disorders are rare (Klein & Riso, 1993; Lobo, & Agius, 2012). Kendell (2002) states that key factors in judging the validity of a psychiatric diagnosis are predictive power and clinical utility; a diagnosis should indicate specific treatment options and potential outcomes. The ISTSS guidelines promote the use of a phase based model in the treatment of CPTSD; focusing on safety and stabilisation, trauma processing and reintegration (Cloitre et al., 2012). This model includes the processing element typically associated with PTSD treatment, but also focuses on attachment, relationships difficulties and emotional regulation. Studies have demonstrated that this can be an effective treatment for CPTSD (Cloitre et al., 2003; Cloitre et al., 2011*;* Steil et al., 2011). Only one study (Cloitre et al., 2010) has compared phase-based treatment with exposure-based and skills-focused treatments for CPTSD; it found that phase-based treatment was significantly more effective. This provides further evidence of the discriminant validity of the CPTSD diagnosis. One study included in this review (Sachser et al., 2016) investigated the effectiveness of phase-based, trauma-focused CBT for children and adolescents with CPTSD and PTSD. Both groups showed significant improvement, with large effect sizes. Groups had parallel

treatment trajectories, which differed only in that the CPTSD group had higher pre- and post-values.

The Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM–5; American Psychiatric Association, 2013) considered including a CPTSD category. The decision not to include CPTSD was reportedly due to a lack of evidence at the time, and questions over its clinical utility and distinction from BPD (Friedman et al., 2011). However, DSM-5 PTSD did include a new criteria "negative alterations in cognitions and mood", with items covering: negative beliefs about oneself; negative trauma-related emotions; and alienation from others, which resemble the ICD-11 CPTSD criteria to some degree. The results of this review support the distinction of CPTSD and PTSD, dispute the DSM-5 conceptualistion and provide support for the ICD-11 proposals.

Some may query the rationale for developing a CPTSD diagnosis at all, and it is worth posing the question: are we in danger of oversimplifying complex trauma? Evidence continues to emerge of the role of childhood abuse and neglect in a range of mental health difficulties, including psychosis (Morrison et al., 2003); bipolar disorder (Watson et al., 2013); and personality difficulties (Golier et al., 2003; Zanarini et al., 1997). Perhaps it is time for radical overhaul of the diagnostic system. Some have called for a move away from discrete diagnostic categories, to a dimensional approach, citing a lack of genetic evidence for discrete disorders (Cuthbert & Insel, 2010). However, the best way to develop and apply a dimensional diagnostic system is currently unclear, and premature application of such a system could lead to wide variation in the information that patients receive (Frances, 2009). Perhaps diagnostic criteria should be seen as a helpful heuristic. A way of quickly imparting information, particularly between professionals. However, this should not negate the opportunity for an individualised, developmental formulation, which promotes understanding of the aetiology, and adaptive nature, of a person's difficulties.

Conclusion

The results of this add to the evidence for the inclusion of CPTSD as a diagnostic entity. There is evidence of the factorial validity of CPTSD, and its distinction from PTSD and BPD. However, there is clear overlap between PTSD and CPTSD in terms of both symptomology and aetiology. Diagnostic categories are rarely clearly defined, and there is large overlap between many existing

diagnoses. Diagnostic manuals have been criticised for growing ever larger, and trying to artificially "carve nature at its joints". It is also important not to lose sight of the purpose of diagnosis; to allow clinicians and patients a clearer understanding of symptoms, and indicate the best treatment strategies. It is the view of the authors that a CPTSD diagnosis would allow survivors a better understanding of the root of their difficulties, which is often the first step to recovery. It would also encourage research into ways of working with individuals who have survived some of life's most difficult experiences.

Bibliography

American Psychiatric Association (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed). Washington DC: Author.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed). Arlington, VA: Author.

Bernstein, D.P., Fink, L., 1998. Childhood Trauma Questionnaire. A Retrospective Self-report. Manual. San Antonio, TX: The Psycho- logical Corporation. The Psychological Corporation, Harcourt Brace & Company, San Antonio, TX.

Bonanno, G. A. (2004). Loss, trauma, and human resilience: have we underestimated the human capacity to thrive after extremely aversive events?. *American psychologist*, *59*(1), 20.

Borsboom, D., & Cramer, A. O. (2013). Network analysis: an integrative approach to the structure of psychopathology. *Annual review of clinical psychology*, *9*, 91-121.

Briere, J. (2001). *Detailed Assessment of Posttraumatic Stress Disorder professional manual*. Odessa, FL: Psychological Assessment Resources.

Briere, J., & Runtz, M. (1989). The Trauma Symptom Checklist (TSC-33) early data on a new scale. *Journal of interpersonal violence*, *4*(2), 151-163.

Cloitre, M., Courtois, C. A., Charuvastra, A., Carapezza, R., Stolbach, B. C., & Green, B. L. (2012). Treatment of complex PTSD: Results of the ISTSS expert clinician survey on best practices. *Journal of traumatic stress*, *24*(6), 615-627.

Cloitre, M., Koenen, K. C., Cohen, L. R., & Han, H. (2002). Skills training in affective and interpersonal regulation followed by exposure: a phase-based treatment for PTSD related to childhood abuse. *Journal of consulting and clinical psychology*, *70*(5), 1067.

Cloitre, M., Garvert, D. W., Brewin, C. R., Bryant, R. A., & Maercker, A. (2013). Evidence for proposed ICD-11 PTSD and complex PTSD: A latent profile analysis. *European Journal of Psychotraumatology, 4*, 20706.

Cloitre, M., Garvert, D. W., Weiss, B., Carlson, E. B., & Bryant, R. A. (2014). Distinguishing PTSD, Complex PTSD, and Borderline Personality Disorder: A latent class analysis. *European journal of psychotraumatology*, *5*.

Cloitre, M., Miranda, R., Stovall-McClough, K. C., & Han, H. (2005). Beyond PTSD: Emotion regulation and interpersonal problems as predictors of functional impairment in survivors of childhood abuse. *Behavior Therapy*, *36*(2), 119-124.

Cloitre, M., Stovall-McClough, K. C., Nooner, K., Zorbas, P., Cherry, S., Jackson, C. L., ... & Petkova, E. (2010). Treatment for PTSD related to childhood abuse: A randomized controlled trial. *American journal of psychiatry*, *167*(8), 915-924.

Cloitre, M., Roberts, N.P., Bisson, J.I., & Brewin, C.R. (in preparation). The ICD-11Trauma Questionnaire (ICD-TQ). Unpublished Measure.

Courtois, C. C. (2004). Complex Trauma, complex reactions: Assessment and treatment, *Psychotherapy: Theory, Research, Practice, Training*, 2004, Vol 41(4), 412-425.

Crocq, M. A., & Crocq, L. (2000). From shell shock and war neurosis to posttraumatic stress disorder: a history of psychotraumatology. *Dialogues in clinical neuroscience*, *2*(1), 47-55.

Cuthbert, B. N., & Insel, T. R. (2010). Toward new approaches to psychotic disorders: the NIMH Research Domain Criteria project.

Derogatis LR (1986) SCL-90-R. Self-report symptom inventory. In: Collegium internationale psychiatriae scalaru M (eds) *Internationale Skalen für Psychiatrie*. Beltz, Weinheim

Derogatis, L. R., & Melisaratos, N. (1983). The brief symptom inventory: an introductory report. *Psychological medicine*, *13*(03), 595-605.

Dorahy, M. J., Corry, M., Shannon, M., Webb, K., McDermott, B., Ryan, M., & Dyer, K. F. (2013). Complex trauma and intimate relationships: The impact of shame, guilt and dissociation. *Journal of affective disorders*, *147*(1), 72-79.

Dokkedah, S., Oboke, H., Ovuga, E., & Elklit, A. (2015). ICD-11 Trauma Questionnaires for PTSD and Complex PTSD: Validation among Civilians and Former Abducted Children in Northern Uganda. *Journal of Psychiatry*, *2015*.

Driessen, M., Beblo, T., Reddemann, L., Rau, H., Lange, W., Silva, A., ... & Ratzka, S. (2002). Is the borderline personality disorder a complex post-traumatic stress disorder?-The state of research. *Der Nervenarzt*, *73*(9), 820-829.

Dziak, J. J., Lanza, S. T., & Tan, X. (2014). Effect Size, Statistical Power, and Sample Size Requirements for the Bootstrap Likelihood Ratio Test in Latent Class Analysis. *Structural equation modeling: a multidisciplinary journal*, *21*(4), 534-552.

Elklit, A., Hyland, P. & Shevlin, M. (2014). Evidence of symptom profiles consistent with posttraumatic stress disorder and complex posttraumatic stress disorder in different trauma samples. *European Journal of Psychotraumatology*, *5*, 24221.

Falsetti, S. A., Resnick, H. S., Resick, P. A., & Kilpatrick, D. G. (1993). The Modified PTSD Symptom Scale: A brief self-report measure of posttraumatic stress disorder. *Behaviour Therapist*, *16*, 161-161.

Feiszli, K. R. (2015). *Classic and Complex Posttraumatic Stress Disorder: A Latent Profile Analysis* (Doctoral dissertation, Auburn University).

Frances, A. (2009). Whither DSM–V?. *The British Journal of Psychiatry*, *195*(5), 391-392.

Friedman, M. J., Resick, P. A., Bryant, R. A., & Brewin, C. R. (2011). Considering PTSD for DSM-5. *Depression and anxiety*, *28*(9), 750-769.

Fossati, A., Madeddu, F., & Maffei, C. (1999). Borderline personality disorder and childhood sexual abuse: a meta-analytic study. *Journal of personality disorders*, *13*(3), 268-280.

Golier, J. A., Yehuda, R., Bierer, L. M., Mitropoulou, V., New, A. S., Schmeidler, J., ... & Siever, L. J. (2003). The relationship of borderline personality disorder to posttraumatic stress disorder and traumatic events. *American Journal of Psychiatry*, *160*(11), 2018-2024.

Gorsuch, R. L. (1983). *Factor analysis* (2nd ed.). Hillsdale, NJ: Erlbaum.

Gray, M. J., Litz, B. T., Hsu, J. L., & Lombardo, T. W. (2004). Psychometric properties of the life events checklist. *Assessment*, *11*(4), 330-341.

Haslam, N. (2003). Categorical versus dimensional models of mental disorder: The taxometric evidence. *Australian and New Zealand Journal of Psychiatry*, *37*(6), 696-704.

Herman, J. L. (1992). Complex PTSD: A syndrome in survivors of prolonged and repeated trauma. *Journal of traumatic stress*, *5*(3), 377-391.

Herman, J. L., Perry, C., & Van der Kolk, B. A. (1989). Childhood trauma in borderline personality disorder. *The American journal of psychiatry*, *146*(4), 490.

Hogarty, K. Y., Hines, C. V., Kromrey, J. D., Ferron, J. M., & Mumford K. R. (2005). The quality of factor solutions in exploratory factor analysis: The influence of sample size, communality, and overdetermination. *Educational and Psychological Measurement, 65*, 202-226.

Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural equation modelling: Guidelines for determining model fit. *Articles*, 2.

Hutcheson, G., & Sofroniou, N. (1999). *The multivariate social scientist: Introductory statistics using generalized linear models*. Thousand Oaks, CA: Sage Publications

Hyland, P., Shevlin, M., Elklit, A., Murphy, J., Vallières, F., Garvert, D. W., & Cloitre, M. (2017). An assessment of the construct validity of the ICD-11 proposal for complex posttraumatic stress disorder. *Psychological Trauma: Theory, Research, Practice, and Policy*, *9*(1), 1.

Jongh, A., Resick, P. A., Zoellner, L. A., Minnen, A., Lee, C. W., Monson, C. M., ... & Rauch, S. A. (2016). Critical analysis of the current treatment guidelines for complex PTSD in adults. *Depression and anxiety*, *33*(5), 359-369.

Karatzias, T., Shevlin, M., Fyvie, C., Hyland, P., Efthymiadou, E., Wilson, D., ... & Cloitre, M. (2016). An initial psychometric assessment of an ICD-11 based measure of PTSD and complex PTSD (ICD-TQ): Evidence of construct validity. *Journal of Anxiety Disorders*, *44*, 73-79.

Karatzias, T., Shevlin, M., Fyvie, C., Hyland, P., Efthymiadou, E., Wilson, D., ... & Cloitre, M. (2017). Evidence of distinct profiles of Posttraumatic Stress Disorder (PTSD) and Complex Posttraumatic Stress Disorder (CPTSD) based on the new ICD-11 Trauma Questionnaire (ICD-TQ). *Journal of affective disorders*, *207*, 181-187.

Kendell, R. E., Helzer, J. E., & Hudziak, J. J. (2002). Five criteria for an improved taxonomy of mental disorders. *Defining psychopathology in the 21st century: DSM-5 and beyond*, 3-18.

Kilpatrick, D. G., Resnick, H. S., Baber, B., Guille, C., & Gros, K.(2011). *The National Stressful Events Web Survey (NSES-W)*. Charleston: Medical University of South Carolina.

Klein, D. N., & Riso, L. P. (1993). Psychiatric disorders: problems of boundaries and comorbidity.

Knefel, M., Garvert, D. W., Cloitre, M., & Lueger-Schuster, B. (2015). Update to an evaluation of ICD-11 PTSD and complex PTSD criteria in a sample of adult survivors of childhood institutional abuse by Knefel & Lueger-Schuster (2013): A latent profile analysis. *European Journal of Psychotraumatology*, *6*.

Knefel, M., & Lueger-Schuster, B. (2013). An evaluation of ICD-11 PTSD and complex PTSD criteria in a sample of adult survivors of childhood institutional abuse. *European Journal of Psychotraumatology*, *4*, 22608

Knefel, M., Tran, U. S., & Lueger-Schuster, B. (2016). The association of posttraumatic stress disorder, complex posttraumatic stress disorder, and borderline personality disorder from a network analytical perspective. *Journal of Anxiety Disorders*, *43*, 70-78.

Landy, M. S., Wagner, A. C., Brown-Bowers, A., & Monson, C. M. (2015). Examining the evidence for complex posttraumatic stress disorder as a clinical diagnosis. *Journal of Aggression, Maltreatment & Trauma*, *24*(3), 215-236.

Lewis, K. L., & Grenyer, B. F. (2009). Borderline personality or complex posttraumatic stress disorder? An update on the controversy. *Harvard review of psychiatry*, *17*(5), 322-32.

Linehan, M. M. (1993). Cognitive behavioral treatment of borderline personality disorder. New York, NY: Guilford Press.

Lobo, D. M., & Agius, M. (2012). The mental illness spectrum. *Psychiatria Danubina*, *24*(1), 157-160.

Lo, Y., Mendell, N. R., & Rubin, D. B. (2001). Testing the number of components in a normal mixture. *Biometrika*, 767-778.

MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological methods*, *4*(1), 84

Maercker, A., Brewin, C. R., Bryant, R. A., Cloitre, M., Ommeren, M., Jones, L. M., ... & Somasundaram, D. J. (2013). Diagnosis and classification of disorders specifically associated with stress: proposals for ICD-11. *World Psychiatry*, *12*(3), 198-206.

Marshall, G. N., Schell, T. L., & Miles, J. N. (2009). Ethnic differences in posttraumatic distress: Hispanics' symptoms differ in kind and degree. *Journal of consulting and clinical psychology*, *77*(6), 1169.

Mina, E. E. S., & Gallop, R. M. (1998). Childhood sexual and physical abuse and adult self-harm and suicidal behaviour: a literature review. *The Canadian Journal of Psychiatry*, *43*(8), 793-800.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Prisma Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS med*, *6*(7), e1000097.

Mollica, R. F., Caspi-Yavin, Y., Bollini, P., Truong, T., Tor, S., & Lavelle, J. (1992). The Harvard Trauma Questionnaire: validating a cross-cultural instrument for measuring torture, trauma, and posttraumatic stress disorder in Indochinese refugees. *The Journal of nervous and mental disease*, *180*(2), 111-116.

Morrison, A. P., Frame, L., & Larkin, W. (2003). Relationships between trauma and psychosis: A review and integration. *British Journal of Clinical Psychology*, *42*(4), 331-353.

Murphy, S., Elklit, A., Dokkedahl, S., & Shevlin, M. (2016). Testing the validity of the proposed ICD-11 PTSD and complex PTSD criteria using a sample from Northern Uganda. *European Journal of Psychotraumatology*, *7*.

National Heart, Lung, and Blood institute (2014). Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies. Retrieved from: https://www.nhlbi.nih.gov/health-pro/guidelines/in-develop/cardiovascular-risk-reduction/tools/cohort

Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural equation modeling*, *14*(4), 535-569.

Oberski, D. L.. (2016). Mixture models: latent profile and latent class analysis. In Robertson, J., & Kaptein, M. (Eds.), In *Modern statistical methods for HCI: a modern look at data analysis for HCI research* Switzerland: Springer. doi:10.1007/978-3-319-26633-6_12

Pedersen, D., Tremblay, J., Errázuriz, C., & Gamarra, J. (2008). The sequelae of political violence: assessing trauma, suffering and dislocation in the Peruvian highlands. *Social science & medicine*, *67*(2), 205-217.

Perkonigg, A., Höfler, M., Cloitre, M., Wittchen, H. U., Trautmann, S., & Maercker, A. (2015). Evidence for two different ICD-11 posttraumatic stress disorders in a community sample of adolescents and young adults. *European archives of psychiatry and clinical neuroscience*, 1-12.

Reed, G. M., Correia, J. M., Esparza, P., Saxena, S., & Maj, M. (2011). The WPA-WHO Global Survey of Psychiatrists' Attitudes Towards Mental Disorders Classification. *World Psychiatry*, *10*(2), 118-131.

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

Sachser, C., Keller, F., & Goldbeck, L. (2016). Complex PTSD as proposed for ICD-11: validation of a new disorder in children and adolescents and their response to Trauma-Focused Cognitive Behavioral Therapy. *Journal of Child Psychology and Psychiatry*.

Schwarz, G. (1978). Estimating the dimension of a model. *The annals of statistics*, *6*(2), 461-464.

Sclove, S. L. (1987). Application of model-selection criteria to some problems in multivariate analysis. *Psychometrika*, *52*(3), 333-343.

Steil, R., & Füchsel, G. (2006). *Interviews zu Belastungsstörungen bei Kindern und Jugendlichen (IBS-KJ): Diagnostik der Akuten und der Posttraumatischen Belastungsstörung*. Hogrefe.

Steinberg AM, Rodriguez N, Goenjian AK, Pynoos RS: *UCLA Trauma Reminder Inventory.* Los Angeles: UCLA Trauma Psychiatry Program; 2002.

Tay, A. K., Rees, S., Chen, J., Kareth, M., & Silove, D. (2015). The structure of post-traumatic stress disorder and complex post-traumatic stress disorder amongst West Papuan refugees. *BMC psychiatry*, *15*(1), 1.

Tein, J. Y., Coxe, S., & Cham, H. (2013). Statistical power to detect the correct number of classes in latent profile analysis. *Structural equation modeling: a multidisciplinary journal*, *20*(4), 640-657.

UNICEF (2010) B&H Postwar Screening Survey.

Van der Kolk, B. A., Pelcovitz, D., Roth, S., & Mandel, F. S. (1996). Dissociation, somatization, and affect dysregulation. *The American journal of psychiatry*, *153*(7), 83.

Van der Kolk, B. A., Roth, S., Pelcovitz, D., Sunday, S., & Spinazzola, J. (2005). Disorders of extreme stress: The empirical foundation of a complex adaptation to trauma. *Journal of traumatic stress*, *18*(5), 389-399.

Watson, S., Gallagher, P., Dougall, D., Porter, R., Moncrieff, J., Ferrier, I. N., & Young, A. H. (2013). Childhood trauma in bipolar disorder. *Australian and New Zealand journal of psychiatry*, 0004867413516681.

Weathers, F. W., Keane, T. M., & Davidson, J. R. (2001). Clinician-Administered PTSD Scale: A review of the first ten years of research. *Depression and anxiety*, *13*(3), 132-156.

Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). The PTSD checklist for DSM-5 (PCL-5). National Center for PTSD.www.ptsd.va.gov

Wittchen, H. U., & Pfister, H. (1997). DIA-X-Interviews: Manual für Screening-Verfahren und Interview; Interviewheft.

Wolf, E. J., Miller, M. W., Kilpatrick, D., Resnick, H. S., Badour, C. L., Marx, B. P.. *et al.* (2015). ICD–11 Complex PTSD in US National and Veteran Samples Prevalence and Structural Associations With PTSD. *Clinical Psychological Science*, *3*(2), 215-229.

Wolfe, J., & Kimerling, R. (1997). Gender issues in the assessment of posttraumatic stress disorder.

Zanarini, M. C., Williams, A. A., Lewis, R. E., & Reich, R. B. (1997). Reported pathological childhood experiences associated with the development of borderline personality disorder. *The American journal of psychiatry*, *154*(8), 1101.

The influence of emotional regulation and interpersonal problems in the development of PTSD in a sample of male prisoners

Richard Browne*[1], Thanos Karatzias[2], Angus MacBeth[1]

[1] Clinical and Health Psychology, University of Edinburgh, UK

[2] Rivers Centre for Traumatic Stress, NHS Lothian

*Address for correspondence:

Clinical and Health Psychology,

School of Health in Social Science,

University of Edinburgh,

Edinburgh EH8 9AG

0131 651 3969

(Email: s1475214@sms.ed.ac.uk)

Prepared for the Journal of Traumatic Stress

Word count: 6446

Key words: Trauma, post-traumatic stress disorder, PTSD, males, prison, forensic, emotional regulation, interpersonal problems

Abstract

Post-traumatic stress disorder (PTSD) is thought to be associated with difficulties with emotional regulation, and interpersonal problems. Male prisoners are known to have experienced significant levels of trauma, however there is limited evidence about the factors associated with the presentation of PTSD in this population. This quantitative, cross-sectional study examined the association between emotional regulation difficulties, interpersonal problems, and post-traumatic stress disorder (PTSD). A convenience sample of male prisoners (n = 51) was recruited from a Scottish prison, and compared to a matched sample of treatment-seeking men, from a specialist trauma clinic (n = 46). Male prisoners were found to have experienced significant numbers of traumatic experiences prior to incarceration, and a large proportion presented with PTSD (62.7%). A multiple regression was conducted examining the proportion of variance in PTSD symptoms which was explained by difficulties with emotional regulation, interpersonal problems among the two samples. In the forensic sample this model was highly significant, explaining 59% of the variance, however only difficulties with emotional regulation emerged as a significant predictor of PTSD severity. In the community sample the model explained 35% of the variance, and both difficulties with emotional regulation and interpersonal distancing were found to be significant predictors. Findings have implications for trauma treatment among male offenders, and the provision of trauma-informed prison services.

Introduction

Prisoners are known to have experienced higher numbers of traumatic experiences than the general population, many of which occur prior to incarceration (Briere, Agee, & Dietrich, 2016; Timmerman & Emmelkamp; 2001) and both trauma and PTSD have been linked to offending and number of custodial sentences (Anderson, Geier, & Cahill, 2015; Sarchiapone, Carli, Cuomo, Marchetti, & Roy, 2009). Given this context there is an apparent lack of research into post-traumatic stress disorder (PTSD) in prison samples. Goff, Rose, Rose and Purves (2007) systematically reviewed the evidence, and found only four studies relating to the prevalence of PTSD. Across these studies the prevalence of PTSD ranged from 4% - 21.4%. A recent piece of research, the first to examine the prevalence of PTSD in a UK-based prison, found that 60.5% of female inmates met criteria for PTSD (Howard, Karatzias, Power, & Mahoney, 2016).

PTSD is associated with difficulties with emotional regulation (Ehring, 2010), and both PTSD and emotional dysregulation are associated with increased risk of aggression and rates of recidivism among offenders (Ardino, Milani, & Blasio, 2013; Grann & Wedin, 2002; Roberton, Daffern, & Bucks, 2012). Therefore, it is important to understand how PTSD presents among prisoners, in order to identify at-risk individuals, and promote recovery and rehabilitation. Knowledge of the factors which contribute to the development and maintenance of PTSD among men is particularly important. Males tend to engage in less help-seeking behaviour than females (Galdas, Cheater & Marshall, 2005); and there are gender differences in the presentation of PTSD across a number of domains including: guilt, self-worth, impulse control, anger and coping styles (Olff, Langeland, Draijer, & Gersons, 2007; Tonlin & Foa, 2006)

Emotional regulation, interpersonal relationships and PTSD

Emotional regulation has been conceptualised as involving four key factors: (a) an awareness and understanding of emotions; (b) acceptance of emotions; (c) the ability to control impulsive behaviours and engage in goal directed behaviour; and (d) the ability to use situationally appropriate emotion regulation strategies to modulate emotional responses (Gratz & Roemer, 2004). People with PTSD have been found to have significant difficulties in each of these areas (Ehring & Quack, 2010). In addition, PTSD is associated with alexithymia (difficulty identifying and describing emotions; Frewen, Dozois, Neufeld, & Lanius, 2008); and increased levels of experiential avoidance (Kashdan, Morina, & Priebe, 2009; Marx & Sloan, 2005). Together these

results indicate that difficulty with emotional regulation plays an important role in the development, and maintenance of, PTSD. They also suggest that pre-trauma difficulties with emotional regulation may be associated with the development of PTSD. However, a lack of prospective studies limits the veracity of attempts to infer causality.

In addition to emotional regulation, PTSD is also associated with difficulties in interpersonal relationships, and a lack of social support has been consistently found to be significant risk factors for developing PTSD. In their meta-analysis, Brewin, Andrews and Valentine (2000), found that lack of social support was the largest predictor for developing PTSD following a traumatic experience (r = 0.40), with life stress (r = 0.32) and trauma severity (r = 0.23) the next largest predictors. Ozer, Best, Lipsey and Weiss (2003) conducted a subsequent meta-analysis of risk factors for PTSD. In their analysis, a lack of social support was also a strong predictor (r = .28). However, the strongest predictor of developing PTSD was peritraumatic dissociation (r = .35), which reflects levels of dissociation during or shortly after the trauma, a factor not included by Brewin et al. In addition, high peritraumatic emotionality, which relates to levels of emotion at or shortly after the traumatic incident, was also a significant predictor (r = .26). It could be argued that high peritraumatic emotionality and dissociation indicate difficulties with emotional regulation; as they represent difficulty using coping strategies, and modulating emotional responses**.** These two meta-analyses indicate that interpersonal problems, and difficulties with emotional regulation, are significant risk factors for the development of PTSD. Among prisoners with PTSD, higher levels of worry, and a negative perception of other people's support, have been found to be associated with higher levels of re-offending, highlighting the significance of these factors in a forensic population (Ardino et al, 2013).

PTSD is also related to significant psychosocial impairment in a range of areas, including education, marriage and employment (Kessler, 2000). In a sample of females who had experienced childhood trauma, the degree of functional impairment associated with interpersonal problems and emotional regulation difficulties was equal to that of PTSD symptoms (Cloitre, Miranda, Stovall-McClough, & Han, 2005).

Complex Trauma

There is also evidence that difficulties with emotional regulation and interpersonal relationships are particularly prevalent in individuals who have experienced prolonged interpersonal, or complex-trauma (Cloitre, Scarvalone, & Difede 1997; Briere & Rickards, 2007). Research has shown that aspects of emotional regulation are learned though interaction with caregivers (Calkins & Hill, 2007; Cole, Michel & Teti, 1994), and problems with early attachment are associated with difficulties with emotional regulation (Cloitre, Stovall-McClough, Zorbas, & Charuvastra., 2008). Such prolonged traumatic experiences are common among offenders, and are associated with increased levels of aggression, impoverished peer relations and mental health difficulties (Sarchipone et al., 2009; Ford, Chapman, Connon, & Cruise, 2012)

The traditional approach to treating CPTSD (Herman, 1992; Cloitre et al., 2012) involves three phases. The first phase promotes safety and stabilisation, including developing emotional regulation strategies, and accessing support networks; the second phase utilises trauma processing; and in the third stage individuals reconnect with important aspects of their life and social relationships. Cloitre, Miranda, Stovall-McClough and Chemtob (2004) found that the quality of the therapeutic alliance predicted the effectiveness of phase-two exposure work, but that this relationship was mediated by the participant's ability to regulate their emotions. Thus it seems that effective emotional regulation strategies are important to successfully engage with the taxing process of exposure. It also highlights the complex interplay between the therapeutic relationship and emotional regulation in the treatment of PTSD.

In addition to PTSD, trauma is linked to a range of other mental health problems, including 'personality difficulties', which are also common among the prison population (Fazel & Danesh, 2002). Some have argued that personality difficulties, particularly borderline personality disorder, should be conceptualised as adaptive post-traumatic reactions (Van der Kolk, Hostetler, Herron, & Fisler, 1994). However, in spite of the overlap in aetiology, there is evidence that CPTSD and BPD should be viewed as separate diagnostic entities (Cloitre, Garvert, Brewin, Bryant, & Maercker, 2013); underscoring the complexity of the area.

Emotional regulation and interpersonal relationships in the prison population.

Expressing and regulating emotions, and managing the interpersonal context of prison can present a range of difficulties for inmates. Male prisoners may attempt to put on a front in order to mask emotions and ensure emotional, psychological and social survival (De Viggini, 2012). However, Crewe (2014) highlights that a range of deep emotional and supportive bonds exist between male inmates, which help modulate emotion; however, these can be obscured by overt displays of masculinity and bravado. Gross and Thompson (2007) describe five strategies for regulating emotions: situation selection; situational modification; attentional deployment; cognitive change; and response modulation. Prisoners have been found to utilise all of these strategies, but often in nuanced ways, determined by the restrictive environment (Laws & Crewe, 2016). The aforementioned evidence also suggests that personal-histories, and current circumstances, of men in prison may impact their ability to regulate their emotions, and to utilise social support. However, the impact this has on the development, maintenance, and treatment of PTSD is unknown.

Overall, research has indicated that offenders experience high levels of trauma both prior to incarceration, and during prison sentences, and there is evidence of rates of PTSD among prison populations which exceed those in the community (Goff et al., 2007; Timmerman & Emmelkamp; 2001; Weeks & Widom, 1998). However, much of this research has focused on female prison populations. Emotional regulation, and interpersonal difficulties are known to be associated with PTSD in the general population (Brewin et al., 2000; Ozer et al., 2003), and are also associated with aggression and recidivism among offenders (Ardino et al., 2013; Grann & Wedin, 2002; Roberton et al., 2012). It is currently unclear if the patterns of association between PTSD, emotional regulation and interpersonal difficulties differ among men who have experienced trauma in forensic and community settings. Understanding how PTSD presents in prison populations has implications for the identification and treatment of at risk individuals.

Current study

The current study aimed to answer three questions:

1. What is the proportion of individuals with PTSD symptoms in a Scottish male prison sample?

2. What is the association between emotional regulation, interpersonal problems and PTSD in a prison sample?
3. How do the associations between emotional regulation and interpersonal problems compare between a forensic and a treatment-seeking community sample?

It was hypothesised that emotional regulation difficulties and problems with interpersonal relationships would be significantly associated with PTSD symptomatology in a prison population. Secondly, it was hypothesised that there would be significant differences between prison and community samples on a measure of emotional regulation. Thirdly, it was hypothesised that emotional regulation and interpersonal relationships would predict a significant amount of the variance in PTSD symptoms in both forensic and community samples.

Methods

Study Design

This study utilised a quantitative, cross-sectional design. Participants completed a set of five questionnaires, with assistance from a researcher. Ethical approval for this study was granted by the West of Scotland Research Ethics Committee (Appendix 6), and the Scottish Prison Service Research and Ethics Committee.

Participants

The main data for this study came from a sample of n = 51 male inmates, residing in HMP Glenochil, a male only prison in Scotland. Within this sample n = 36 (71%) were recruited from the sex offender population, and n = 15 (29%) were recruited from the mainstream population. N = 33 (65%) were serving sentences of between 6 months and 16 years, the other n = 18 (35%) were serving either life sentences, or orders of life long restriction.

Recruitment of this sample was conducted by the main author. Inclusion criteria were: male offenders over 18 years of age; currently serving a custodial sentence at HMP Glenochil; who consented to participate. Exclusion criteria included: a known learning disability; a diagnosis of non-affective psychosis; current self-harm; and suicidal ideation or intent. Where necessary eligibility was discussed with prison health-care staff. Due to limited access to translation, only individuals who could understand written or verbal English were included.

This study aimed to find if the factors associated with the development of PTSD differ between men in a prison population and trauma-exposed males in a community setting. In order to analyse this, the forensic sample was matched on gender and approximately matched on age (+/- 5 years), with trauma-exposed individuals from an existing community data set (Karatzias, et al., 2017). The community sample consisted of N = 46 treatment-seeking males, presenting to a specialist trauma service in NHS Lothian. Inclusion criteria were: males; over the age of 18; seeking treatment for PTSD or a trauma reaction; who consented to have their data collected. Exclusion criteria included: a known learning disability; and those with current suicidal ideation or intent. For individuals who could not read or speak English an interpreter was provided. The full forensic sample was included in the analyses, but n = 5 could not be matched with community comparisons on age.

The forensic sample was recruited via individual letters sent to all inmates in HMP Glenochil (N = 670; Figure 1). Individuals who responded were invited to an individual meeting in a quiet, well-lit room. At this time further information was provided, and eligibility criteria applied. If risk was deemed low, and participants consented to take part, demographic data and measures were also collected. In the community sample, individuals who were accepted for treatment at the trauma-service would meet initially with a researcher in a quiet well-lit room. The reasons for collecting data were explained and, if individuals consented, a battery of measures completed.

Measures

Data was collected using four measures. *The Life Events Checklist* (LEC-5; Gray et al., 2004). The LEC-5 is a 17-item, standardised, self-report questionnaire, designed to screen for potentially traumatic events. It was used to confirm DSM-5 PTSD criterion A: "The person was exposed to: death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence" (DSM-5; American Psychiatric Association [APA], 2013). The LEC-5 assesses exposure to 16 events known to be linked to the development of PTSD, and includes one additional item assessing any other traumatic experience. The LEC-5 is adapted from the previous LEC measure, in line with new DSM-5 criteria. The original LEC has established reliability and validity and has been shown to be significantly related to a range of measures of traumatic symptomatology (Gray et al., 2004). Psychometrics for the LEC-5 are not currently available, however, changes from the original LEC are minimal, and few psychometric differences are expected (U.S. Department of Veterans Affairs, 2017).

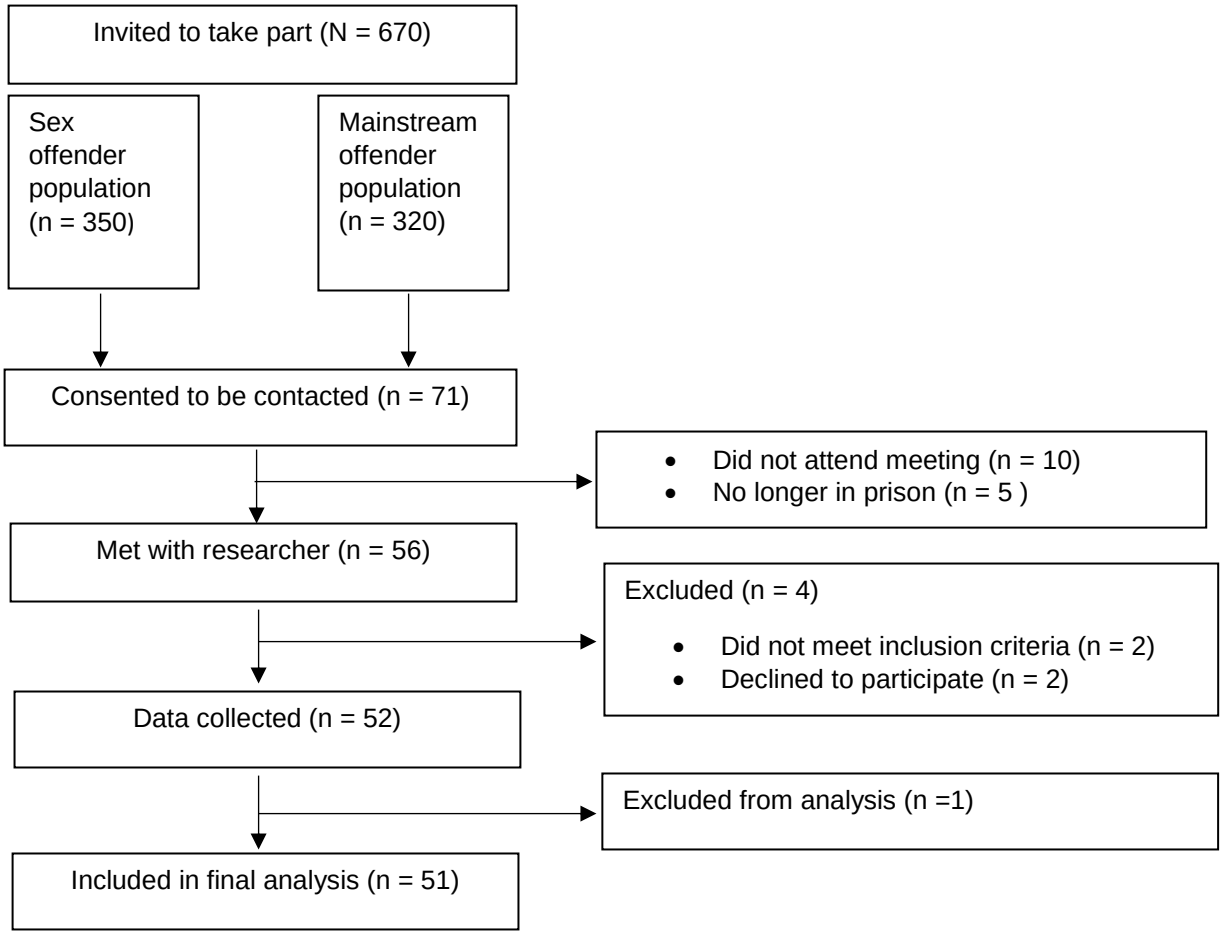

Figure 1. Flow chart of recruitment and participation

The PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013) was used to assess PTSD symptom severity. The PCL-5 is a 20-item, standardised, self-report questionnaire. It is split into four clusters assessing the DSM-5 PTSD criteria: intrusive memories; avoidance; cognitions and mood; and arousal. A score of 33 or higher has been found to indicate PTSD caseness (Bovin et al., 2016). The PCL-5 has been shown to be a psychometrically sound measure of *DSM–5* PTSD symptoms, which can provide a provisional diagnosis and detect clinical change (Wortmann et al., 2016). In the current study, the PCL-5 was found to have good reliability ($\alpha = .91$).

The Difficulties in Emotional Regulation Scale (DERS; Gratz & Roemer, 2004). The DERS is a 36-item, standardised, self-report measure of difficulties in emotional regulation. Participants rate how frequently each item applies about themselves on a 5-point scale from ‘almost never’ to ‘almost always’. The DERS has high internal consistency, good test–retest reliability, and

adequate construct and predictive validity (Gratz & Roemer, 2004). In the current study, the DERS was found to have good internal consistency (α = .94).

The Inventory of Interpersonal Problems – 32 Item Version (IIP-32; Barkham, Hardy, & Startup, 1996). The IIP-32 is a 32-item, standardised, self-report measure of interpersonal difficulties. It has been shown to have acceptable reliability; structural validity and is sensitive to clinical change (Soldz et al., 1995). Two subscales were utilised for the purposed of this study: problems with interpersonal distancing and problems with interpersonal affiliation. The interpersonal distancing scale consists of 16 items, and was found to have good internal consistency (α = .87). The interpersonal affiliating subscale consists of 17 items and was found to have good internal consistency (α = .88), in the current study.

The Standardised Assessment of Personality: Abbreviated Scale (SAPAS; Moran et al., 2003). The SAPAS is an 8-item, standardised, clinician administered measure which screens for personality disorder. Respondents answer yes or no to a number of questions. A score of 3 more has been found to correctly identify 80% of individuals with a personality disorder, and the scale had good reliability and validity (Moran et al., 2003; Hesse & Moran, 2010).

Analysis

Data were examined and found to meet the assumptions of normality, linearity, homoscedasticity and multicollinearity (Osborne et al., 2002). One outlier was removed from the forensic dataset due to high, and inconsistent, scoring. Associations between variables were investigated using a series of correlations. The means of the two samples were compared using t-tests. Multiple linear regression applied to the samples, in order to compare the amount of variance in PTSD scores explained by emotional regulation difficulties, interpersonal problems in the two samples.

Results

Participant characteristics

Descriptive data for the forensic and community matched samples are reported in Table 1. There were no significant differences between forensic and community groups in terms of age, marital status or ethnicity. A significantly higher proportion of the community sample were taking prescribed psychiatric medication ($\chi^2(3) = 18.95$). No significant differences were found between the two samples in terms of education. However, it is possible that there were

differences in this area, as 31% of the forensic sample reported leaving school with no qualifications, this data was not recorded for the community data set.

There were no significant differences in the average number of traumatic experiences between the two groups. However, a significantly higher proportion of the community sample met criteria for PTSD than in the forensic sample (97.8% versus 62.7%; $\chi^2(1) = 18.19$, $p < .001$). Groups did not differ significantly on their experiences of sexual assault, or unwanted sexual experiences. However, a significantly higher proportion of the forensic sample had experienced physical assaults across their life-time than those in the community sample (92.2% versus 69.6%; $\chi^2(1) = 8.17$, $p = .004$).

Table 1. Demographic data

	Forensic sample (N = 51)	**Community sample (N = 46)**
Age (SD, range)	41.47 (13.75, 22-73)	40.70 (12.73; 19 – 67)
Marital status		
Single	72.5%	56.5%
Married / cohabiting / civil partnership	17.6%	23.9%
Divorced	9.8%	10.9%
Unknown		8.7%
Ethnicity		
British	94.2%	93.5%
Other European	2.0%	
Asian		4.3%
Other	3.9%	2.2%
Education		
School / college	86.3%	93.5%
University	13.7%	6.5%

Psychotropic medication		
No medication	66.7%	23.9%**
Antidepressant	21.6%	41.3%
Antipsychotic	3.9%	19.6%
Other / unknown	7.9%	15.2%
Traumatic experiences		
Total number of traumatic experiences	5.75, SD = 2.24	5.02, SD = 2.52
Experienced sexual assault	47.1%	28.3%
Experienced physical assault	92.2%*	69.6%*
Met criteria for PTSD	62.7%**	97.8%**

Notes: * Difference significant at the <.05 level; ** Difference significant at the <.001 level

Correlational analyses

Correlations between key variables for the forensic sample are shown in Table 2. A large magnitude correlation was found between the PCL and the DERS (r(49) = .80, p < .01). The PCL was also moderately correlated with the and IIP-affiliating (r(49) = .40, p < 0.01); and IIP-distancing subscales (r(49) = .39, p < .01). The DERS was found to be moderately correlated with both the IIP-affiliating (r(49) = .46, p < .01); and IIP-distancing subscales (r(49) =.57, p < .01). The LEC did not correlate with any other measures.

Table 2. Correlations between variables for the forensic sample

	LEC-Total	IIP-Aff	IIP-Dist	DERS-Total	DERS Non-accept	DERS Goals	DERS Impulse	DERS Awareness	DERS Strategies	DERS Clarity
PCL-Total	.21	.40**	.39**	.79**	.75**	.65**	.47**	.13	.77**	.57**
LEC-total	-	-.03	.16	.13	.17	.15	-.02	.13	.09	.04
IIP-Affiliating	-	-	.48**	.46**	.54**	.36*	.26	.05	.42**	.31*
IIP-Distancing	-	-	-	.57**	.45**	.43**	.41**	.32*	.39**	.51**

Note: IIP-aff IIP-Affiliating; IIP-Dist, IIP-Distancing; DERS Non-accept, non-acceptance of emotional responses; DERS Goals, difficulty engaging in goal directed behaviour; DERS Impulse, impulse control difficulties; DERS awareness, lack of emotional awareness; DERS Strategies, limited access to emotion regulation strategies; DERS Clarity , lack of emotional clarity

* Correlation significant at the <.05 level; ** Correlation significant at the <.001 level

Correlations between key variables for the community sample can be found in Table 3. With regard to significant correlations, the PCL was moderately correlated with the DERS ($r(44) = .56$, $p < .01$); and the IIP-distancing subscale ($r(44) = .56$, $p < .01$). The DERS was strongly correlated with the IIP-distancing subscale ($r(44) = .61$, $p < .01$); and weakly correlated with the IIP-Affiliating subscale ($r(44) = .30$, $p < .01$). The LEC- 5 did not significantly correlate with any other measures.

Comparisons between forensic and community samples

Descriptive statistics and t-tests for symptom and psychological variables are shown in Table 4. The community sample had significantly higher scores on all variables, other than the IIP-distancing and the awareness subscale of the DERS and the total number of traumatic experiences.

Table 3. Correlations between variables in the community sample

	LEC-Total	IIP-Aff	IIP-Dist	DERS-Total	DERS Non-accept	DERS Goals	DERS Impulse	DERS Awareness	DERS Strategies	DERS Clarity
PCL-Total	.26	.19	.56**	.56**	.24	.48**	.65**	-.16	.56**	.45**
LEC-total	-	.28	.08	.08	-.06	-.03	.18	-.20	.24	.14
IIP-Affiliating	-	-	.41**	.30**	.06	.30*	.18	.01	.41**	.23
IIP-Distancing	-	-	-	.61**	.34*	.45**	.47**	.18	.62**	.34*

Note: IIP-aff IIP-Affiliating; IIP-Dist, IIP-Distancing; DERS Non-accept, non-acceptance of emotional responses; DERS Goals, difficulty engaging in goal directed behaviour; DERS Impulse, impulse control difficulties; DERS awareness, lack of emotional awareness; DERS Strategies, limited access to emotion regulation strategies; DERS Clarity , lack of emotional clarity

* Correlation significant at the <.05 level; ** Correlation significant at the <.001 level

Effect of sentence duration, offence type and PD screen on variables in forensic sample

As previously noted, 62.7% of the forensic sample met criteria for PTSD. T-tests were used to investigate differences between those with PTSD and those without on key variables. It was found that those with PTSD scored significantly higher on all variables, other than the LEC (Table 5).

In the forensic sample 72.5% (n = 37) met caseness for PD using the SAPAS screening tool. Those who met caseness for PD were found to score significantly higher on the PCL-5 (mean 40.76 versus 26.79, $t(49) = 2.41$, $p = .020$) and the DERS (mean 101.95 versus 80.07, $t(49) = 2.66$, $p = .011$), no significant difference were found on the other variables.

The mainstream offender subset was found to score significantly higher than the sex-offender subset on the PCL-5 (mean 44.80 versus 33.64, $t(47) = -2.49$, $p = .016$), but these groups did not differ significantly on any other variables. Individuals who were serving a life sentence, or an order of life long restriction were found to score significantly higher on IIP-distancing than those

without these sentence types (mean 29.50 versus 19.23, $t(47) = 2.89$, $p = .01$), but these groups did not differ significantly on any other variables.

Table 4. Means and standard deviations for PTSD severity, difficulties in emotional regulation and interpersonal problems.

Variable	**Forensic sample**		**Community sample**	
	Mean	**SD**	**Mean**	**SD**
PTSD severity (PCL-5)	36.92	19.38	57.51**	13.17
Interpersonal distancing (IIP-32)	23.00	13.64	27.52	11.40
Interpersonal affiliating (IIP-32)	24.27	13.97	30.90*	12.05
Difficulties with emotional regulation total (DERS)	95.94	27.78	123.71**	21.91
DERS subscales				
Non-acceptance	15.53	6.61	22.20**	6.44
Goals	14.90	6.00	20.22**	4.39
Impulsivity	13.14	6.27	18.09**	5.62
Awareness	19.02	5.39	19.4	5.06
Strategies	21.02	9.03	27.74**	7.20
Clarity	12.28	4.30	16.07**	3.50

Note: DERS Non-accept - non-acceptance of emotional responses; DERS Goals – difficulty engaging in goal directed behaviour; DERS Impulse – impulse control difficulties; DERS awareness – lack of emotional awareness; DERS Strategies – limited access to emotion regulation strategies; DERS Clarity – lack of emotional clarity

* Difference significant at the <.05 level; ** Difference significant at the <.001 level

Table 5. Differences between those with and without PTSD in the forensic sample

	PTSD		Without PTSD	
	mean	SD	Mean	SD
LEC	6.06	2.02	5.21	2.56
PTSD severity (PCL-5)	49.50	11.06	15.74**	8.82
Difficulties with emotional regulation (DERS)	109.66	21.11	72.84**	21.88
Interpersonal distancing (IIP-32)	26.55	12.59	16.89*	13.53
Interpersonal affiliating (IIP-32)	27.77	13.72	18.22*	12.55

* Difference significant at the <.05 level; ** Difference significant at the <.001 level

Multiple regression analysis

A multiple linear regression was used to examine whether difficulties with emotional regulation, and interpersonal problems, predicted the severity of PTSD symptoms. In the forensic sample the model was found to explain 59% of the variance in PTSD scores (F (3,45) = 23.93, $p < .001$, $R^2 = .62$ $R^2_{\text{adjusted}} = .59$; Table 6). The model was also significant in the subset of the forensic sample who met caseness for PTSD, and explained 31% of the variance in PTSD scores (F (3, 27) = 5.42; $p = .005$ $R^2 = .38$, $R^2_{\text{adjusted}} = .31$; Table 7).

Examination of the beta-weights for the whole forensic sample, and the PTSD subset, show that interpersonal problems did not significantly predict the level of PTSD symptoms. However, difficulties in emotional regulation were highly predictive of PTSD symptoms ($p < .001$), such

that greater difficulties with emotional regulation predicted a greater severity of PTSD symptoms (Tables 6 & 7).

In the community sample the model was found to explain 35% of the variance in PTSD scores (F (3,42) = 8.96, $p < .001$, $R^2 = .39$ $R^2_{\text{adjusted}} = .35$). In the subset of the community sample who met caseness for PTSD the model explained 28% of the variance in PTSD scores (F (3, 41) = 6.69, $p = .001$, $R^2 = .39$ $R^2_{\text{adjusted}} = .35$; Table 9). Examination of the beta-weights for the whole community sample, and the PTSD subset, show both difficulties with emotional regulation and interpersonal distancing significantly predicted the level of PTSD symptoms ($p < .05$). However, interpersonal affiliation was not a significant predictor (Tables 8 & 9).

Table 6. Summary of multiple regression for forensic sample (n=51) including those not meeting caseness for PTSD)

	B	SE B	*β*	*t*
(Constant)	-17.03	6.67		-2.55
Difficulties with emotional regulation	.57	.08	.80	6.90**
Interpersonal distancing	-.15	.17	-.11	.92
Interpersonal affiliating	.11	.15	.08	.69
Final model: adjusted $R^2 = .59$; $F = 23.93$; $p < .001$				

* Difference significant at the <.05 level; ** Difference significant at the <.001 level

Table 7. Summary for multiple regression of individuals meeting caseness for PTSD in forensic sample (n=32)

	B	SE B	*β*	*t*
(Constant)	15.66	8.97		1.75
Difficulties with emotional regulation	.35	.09	.66	3.84**
Interpersonal distancing	-.15	.16	-.17	-.91
Interpersonal affiliating	-.002	.15	-.002	-.01
Final model: adjusted $R^2 = .31.$; $F = 5.42$; $p = .005$				

* Difference significant at the <.05 level; ** Difference significant at the <.001 level

Table 8. Summary of multiple regression for community sample (n=46)

	B	SE B	*β*	*t*
(Constant)	20.79	9.72		2.14
Difficulties with emotional regulation	.22	.09	.36	2.36*
Interpersonal distancing	.42	.19	.36	2.25*
Interpersonal affiliating	-.07	.15	-.07	-.49
Final model: adjusted R^2 = .35; F = 8.96; p < .001				

* Difference significant at the <.05 level; ** Difference significant at the <.001 level

Table 9. Summary for multiple regression of individuals meeting caseness for PTSD in community sample (n=45)

	B	SE B	*β*	*t*
(Constant)	2.97	10.29		2.31
Difficulties with emotional regulation	0.21	0.10	.34	2.20*
Interpersonal distancing	0.40	0.19	.33	2.06*
Interpersonal affiliating	-.07	0.15	-0.69	-0.50
Final model: adjusted R^2 = .28; F = 6.69; p = .001				

* Difference significant at the <.05 level; ** Difference significant at the <.001 level

Discussion

Study findings

The current study was the first to examine rates of PTSD among men in a Scottish prison, and indicates a need for trauma-informed services to aid recovery and rehabilitation. It reports associations between emotional regulation, interpersonal problems and PTSD in a male prison sample; and provides a comparison with a treatment-seeking community sample. Individuals in the forensic sample were found to have experienced high number of traumatic events, and 62.7% met criteria for PTSD using the LEC-5 and PCL-5. These data do not allow the prevalence of PTSD to be determined, due to a lack of a randomised, and fully representative, sample. However, they do indicate rates of PTSD far in excess of that found in the general population (Kessler et al., 2005). They also exceed rates found in previous prison prevalence studies (Goff et al., 2007).

With regard to this finding, one possible explanation may be due to differences in the way that PTSD was measured in previously published studies. The lowest prevalence (4%) was found by Brink Doherty and Boer (2001), who utilised a computer-assisted version of the Structured Clinical Interview for DSM-IV (SCID). Higher prevalence has been found in studies, such as the present one, which used questionnaire based assessments. Therefore, it may be the case that self-report measures over-estimate trauma in high-risk samples. Alternatively, the higher prevalence found in the present study may also may be an artefact of the self-selecting sample; or it may indicate higher levels of trauma and PTSD among Scottish prisoners. Certainly, the proportion of individuals with PTSD in the current sample is comparable to those recently found among females in a Scottish prison (60.5%; Howard et al., 2017).

These data also indicate that there are different patterns of psychological variables associated with PTSD between men in forensic and community settings. In the forensic sample, difficulties with emotional regulation accounted for a greater proportion of the variance in PTSD scores than in the community sample, while interpersonal problems were not found to be significant predictors. Whereas, in the community sample both emotional regulation and interpersonal-distancing significantly predicted PTSD severity. It would appear that difficulties in emotional regulation among male prisoners are a highly significant predictor of PTSD symptoms, both in terms of those meeting caseness for PTSD, and those with sub-threshold symptomatology. This result was maintained when only those in the samples who met criteria for PTSD were included in the analysis, indicating a robust result.

In accordance with previous research (e.g. Ozer et al., 2003), these results indicate that difficulties with emotional regulation are associated with the development, and maintenance of PTSD in both community and prison settings. Effective emotion regulation includes both internal processes, such as cognitive appraisal and attentional deployment; and external processes including situational selection and response modulation (Gross & Thompson, 2007). In the restrictive prison environment the ability to utilise such processes may become additionally difficult (Laws & Crewe, 2016), and the development of adaptive emotional regulation strategies may be integral for good mental health. Prison also limits the availability of other coping strategies and protective factors, such as work, exercise, hobbies, and social relationships. This may increase the importance of internal emotional regulation strategies. It is also possible that a

difference in trauma histories between the two samples contributed to the results. It was not possible to determine the frequency of childhood trauma in the samples, which is in itself a predictor of emotion regulation difficulties. Nevertheless, it is clear that development of emotional regulation strategies is crucial for the psychological treatment, and rehabilitation of offenders. This is particularly pertinent, given that previous research has indicated a link between negative emotional states, difficulties with self-regulation, and offending (Day, 2009; Grann & Wedin, 2002).

The present study found that interpersonal distancing explained a significant amount of the variance in PTSD scores in the community, but not the forensic sample. Interpersonal distancing includes factors such as difficulty feeling close to others, social withdrawal and anger. Therefore, a distancing interpersonal stance is likely to prevent individuals accessing social support, a key factor in the development and maintenance of PTSD symptoms (Brewin et al., 2000; Ozer et al., 2003). These results highlight the importance of developing social supports among individuals with PTSD, and also highlight that impoverished social networks may be a risk factor for the development of PTSD.

Given the established role of social support and interpersonal relationships in PTSD, the lack of association between PTSD and interpersonal problems in the prison sample is notable. One possible explanation is that the prison environment limits people's ability to access social support, due to being cut off from the outside world. Many prisoners report suspicion of other inmates, and physical victimisation and violence are prevalent (Wolff, Blitz, Shi, Siegel & Bachman, 2007). In this context, it may be adaptive to distance yourself from others. In addition, the forensic sample may have had greater exposure to childhood adversity and trauma, which may impact reliance on interpersonal relationships. Conversely, it is also possible that the prison environment managed interpersonal problems so effectively that they were no longer associated with the severity of PTSD symptoms. However, the results of this should not be interpreted as indicating that interpersonal problems are not an important factor for men in prison. Previous research has shown that social support, both in prison and after release is associated with a higher quality of life (Jacoby & Kozie-Peak, 1997), and that a negative perception of social support is associated with higher re-offending risk (Ardino et al., 2013). The current findings support the possibility that working interpersonally with men in prison settings may require a

different approach than for similar community-based interventions. For instance, men in prison may need additional scaffolding to build their interpersonal support network. This could be aided by better links with people on the outside.

High levels of PD were also found in the sample, and those who met caseness for PD had a greater severity of PTSD symptoms, and greater difficulties with emotional regulation, this underscores the complexity of the presentations seen among men in prison, and the potential for diagnostic overlaps.

This study also highlights the challenges of conducting research in a prison environment. Due to the sensitivities of working with individuals with high levels of past and present trauma, and ongoing distress care had to be taken to develop a study that was acceptable for both staff and participants. Mental health staff were available in the event of high levels of distress, however this is a finite resource, with limited capacity. These tensions highlight the organisational challenges in assessing and providing trauma-related services for men in prison presenting with trauma.

Limitations

The results of this study should be viewed in the context of its limitations. Firstly, the lack of a baseline community sample prevents a comparison of the rate of trauma and PTSD between men in prison, and the general population. Instead a treatment-seeking community sample was employed, to compare factors associated with PTSD, between two trauma-exposed groups. Ideally, a three-group comparison would be utilised, however this was not feasible due to the scope of the project. Secondly, there are potentially differences between the two samples in terms of trauma exposure. The LEC-5 does not allow for measurement of childhood abuse, which is known to relate to difficulties with emotional regulation, and interpersonal relationships (Cloitre et al., 2011). There were concerns, and anecdotal evidence from prison psychologists, that a measure of childhood trauma could trigger distress. The LEC-5 was used as it allowed measurement of DSM-5 PTSD criteria A (exposure to trauma), whist being acceptable to prisoners. Thirdly, it was not possible to fully control for differences in the level of education attainment between the two groups, due to differences in demographic data collection. However, no significant differences were found in the numbers attending school and university. Fourthly, the majority of the forensic sample were sex offenders, serving long term sentences, and all were

recruited from one Scottish prison. It is possible that sex offenders constitute a group with different experiences and trauma reactions than the general prison population. Thus the ability to generalise across different prisoner groups and settings is not established**.** Fifthly, the sample of prisoners was self-selecting and it is possible that the levels of PTSD, and the association of emotional regulation and interpersonal problems, were not representative of the prison population. Sixthly, it was not possible to match five participants from the forensic sample, due to a limited range of ages in the community data set.

Implications for clinical practice

These results provide evidence that PTSD is experienced by a significant number of incarcerated males, although the self-selecting sample should be taken into account in the interpretation of these results. In addition, results indicate that emotional regulation is significantly associated with PTSD in both forensic and community samples, and that emotional regulation difficulties may be a significant risk factor PTSD in a forensic population.

There is some evidence that trauma-focused therapies may be effective for the treatment of PTSD in prison settings (Leigh-Hunt & Perry, 2015), although the number of randomised controlled trials is limited, and all are confined to the USA. The ability to emotionally regulate is a key component of trauma therapy and is associated with better outcomes in trauma processing work (Cloitre et al., 2004). However, some contend that trauma processing alone may be effective for the treatment of PTSD and CPTSD (Jongh et al., 2016). The strong association between emotional dysregulation and PTSD found in the present study indicates the importance of developing emotional regulation strategies in the treatment of PTSD in both prison and community settings. Creative strategies will likely be required to develop individualised strategies that are applicable in the prison environment. There is some evidence that techniques such as mindfulness may assist emotion regulation, and reduce aggression, in prison settings (Shonin, Van Gordon, Slade & Griffiths 2012). However, the research in this field is limited, with a limited number of randomised controlled trials.

In line with previous research (e.g. Brewin et al., 2000; Ozer et al., 2003) the results of this study highlight the importance of developing both emotional regulation, and social supports in the treatment of PTSD among men in the community. Although emotional regulation strategies are a key component of trauma therapy, less attention may be paid to developing social networks. This

is particular important as there is evidence that more severe PTSD is associated with greater erosion of social relationships (Laffaye, Cavella, Drescher, & Rosen 2008).

The Scottish Prison Service has highlighted the importance of trauma-informed prison services for women (Scottish Prison Service, 2015). The present study underlines the importance of trauma-informed service for all genders. Trauma-informed services aim to identify trauma-related symptoms, train staff in the effects of trauma, and minimise retraumatisation (Harris & Fallot, 2001 as cited in Miller & Najavits, 2012; Hodas, 2006). These tasks are made additionally complicated in a prison environment, where many elements of the system are punitive, and staff must remain vigilant to risk.

Results also suggest that prison staff should be trained to identify, and work with, the effects of trauma in male prisoners. Staff must be alert to the risk factors and symptoms of PTSD, and the results of this study indicate that difficulties with emotional regulation may be indicative of underlying PTSD in male prisoners. This is important as prisoners often do not disclose trauma histories due to a lack of trust (Grella & Greenwell, 2007). In addition, men are known to delay disclosing childhood abuse due factors including shame, mistrust and beliefs about masculinity (Easton, 2013; Easton, Leia, Saltzman, & Wills, 2014). Delayed disclosure has also been associated with increased distress and suicidality in men (Easton, 2013). Creating a supportive, trusting environment is likely to promote disclosure. However, this may present challenges in a prison setting, due to a lack of trust between offenders and staff, limited privacy, and the time pressures on staff. Therefore, services have to be creative in developing environments and relationships that promote disclosure. For those that disclose trauma, making sense of its impact on their lives, and sense-of-self, can promote post-traumatic growth (Easton, Coohey, Rhodes, & Moorthy, 2013).

In the general population, there is evidence that deconstructing rigid gender norms, and beliefs about masculinity can promote recovery (Easton et al., 2013). This will be difficult in a prison setting, but might be aided by trauma training across staff groups. A discussion with a trauma-informed staff member, who a prisoner respects, or identifies with, may be an important first step, and more accessible than initiating contact with mental health services.

Future research should identify whether this pattern of results is replicated in groups of male offenders with different offence histories, and in different prison settings. In addition, more work is required to develop the best ways of engaging, and working with, men who have experienced trauma, and those presenting with PTSD. Future research should also focus on how to best to promote effective emotional regulation in this population.

Conclusions

In conclusion, the results of this study provide evidence of the association between emotional dysregulation and PTSD among males in both community and forensic settings. They also indicate that this association may be particularly strong among men in prison. These results highlight the importance of trauma-informed prison services for men, which prioritise the treatment of PTSD symptoms, increased social support, and the development of emotional regulation strategies.

Bibliography

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed). Arlington, VA: Author.

Anderson, R. E., Geier, T. J., & Cahill, S. P. (2016). Epidemiological associations between posttraumatic stress disorder and incarceration in the National Survey of American Life. *Criminal Behaviour and Mental Health*, *26*(2), 110-123.

Ardino, V., Milani, L., & Di Blasio, P. (2013). PTSD and re-offending risk: the mediating role of worry and a negative perception of other people's support. *European journal of psychotraumatology*, *4*(1), 21382.

Barkham, M., Hardy, G. E., & Startup, M. (1996). The IIP-32: A short version of the Inventory of Interpersonal Problems. *British Journal of Clinical Psychology*, *35*(1), 21-35.

Bovin, M. J., Marx, B. P., Weathers, F. W., Gallagher, M. W., Rodriguez, P., Schnurr, P. P., & Keane, T. M. (2015). Psychometric Properties of the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders–Fifth Edition (PCL-5) in Veterans.

Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults.

Briere, J., Agee, E., & Dietrich, A. (2016). Cumulative trauma and current posttraumatic stress disorder status in general population and inmate samples. *Psychological Trauma: Theory, Research, Practice, and Policy*, *8*(4), 439.

Briere, J., & Rickards, S. (2007). Self-awareness, affect regulation, and relatedness: Differential sequels of childhood versus adult victimization experiences. *The Journal of nervous and mental disease*, *195*(6), 497-503.

Brink J.H., Doherty D., Boer A., (2001). Mental disorder in federal offenders: a Canadian prevalence study. *International Journal of Law and Psychiatry* 24: 4–5, 339–356.

Browne, R., Karatzias, T., & MacBeth A., (2017). A systematic review of the proposed ICD-11 CPTSD diagnosis, in preparation.

Calkins, S. D., & Hill, A. (2007). Caregiver influences on emerging emotion regulation. *Handbook of emotion regulation*, *229248*.

Cauffman, E., Feldman, S., Watherman, J., & Steiner, H. (1998). Posttraumatic stress disorder among female juvenile offenders. *Journal of the American Academy of Child & Adolescent Psychiatry*, *37*(11), 1209-1216.

Cloitre, M., Courtois, C. A., Charuvastra, A., Carapezza, R., Stolbach, B. C., & Green, B. L. (2012). Treatment of complex PTSD: Results of the ISTSS expert clinician survey on best practices. *Journal of traumatic stress*, *24*(6), 615-627.

Cloitre, M., Garvert, D. W., Brewin, C. R., Bryant, R. A., & Maercker, A. (2013). Evidence for proposed ICD-11 PTSD and complex PTSD: A latent profile analysis. *European journal of psychotraumatology*, *4*(1), 20706.

Cloitre, M., Koenen, K. C., Cohen, L. R., & Han, H. (2002). Skills training in affective and interpersonal regulation followed by exposure: a phase-based treatment for PTSD related to childhood abuse. *Journal of consulting and clinical psychology*, *70*(5), 1067.

Cloitre, M., Miranda, R., Stovall-McClough, K. C., & Han, H. (2005). Beyond PTSD: Emotion regulation and interpersonal problems as predictors of functional impairment in survivors of childhood abuse. *Behavior Therapy*, *36*(2), 119-124.

Cloitre, M., Scarvalone, P., & Difede, J. (1997). Posttraumatic stress disorder, self-and interpersonal dysfunction among sexually retraumatized women. *Journal of traumatic stress*, *10*(3), 437-452.

Cloitre, M., Stovall-McClough, K. C., Miranda, R., & Chemtob, C. M. (2004). Therapeutic alliance, negative mood regulation, and treatment outcome in child abuse-related posttraumatic stress disorder. *Journal of consulting and clinical psychology*, *72*(3), 411-415.

Cloitre, M., Stovall-McClough, C., Zorbas, P., & Charuvastra, A. (2008). Attachment organization, emotion regulation, and expectations of support in a clinical sample of women with childhood abuse histories. *Journal of Traumatic Stress*, *21*(3), 282-289.

Cole, P. M., Michel, M. K., & Teti, L. O. D. (1994). The development of emotion regulation and dysregulation: A clinical perspective. *Monographs of the society for research in child development*, *59*(2-3), 73-102.

Crewe, B. (2014). Not looking hard enough: Masculinity, emotion, and prison research. *Qualitative Inquiry*, *20*(4), 392-403.

Day, A. (2009). Offender emotion and self-regulation: Implications for offender rehabilitation programming. *Psychology, Crime & Law*, *15*(2-3), 119-130.

De Viggiani, N. (2012). Trying to be something you are not: Masculine performances within a prison setting. *Men and Masculinities*, *15*(3), 271-291.

Easton, S. D. (2013). Disclosure of child sexual abuse among adult male survivors. *Clinical Social Work Journal*, *41*(4), 344-355.

Easton, S. D., Saltzman, L. Y., & Willis, D. G. (2014). Would you tell under circumstances like that?": Barriers to disclosure of child sexual abuse for men. *Psychology of Men & Masculinity*, *15*(4), 460-469.

Easton, S. D., Coohey, C., Rhodes, A. M., & Moorthy, M. V. (2013). Posttraumatic growth among men with histories of child sexual abuse. *Child maltreatment*, *18*(4), 211-220.

Ehring, T., & Quack, D. (2010). Emotion regulation difficulties in trauma survivors: The role of trauma type and PTSD symptom severity. *Behavior therapy*, *41*(4), 587-598.

Fazel, S., & Danesh, J. (2002). Serious mental disorder in 23 000 prisoners: a systematic review of 62 surveys. *The lancet*, *359*(9306), 545-550.

Ford, J. D., Chapman, J., Connor, D. F., & Cruise, K. R. (2012). Complex trauma and aggression in secure juvenile justice settings. *Criminal Justice and Behavior*, *39*(6), 694-724.

Frewen, P. A., Dozois, D. J., Neufeld, R. W., & Lanius, R. A. (2008). Meta-analysis of alexithymia in posttraumatic stress disorder. *Journal of traumatic stress*, *21*(2), 243-246.

Galdas, P. M., Cheater, F., & Marshall, P. (2005). Men and health help-seeking behaviour: literature review. *Journal of advanced nursing*, *49*(6), 616-623.

Goff, A., Rose, E., Rose, S., & Purves, D. (2007). Does PTSD occur in sentenced prison populations? A systematic literature review. *Criminal Behaviour and Mental Health*, *17*(3), 152-162.

Grann, M., & Wedin, I. (2002). Risk factors for recidivism among spousal assault and spousal homicide offenders. *Psychology, Crime and Law*, *8*(1), 5-23.

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of psychopathology and behavioral assessment*, *26*(1), 41-54.

Gray, M. J., Litz, B. T., Hsu, J. L., & Lombardo, T. W. (2004). Psychometric properties of the life events checklist. *Assessment*, *11*(4), 330-341.

Grella, C. E., & Greenwell, L. (2007). Treatment needs and completion of community-based aftercare among substance-abusing women offenders. *Women's Health Issues*, *17*(4), 244-255.

Gross, J. J., & Thompson, R. A. (2007). Emotion regulation: Conceptual foundations.

Herman, J. (1992). Trauma and recovery: The aftermath of violence – from domestic abuse to political terror. New York: Basic Books.

Hesse, M., & Moran, P. (2010). Screening for personality disorder with the Standardised Assessment of Personality: Abbreviated Scale (SAPAS): further evidence of concurrent validity. *BMC psychiatry*, *10*(1), 10.

Hodas, G. R. (2006). Responding to childhood trauma: The promise and practice of trauma informed care. *Pennsylvania Office of Mental Health and Substance Abuse Services*, 1-77.

Howard, R., Karatzias, T., Power, K., & Mahoney, A. (2017). Posttraumatic stress disorder (PTSD) symptoms mediate the relationship between substance misuse and violent offending among female prisoners. *Social psychiatry and psychiatric epidemiology*, *52*(1), 21-25.

Jacoby, J. E., & Kozie-Peak, B. (1997). The benefits of social support for mentally ill offenders: Prison-to-community transitions. *Behavioral Sciences and the Law*, *15*, 483-502.

Jongh, A., Resick, P. A., Zoellner, L. A., Minnen, A., Lee, C. W., Monson, C. M., ... & Rauch, S. A. (2016). Critical analysis of the current treatment guidelines for complex PTSD in adults. *Depression and anxiety*, *33*(5), 359-369.

Karatzias (2005). *Prevalence of PTSD in a female prison population.* Manuscript in preperation.

Karatzias, T., Shevlin, M., Fyvie, C., Hyland, P., Efthymiadou, E., Wilson, D., ... & Cloitre, M. (2017). Evidence of distinct profiles of Posttraumatic Stress Disorder (PTSD) and Complex Posttraumatic Stress Disorder (CPTSD) based on the new ICD-11 Trauma Questionnaire (ICD-TQ). *Journal of affective disorders*, *207*, 181-187.

Kashdan, T. B., Morina, N., & Priebe, S. (2009). Post-traumatic stress disorder, social anxiety disorder, and depression in survivors of the Kosovo War: Experiential avoidance as a contributor to distress and quality of life. *Journal of anxiety disorders*, *23*(2), 185-196.

Kessler, R. C. (2000). Posttraumatic stress disorder: the burden to the individual and to society. *The Journal of clinical psychiatry*.

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of general psychiatry*, *62*(6), 593-602.

Laffaye, C., Cavella, S., Drescher, K., & Rosen, C. (2008). Relationships among PTSD symptoms, social support, and support source in veterans with chronic PTSD. *Journal of Traumatic Stress*, *21*(4), 394-401.

Laws, B., & Crewe, B. (2016). Emotion regulation among male prisoners. *Theoretical Criminology*, *20*(4), 529-547.

Leigh-Hunt, N., & Perry, A. (2015). A systematic review of interventions for anxiety, depression, and PTSD in adult offenders. *International journal of offender therapy and comparative criminology*, *59*(7), 701-725.

Marx, B. P., & Sloan, D. M. (2005). Peritraumatic dissociation and experiential avoidance as predictors of posttraumatic stress symptomatology. *Behaviour research and therapy*, *43*(5), 569-583.

Maercker, A., Brewin, C. R., Bryant, R. A., Cloitre, M., Reed, G. M., van Ommeren, et al.(2013). Proposals for mental disorders specifically associated with stress in the International Classification of Diseases-11. *The Lancet*, *381*(9878), 1683-1685.

Miller, N. A., & Najavits, L. M. (2012). Creating trauma-informed correctional care: a balance of goals and environment. *European Journal of Psychotraumatology*, *3*.

Moran, P., Leese, M., Lee, T., Walters, P., Thornicroft, G., & Mann, A. (2003). Standardised Assessment of Personality–Abbreviated Scale (SAPAS): preliminary validation of a brief screen for personality disorder. *The british journal of psychiatry*, *183*(3), 228-232.

Nightingale, J., & Williams, R. M. (2000). Attitudes to emotional expression and personality in predicting post-traumatic stress disorder. *British Journal of Clinical Psychology*, *39*(3), 243-254.

Olff, M., Langeland, W., Draijer, N., & Gersons, B. P. (2007). Gender differences in posttraumatic stress disorder. *Psychological bulletin*, *133*(2), 183.

Osborne, J. W., & Waters, E. (2002). 1 Four Assumptions Of Multiple Regression That Researchers Should Always Test.

Ozer, E. J., Best, S. R., Lipsey, T. L., & Weiss, D. S. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: a meta-analysis. *Psychological bulletin*, *129*(1), 52.

Roemer, L., Litz, B. T., Orsillo, S. M., & Wagner, A. W. (2001). A preliminary investigation of the role of strategic withholding of emotions in PTSD. *Journal of Traumatic Stress*, *14*(1), 149-156.

Roberton, T., Daffern, M., & Bucks, R. S. (2012). Emotion regulation and aggression. *Aggression and violent behavior*, *17*(1), 72-82.

Sarchiapone, M., Carli, V., Cuomo, C., Marchetti, M., & Roy, A. (2009). Association between childhood trauma and aggression in male prisoners. *Psychiatry research*, *165*(1), 187-192.

Scottish Prison Service (2015). From Vision to Reality – Transforming Scotland's Care of Women In Custody. Retrieved from: http://www.sps.gov.uk/Corporate/Information/Women-In-Custody.aspx

Shonin, E., Van Gordon, W., Slade, K., & Griffiths, M. D. (2013). Mindfulness and other Buddhist-derived interventions in correctional settings: A systematic review. *Aggression and Violent Behavior*, *18*(3), 365-372.

Soldz, S., Budman, S., Demby, A., & Merry, J. (1995). A short form of the inventory of interpersonal problems circumples scales. *Assessment*, *2*(1), 53-63.

Steiner, H., Garcia, I. G., & Matthews, Z. (1997). Posttraumatic stress disorder in incarcerated juvenile delinquents. *Journal of the American Academy of Child & Adolescent Psychiatry*, *36*(3), 357-365.

Timmerman, I. G., & Emmelkamp, P. M. (2001). The relationship between traumatic experiences, dissociation, and borderline personality pathology among male forensic patients and prisoners. *Journal of personality disorders*, *15*(2), 136-149.

Tolin, D. F., & Foa, E. B. (2006). Sex differences in trauma and posttraumatic stress disorder: a quantitative review of 25 years of research. *Psychological bulletin*, *132*(6), 959.

U.S. Department of Veterans Affairs. (2017). *PTSD: National Centre for PTSD*. Life Events Checklist for DSM-5. Retrieved from https://www.ptsd.va.gov/professional/assessment/te-measures/life_events_checklist.asp

Van der Kolk, B. A., Hostetler, A., Herron, N., & Fisler, R. E. (1994). Trauma and the development of borderline personality disorder. *Psychiatric Clinics of North America*.

Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). The PTSD Checklist for DSM-5 (PCL-5). *Scale available from the National Center for PTSD. www.ptsd.va.gov*.

Weeks, R., & Widom, C. S. (1998). Self-reports of early childhood victimization among incarcerated adult male felons. *Journal of interpersonal violence*, *13*(3), 346-361.

Wolff, N., Blitz, C. L., Shi, J., Siegel, J., & Bachman, R. (2007). Physical violence inside prisons: Rates of victimization. *Criminal justice and behavior*, *34*(5), 588-599.

List of appendices

Appendix A Journal submission guidelines for Clinical Psychology Review …….78

Appendix B Journal submission Guidelines for the Journal of traumatic Stress……..92

Appendix C Search Strategy ……99

Appendix D Quality Criteria ……..100

Appendix E Types of statistical analysis used in the studies ……110

Appendix F – Fit indices for the individual studies ……111

Appendix G Ethical Approval……..…120

Appendix H Original study proposal for the University of Edinburgh ……..124

Appendix I Original study protocol ……149

Appendix A Journal submission guidelines for Clinical Psychology Review

CLINICAL PSYCHOLOGY REVIEW

AUTHOR INFORMATION PACK

TABLE OF CONTENTS XXX

- **Description p.1**
- **Audience p.1**
- **Impact Factor p.1**
- **Abstracting and Indexing p.2**
- **Editorial Board p.2**
- **Guide for Authors p.3**

ISSN: 0272-7358

DESCRIPTION

Clinical Psychology Review publishes substantive reviews of topics germane to **clinical psychology**. Papers cover diverse issues including: psychopathology, psychotherapy, behavior therapy, cognition and cognitive therapies, behavioral medicine, community mental health, assessment, and child development. Papers should be cutting edge and advance the science and/or practice of clinical psychology.

Reviews on other topics, such as psychophysiology, learning therapy, experimental psychopathology, and social psychology often appear if they have a clear relationship to research or practice in **clinical psychology**. Integrative literature reviews and summary reports of innovative ongoing clinical research programs are also sometimes published. Reports on individual research studies and theoretical treatises or clinical guides without an empirical base are not appropriate.

Benefits to authors

We also provide many author benefits, such as free PDFs, a liberal copyright policy, special discounts on Elsevier publications and much more. Please click here for more information on our author services.

Please see our Guide for Authors for information on article submission. If you require any further information or help, please visit our Support Center

AUDIENCE

Psychologists and Clinicians in Psychopathy

IMPACT FACTOR

2015: 8.146 © Thomson Reuters Journal Citation Reports 2016

ABSTRACTING AND INDEXING

Google Scholar®

BIOSIS

Current Contents/Social & Behavioral Sciences

MEDLINE®

EMBASE

PsycINFO

Scopus

EDITORIAL BOARD

GUIDE FOR AUTHORS

Submission checklist

You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

Ensure that the following items are present:

One author has been designated as the corresponding author with contact details:

- E-mail address
- Full postal address

All necessary files have been uploaded:

Manuscript:

- Include keywords
- All figures (include relevant captions)
- All tables (including titles, description, footnotes)
- Ensure all figure and table citations in the text match the files provided
- Indicate clearly if color should be used for any figures in print

Graphical Abstracts / Highlights files (where applicable)
Supplemental files (where applicable)

Further considerations

- Manuscript has been 'spell checked' and 'grammar checked'
- All references mentioned in the Reference List are cited in the text, and vice versa
- Permission has been obtained for use of copyrighted material from other sources (including theInternet)
- Relevant declarations of interest have been made
- Journal policies detailed in this guide have been reviewed
- Referee suggestions and contact details provided, based on journal requirements

For further information, visit our Support Center.

BEFORE YOU BEGIN

Ethics in publishing

Please see our information pages on Ethics in publishing and Ethical guidelines for journal publication.

Declaration of interest

All authors are requested to disclose any actual or potential conflict of interest including any financial, personal or other relationships with other people or organizations within three years of beginning the submitted work that could inappropriately influence, or be perceived to influence, their work. More information.

Submission declaration and verification

Submission of an article implies that the work described has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis or as an electronic preprint, see 'Multiple, redundant or concurrent publication' section of our ethics policy for more information), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. To verify originality, your article may be checked by the originality detection service CrossCheck.

Changes to authorship

Authors are expected to consider carefully the list and order of authors **before** submitting their manuscript and provide the definitive list of authors at the time of the original submission. Any addition, deletion or rearrangement of author names in the authorship list should be made only **before** the manuscript has been accepted and only if approved by the journal Editor. To request such a change, the Editor must receive the following from the **corresponding author**: (a) the reason for the change in author list and (b) written confirmation (e-mail, letter) from all authors that they agree with the addition, removal or rearrangement. In the case of addition or removal of authors, this includes confirmation from the author being added or removed.

Only in exceptional circumstances will the Editor consider the addition, deletion or rearrangement of authors **after** the manuscript has been accepted. While the Editor considers the request, publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.

Author Disclosure Policy

Authors must provide three mandatory and one optional author disclosure statements. These statements should be submitted as one separate document and not included as part of the manuscript.

Author disclosures will be automatically incorporated into the PDF builder of the online submission system. They will appear in the journal article if the manuscript is accepted.

The four statements of the author disclosure document are described below. Statements should not be numbered. Headings (i.e., Role of Funding Sources, Contributors, Conflict of Interest, Acknowledgements) should be in bold with no white space between the heading and the text. Font size should be the same as that used for references.

Statement 1: Role of Funding Sources

Authors must identify who provided financial support for the conduct of the research and/or preparation of the manuscript and to briefly describe the role (if any) of the funding sponsor in study design, collection, analysis, or interpretation of data, writing the manuscript, and the decision to submit the manuscript for publication. If the funding source had no such involvement, the authors should so state.

Example: Funding for this study was provided by NIAAA Grant R01-AA123456. NIAAA had no role in the study design, collection, analysis or interpretation of the data, writing the manuscript, or the decision to submit the paper for publication.

Statement 2: Contributors

Authors must declare their individual contributions to the manuscript. All authors must have materially participated in the research and/or the manuscript preparation. Roles for each author should be described. The disclosure must also clearly state and verify that all authors have approved the final manuscript.

Example: Authors A and B designed the study and wrote the protocol. Author C conducted literature searches and provided summaries of previous research studies. Author D conducted the statistical analysis. Author B wrote the first draft of the manuscript and all authors contributed to and have approved the final manuscript.

Statement 3: Conflict of Interest

All authors must disclose any actual or potential conflict of interest. Conflict of interest is defined as any financial or personal relationships with individuals or organizations, occurring within three (3) years of beginning the submitted work, which could inappropriately influence, or be perceived to have influenced the submitted research manuscript. Potential conflict of interest would include employment, consultancies, stock ownership (except personal investments equal to the lesser of one percent (1%) of total personal investments or USD$5000), honoraria, paid expert testimony, patent applications, registrations, and grants. If there are no conflicts of interest by any author, it should state that there are none.

Example: Author B is a paid consultant for XYZ pharmaceutical company. All other authors declare that they have no conflicts of interest.

Statement 4: Acknowledgements (optional)

Authors may provide Acknowledgments which will be published in a separate section along with the manuscript. If there are no Acknowledgements, there should be no heading or acknowledgement statement.

Example: The authors wish to thank Ms. A who assisted in the proof-reading of the manuscript.

Copyright

Upon acceptance of an article, authors will be asked to complete a 'Journal Publishing Agreement' (see more information on this). An e-mail will be sent to the corresponding author confirming receipt of the manuscript together with a 'Journal Publishing Agreement' form or a link to the online version of this agreement.

Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. Permission of the Publisher is required for resale or distribution outside the institution and for all other derivative works, including compilations and translations. If excerpts from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the article. Elsevier has preprinted forms for use by authors in these cases.

For open access articles: Upon acceptance of an article, authors will be asked to complete an 'Exclusive License Agreement' (more information). Permitted third party reuse of open access articles is determined by the author's choice of user license.

Author rights

As an author you (or your employer or institution) have certain rights to reuse your work. More information.

Elsevier supports responsible sharing

Find out how you can share your research published in Elsevier journals.

Role of the funding source

You are requested to identify who provided financial support for the conduct of the research and/or preparation of the article and to briefly describe the role of the sponsor(s), if any, in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication. If the funding source(s) had no such involvement then this should be stated.

Funding body agreements and policies

Elsevier has established a number of agreements with funding bodies which allow authors to comply with their funder's open access policies. Some funding bodies will reimburse the author for the Open Access Publication Fee. Details of existing agreements are available online.

Open access

This journal offers authors a choice in publishing their research:

Open access

- Articles are freely available to both subscribers and the wider public with permitted reuse.
- An open access publication fee is payable by authors or on their behalf, e.g. by their research funderor institution.

Subscription

- Articles are made available to subscribers as well as developing countries and patient groups through our universal access programs.
- No open access publication fee payable by authors.

Regardless of how you choose to publish your article, the journal will apply the same peer review criteria and acceptance standards.

For open access articles, permitted third party (re)use is defined by the following Creative Commons user licenses:

Creative Commons Attribution (CC BY)
Lets others distribute and copy the article, create extracts, abstracts, and other revised versions, adaptations or derivative works of or from an article (such as a translation), include in a collective work (such as an anthology), text or data mine the article, even for commercial purposes, as long as they credit the author(s), do not represent the author as endorsing their adaptation of the article, and do not modify the article in such a way as to damage the author's honor or reputation.

Creative Commons Attribution-NonCommercial-NoDerivs (CC BY-NC-ND)
For non-commercial purposes, lets others distribute and copy the article, and to include in a collective work (such as an anthology), as long as they credit the author(s) and provided they do not alter or modify the article.

The open access publication fee for this journal is **USD 1800**, excluding taxes. Learn more about Elsevier's pricing policy: http://www.elsevier.com/openaccesspricing.

Green open access
Authors can share their research in a variety of different ways and Elsevier has a number of green open access options available. We recommend authors see our green open access page for further information. Authors can also self-archive their manuscripts immediately and enable public access from their institution's repository after an embargo period. This is the version that has been accepted for publication and which typically includes author-incorporated changes suggested during submission, peer review and in editor-author communications. Embargo period: For subscription articles, an appropriate amount of time is needed for journals to deliver value to subscribing customers before an article becomes freely available to the public. This is the embargo period and it begins from the date the article is formally published online in its final and fully citable form. Find out more.

This journal has an embargo period of 24 months.

Elsevier Publishing Campus
The Elsevier Publishing Campus (www.publishingcampus.com) is an online platform offering free lectures, interactive training and professional advice to support you in publishing your research. The College of Skills training offers modules on how to prepare, write and structure your article and explains how editors will look at your paper when it is submitted for publication. Use these resources, and more, to ensure that your submission will be the best that you can make it.

Language (usage and editing services)
Please write your text in good English (American or British usage is accepted, but not a mixture of these). Authors who feel their English language manuscript may require editing to eliminate possible

grammatical or spelling errors and to conform to correct scientific English may wish to use the English Language Editing service available from Elsevier's WebShop.

Submission

Our online submission system guides you stepwise through the process of entering your article details and uploading your files. The system converts your article files to a single PDF file used in the peer-review process. Editable files (e.g., Word, LaTeX) are required to typeset your article for final publication. All correspondence, including notification of the Editor's decision and requests for revision, is sent by e-mail.

PREPARATION

Use of word processing software

It is important that the file be saved in the native format of the word processor used. The text should be in single-column format. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. In particular, do not use the word processor's options to justify text or to hyphenate words. However, do use bold face, italics, subscripts, superscripts etc. When preparing tables, if you are using a table grid, use only one grid for each individual table and not a grid for each row. If no grid is used, use tabs, not spaces, to align columns. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the Guide to Publishing with Elsevier). Note that source files of figures, tables and text graphics will be required whether or not you embed your figures in the text. See also the section on Electronic artwork.

To avoid unnecessary errors you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

Article structure

Manuscripts should be prepared according to the guidelines set forth in the Publication Manual of the American Psychological Association (6th ed., 2009). Of note, section headings should not be numbered.

Manuscripts should ordinarily not exceed 50 pages, *including* references and tabular material. Exceptions may be made with prior approval of the Editor in Chief. Manuscript length can often be managed through the judicious use of appendices. In general the References section should be limited to citations actually discussed in the text. References to articles solely included in meta-analyses should be included in an appendix, which will appear in the on line version of the paper but not in the print copy. Similarly, extensive Tables describing study characteristics, containing material published elsewhere, or presenting formulas and other technical material should also be included in an appendix. Authors can direct readers to the appendices in appropriate places in the text.

It is authors' responsibility to ensure their reviews are comprehensive and as up to date as possible (at least through the prior calendar year) so the data are still current at the time of publication. Authors are referred to the PRISMA Guidelines (http://www.prisma-statement.org/statement.htm) for guidance in conducting reviews and preparing manuscripts. Adherence to the Guidelines is not required, but is recommended to enhance quality of submissions and impact of published papers on the field.

Appendices

If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

Essential title page information

Title. Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible. **Note: The title page should be the first page of the manuscript document indicating the author's names and affiliations and the corresponding author's complete contact information.**

Author names and affiliations. Where the family name may be ambiguous (e.g., a double name), please indicate this clearly. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name, and, if available, the e-mail address of each author within the cover letter.

Corresponding author. Clearly indicate who is willing to handle correspondence at all stages of refereeing and publication, also post-publication. **Ensure that telephone and fax numbers (with country and area code) are provided in addition to the e-mail address and the complete postal address.**

Present/permanent address. If an author has moved since the work described in the article was done, or was visiting at the time, a "Present address"' (or "Permanent address") may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

Abstract

A concise and factual abstract is required (not exceeding 200 words). This should be typed on a separate page following the title page. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separate from the article, so it must be able to stand alone. References should therefore be avoided, but if essential, they must be cited in full, without reference to the reference list.

Graphical abstract

Although a graphical abstract is optional, its use is encouraged as it draws more attention to the online article. The graphical abstract should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: Please provide an image with a minimum of 531 × 1328 pixels (h × w) or proportionally more. The image should be readable at a size of 5 × 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files. You can view Example Graphical Abstracts on our information site.

Authors can make use of Elsevier's Illustration and Enhancement service to ensure the best presentation of their images and in accordance with all technical requirements: Illustration Service.

Highlights

Highlights are mandatory for this journal. They consist of a short collection of bullet points that convey the core findings of the article and should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point). You can view example Highlights on our information site.

Keywords

Immediately after the abstract, provide a maximum of 6 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

Abbreviations

Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

Formatting of funding sources

List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, please include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Footnotes

Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors can build footnotes into the text, and this feature may be used. Otherwise, please indicate the position of footnotes in the text and list the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list.

Electronic artwork General points

- Make sure you use uniform lettering and sizing of your original artwork.
- Embed the used fonts if the application provides that option.
- Aim to use the following fonts in your illustrations: Arial, Courier, Times New Roman, Symbol, oruse fonts that look similar.

- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Provide captions to illustrations separately.
- Size the illustrations close to the desired dimensions of the published version.
- Submit each illustration as a separate file.

A detailed guide on electronic artwork is available.

You are urged to visit this site; some excerpts from the detailed information are given here. *Formats*

If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply 'as is' in the native document format.

Regardless of the application used other than Microsoft Office, when your electronic artwork is finalized, please 'Save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):

EPS (or PDF): Vector drawings, embed all used fonts.

TIFF (or JPEG): Color or grayscale photographs (halftones), keep to a minimum of 300 dpi.

TIFF (or JPEG): Bitmapped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi. TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale), keep to a minimum of 500 dpi.

Please do not:

- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have alow number of pixels and limited set of colors;
- Supply files that are too low in resolution;
- Submit graphics that are disproportionately large for the content.

Color artwork

Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF), or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color online (e.g., ScienceDirect and other sites) regardless of whether or not these illustrations are reproduced in color in the printed version. **For color reproduction in print, you will receive information regarding the costs from Elsevier after receipt of your accepted article**. Please indicate your preference for color: in print or online only. Further information on the preparation of electronic artwork.

Figure captions

Ensure that each illustration has a caption. Supply captions separately, not attached to the figure. A caption should comprise a brief title (**not** on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

Tables

Please submit tables as editable text and not as images. Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of

tables and ensure that the data presented in them do not duplicate results described elsewhere in the article. Please avoid using vertical rules and shading in table cells.

References

Citations in the text should follow the referencing style used by the American Psychological Association. You are referred to the Publication Manual of the American Psychological Association, Sixth Edition, ISBN 1-4338-0559-6, copies of which may be ordered from http://books.apa.org/books.cfm?id=4200067 or APA Order Dept., P.O.B. 2710, Hyattsville, MD 20784, USA or APA, 3 Henrietta Street, London, WC3E 8LU, UK. Details concerning this referencing style can also be found at http://humanities.byu.edu/linguistics/Henrichsen/APA/APA01.html

Citation in text

Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

Web references

As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.

Data references

This journal encourages you to cite underlying or relevant datasets in your manuscript by citing them in your text and including a data reference in your Reference List. Data references should include the following elements: author name(s), dataset title, data repository, version (where available), year, and global persistent identifier. Add [dataset] immediately before the reference so we can properly identify it as a data reference. The [dataset] identifier will not appear in your published article.

References in a special issue

Please ensure that the words 'this issue' are added to any references in the list (and any citations in the text) to other articles in the same Special Issue.

Reference management software

Most Elsevier journals have their reference template available in many of the most popular reference management software products. These include all products that support Citation Style Language styles, such as Mendeley and Zotero, as well as EndNote. Using the word processor plug-ins from these products, authors only need to select the appropriate journal template when preparing their article, after which citations and bibliographies will be automatically formatted in the journal's style. If no template is yet available for this journal, please follow the format of the sample references and citations as shown in this Guide.

Users of Mendeley Desktop can easily install the reference style for this journal by clicking the following link:

http://open.mendeley.com/use-citation-style/clinical-psychology-review
When preparing your manuscript, you will then be able to select this style using the Mendeley plugins for Microsoft Word or LibreOffice.

Reference style

References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters "a", "b", "c", etc., placed after the year of publication. **References should be formatted with a hanging indent (i.e., the first line of each reference is flush left while the subsequent lines are indented).**

Examples: Reference to a journal publication: Van der Geer, J., Hanraads, J. A. J., & Lupton R. A. (2000). The art of writing a scientific article. *Journal of Scientific Communications,* 163, 51-59.

Reference to a book: Strunk, W., Jr., &White, E. B. (1979). *The elements of style.* (3rd ed.). New York: Macmillan, (Chapter 4).

Reference to a chapter in an edited book: Mettam, G. R., & Adams, L. B. (1994). How to prepare an electronic version of your article. In B.S. Jones, & R. Z. Smith (Eds.), *Introduction to the electronic age* (pp. 281-304). New York: E-Publishing Inc.

[dataset] Oguro, M., Imahiro, S., Saito, S., Nakashizuka, T. (2015). *Mortality data for Japanese oak wilt disease and surrounding forest compositions.* Mendeley Data, v1. http://dx.doi.org/10.17632/ xwj98nb39r.1

Video

Elsevier accepts video material and animation sequences to support and enhance your scientific research. Authors who have video or animation files that they wish to submit with their article are strongly encouraged to include links to these within the body of the article. This can be done in the same way as a figure or table by referring to the video or animation content and noting in the body text where it should be placed. All submitted files should be properly labeled so that they directly relate to the video file's content. In order to ensure that your video or animation material is directly usable, please provide the files in one of our recommended file formats with a preferred maximum size of 150 MB. Video and animation files supplied will be published online in the electronic version of your article in Elsevier Web products, including ScienceDirect. Please supply 'stills' with your files: you can choose any frame from the video or animation or make a separate image. These will be used instead of standard icons and will personalize the link to your video data. For more detailed instructions please visit our video instruction pages. Note: since video and animation cannot be embedded in the print version of the journal, please provide text for both the electronic and the print version for the portions of the article that refer to this content.

Supplementary material

Supplementary material such as applications, images and sound clips, can be published with your article to enhance it. Submitted supplementary items are published exactly as they are received (Excel or PowerPoint files will appear as such online). Please submit your material together with the article and

supply a concise, descriptive caption for each supplementary file. If you wish to make changes to supplementary material during any stage of the process, please make sure to provide an updated file. Do not annotate any corrections on a previous version. Please switch off the 'Track Changes' option in Microsoft Office files as these will appear in the published version.

ARTICLE ENRICHMENTS AudioSlides

The journal encourages authors to create an AudioSlides presentation with their published article. AudioSlides are brief, webinar-style presentations that are shown next to the online article on ScienceDirect. This gives authors the opportunity to summarize their research in their own words and to help readers understand what the paper is about. More information and examples are available. Authors of this journal will automatically receive an invitation e-mail to create an AudioSlides presentation after acceptance of their paper.

3D neuroimaging

You can enrich your online articles by providing 3D neuroimaging data in NIfTI format. This will be visualized for readers using the interactive viewer embedded within your article, and will enable them to: browse through available neuroimaging datasets; zoom, rotate and pan the 3D brain reconstruction; cut through the volume; change opacity and color mapping; switch between 3D and 2D projected views; and download the data. The viewer supports both single (.nii) and dual (.hdr and .img) NIfTI file formats. Recommended size of a single uncompressed dataset is maximum 150 MB. Multiple datasets can be submitted. Each dataset will have to be zipped and uploaded to the online submission system via the '3D neuroimaging data' submission category. Please provide a short informative description for each dataset by filling in the 'Description' field when uploading a dataset. Note: all datasets will be available for downloading from the online article on ScienceDirect. If you have concerns about your data being downloadable, please provide a video instead. More information.

Interactive plots

This journal enables you to show an Interactive Plot with your article by simply submitting a data file. Full instructions.

AFTER ACCEPTANCE

Online proof correction

Corresponding authors will receive an e-mail with a link to our online proofing system, allowing annotation and correction of proofs online. The environment is similar to MS Word: in addition to editing text, you can also comment on figures/tables and answer questions from the Copy Editor. Web-based proofing provides a faster and less error-prone process by allowing you to directly type your corrections, eliminating the potential introduction of errors.

If preferred, you can still choose to annotate and upload your edits on the PDF version. All instructions for proofing will be given in the e-mail we send to authors, including alternative methods to the online version and PDF.

We will do everything possible to get your article published quickly and accurately. Please use this proof only for checking the typesetting, editing, completeness and correctness of the text, tables and figures. Significant changes to the article as accepted for publication will only be considered at this stage with permission from the Editor. It is important to ensure that all corrections are sent back to us in one

communication. Please check carefully before replying, as inclusion of any subsequent corrections cannot be guaranteed. Proofreading is solely your responsibility.

Offprints

The corresponding author will, at no cost, receive a customized Share Link providing 50 days free access to the final published version of the article on ScienceDirect. The Share Link can be used for sharing the article via any communication channel, including email and social media. For an extra charge, paper offprints can be ordered via the offprint order form which is sent once the article is accepted for publication. Both corresponding and co-authors may order offprints at any time via Elsevier's Webshop. Corresponding authors who have published their article open access do not receive a Share Link as their final published version of the article is available open access on ScienceDirect and can be shared through the article DOI link.

AUTHOR INQUIRIES

Visit the Elsevier Support Center to find the answers you need. Here you will find everything from Frequently Asked Questions to ways to get in touch.

You can also check the status of your submitted article or find out when your accepted article will be published.

Appendix B Journal submission Guidelines for the Journal of traumatic Stress

Author Guidelines

1. **Online Submissions:** The *Journal of Traumatic Stress* accepts submission of manuscripts online at:

   http://mc.manuscriptcentral.com/jots

   Information about how to create an account or submit a manuscript may be found online on the Manuscript Central homepage in the "User Tutorials" section or, on the Author Dashboard, via the "Help" menu in the upper right corner of the screen. Personal assistance also is available by calling 434-964-4100.

2. **Article Formats:** Three article formats are accepted for consideration by JTS. All page counts should include references, tables, and figures. *Regular articles* (30 pages maximum, inclusive of all text, abstract, references, tables, and figures) include research studies, quantitative systematic reviews, and theoretical articles. Purely descriptive articles or narrative-based literature reviews are rarely accepted. In extraordinary circumstances, the editors may consider longer manuscripts that describe highly complex designs or statistical procedures but authors should seek approval prior to submitting manuscripts longer than 30 pages. *Brief reports* (18 pages maximum) are appropriate for pilot studies or uncontrolled trials of an intervention, preliminary data on a new problem or population, condensed findings from a study that does not merit a full article, or methodologically oriented papers that replicate findings in new populations or report preliminary data on new instruments. *Commentaries* (1,000 words or less) involve responses to previously published articles or, occasionally, invited essays on a professional or scientific topic of general interest. Response commentaries, submitted no later than 8 weeks after the original article is published (12 weeks if outside the U.S.), must be content-directed and use tactful language. The original author is given the opportunity to respond to accepted commentaries.

3. **Double-Blind Review:** As of January 1, 2017, the Journal of Traumatic Stress utilizes a double-blind review process in which reviewers receive manuscripts with no authors' names or affiliations listed in order to ensure unbiased review. To facilitate blinded review, the title page should be uploaded as a separate document from the body of the manuscript, identified as "Title Page," and should include the title of the article, the running head (maximum 50 characters) in uppercase flush left, author(s) byline and institutional affiliation, and author note (see pp. 23-25 of the APA 6th ed. manual). Within the main body of the manuscript, tables, and figures, authors should ensure that any identifying information (i.e., author names, affiliations, institutions where the work was performed, university whose ethics committee approved the project) is blinded; a simple way to accomplish this is by replacing the identifying text with the phrase "[edited out for blind review]". In addition, language should be used that avoids revealing the identity of the authors; e.g., rather than stating, "In other research by our lab (Bennett & Kerig, 2014), we found …" use phrases such as, "In a previous study, Bennett and Kerig (2014) found …" Please note that if you have uploaded the files correctly, you will **not** be able to view the title page in the PDF and HTML proofs of your manuscript; however, the Editor and JTS editorial office staff can view this information.

4. **Preferred and Non-Preferred Reviewers:** During the submission process, authors may suggest the names of preferred reviewers; authors also may request that specific individuals not be selected as reviewers.
5. **Publication Style:** JTS follows the style recommendations of the 2010 *Publication Manual of the American Psychological Association* (APA; 6th edition) and submitted manuscripts must conform to these formatting guidelines. Manuscripts should use non-sexist language. Manuscripts must be formatted using letter or A4 page size, with 1 inch (2.54 cm) margins on all sides, Times New Roman 12 point font (except for figures, which should be in 12 point Arial font), and double-spacing for text, tables, references, and figures. Submit your manuscript in DOC or RTF format.

   For assistance with APA style, in addition to consulting the manual itself, please note these helpful online sources that are freely available: http://www.apastyle.org/learn/tutorials/basicstutorial.aspx and https://owl.english.purdue.edu/owl/section/2/10/ .

6. **APA and JTS Style Pointers:** In addition to consulting the APA 6th edition Publication Manual, the resources indexed above, and the JTS Style Sheet posted online, please consider these pointers when formatting each section of the manuscript:

   a. **Tense:** Throughout the manuscript, please use past tense for everything that has already happened, including the collection and analyses of the data being reported.

   b. **Abstract:** The Main Document of the manuscript should begin with an abstract no longer than 250 words, placed on a separate page. In addition, JTS house style requires the reporting of an effect size for each finding discussed in the abstract; if there are many findings, present the range.

   c. **Participants:** Please include in this subsection of the Method section information on sample characteristics, subsample comparisons, and analyses that describe the sample but are not focused on testing the hypotheses that are the aims of your manuscript.

   d. **Procedure:** Please describe the procedure in sufficient detail so that it could be comprehended and replicated by another investigator. Identify by name the IRB or ethics committee (edited out for blind review in the submitted manuscript) that approved the research, and the manner in which consent was obtained.

   e. **Measures:** In addition to providing citations, psychometric, and validation data for each measure administered, please provide coefficient alpha from your data for each measure for which this is appropriate.

   f. **Data Analysis:** Include a separate subsection with this header in the Method section in which you describe the analyses performed, the software program(s) used, and make an explicit statement about missing data in your data set. If there are no missing data, so state; otherwise describe the extent of missing data and how they were handled in the data analyses.

   g. **Results** (and throughout): Please present percentages to 1 decimal place, means and *SD*s to 2 decimal places, and exact *p* values to 3 decimal places except for < .001. Include leading

zeros (e.g., 0.92) when reporting any statistic that can be greater than 1.00 (or less than -1.00). For example, there is no leading zero used when reporting correlations, coefficient alphas, standardized betas, *p* values, or fit indices (e.g., *r* = .47, not 0.47).

h. **References:** Format the references using APA 6th edition style: (a) begin the reference list on a new page following the text, (b) double-space, (c) use hanging indent format, (d) italicize the journal name or book title, and (e) list alphabetically by last name of first author. Do not include journal issue numbers unless each volume begins with page 1. If a reference has a Digital Object Identifier (doi), it must be included as the last element of the reference.

(1) ***Journal Article:***

Kraemer, H. C. (2009). Events per person-time (incidence rate): A misleading statistic? *Statistics in Medicine, 28*, 1028–1039. doi: 10.1002/sim.3525

(2) ***Book:***

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

(3) ***Book Chapter:***

Meehl, P. E. (2006). The power of quantitative thinking. In N. G. Waller, L. J. Yonce, W. M. Grove, D. Faust, & M. F. Lenzenweger (Eds.), *Essays on the practice of scientific psychology* (pp. 433–444). Mahwah, NJ: Erlbaum.

i. **Footnotes:** Footnotes should be avoided. When their use is absolutely necessary, footnotes should be formatted in APA style and placed on a separate page after the reference list and before any tables.

j. **Tables:** Tables should be formatted in APA 6th edition style and should be placed after the references in the body of the manuscript. Please use Word's Table function to construct tables, not tabs and spacing. Tables should be numbered (with Arabic numerals) and referred to by number in the text. Each table should begin on a separate page. Please make tables double-spaced, decimal align all numeric columns, and use sentence case for labels. Each datum should appear in its own cell (e.g., do not include *SDs* in parentheses following *M*s but instead create a separate column for *SD*s). When reporting a table of intercorrelations, fill the rows first and then the columns such that any empty cells are in the lower left-hand quadrant of the table; use dashes in any redundant cells indicating the correlation of a variable with itself. Please use asterisks to indicate significance levels in tables, not *p* values.

Color in tables: Color can be included in the online version of a manuscript at no charge; however use of color in the print version of the journal will incur additional charges (currently $600 per figure or table). If you wish to include color in only the online version, please ensure that each table will be legible in greyscale when it is published in the print version; for example, lines of different colors may be discriminable from one another when viewed in color but may not appear to be different from one another in greyscale.

k. **Figures:** All figures (graphs, photographs, drawings, and charts) should be numbered (with Arabic numerals) and referred to by number in the text. Each figure should begin on a separate page. Place figures captions at the bottom of the figure itself, not on a separate page. Include a separate legend to explain symbols if needed. Please use Arial font throughout except for the caption, which should remain as Times New Roman. Use sentence case for titles and labels. Figures should be in Word, TIF, or EPS format.

Color in figures: Color can be included in the online version of a manuscript at no charge; however use of color in the print version of the journal will incur additional charges (currently $600 per figure or table). If you wish to include color in only the online version, please ensure that each figure will be legible in greyscale when it is published in the print version; for example, lines of different colors may be discriminable from one another when viewed in color but may not appear to be different from one another in greyscale.

7. **Uploading Files:** After the separate Title Page has been uploaded, the remaining text (abstract, main body of the manuscript, references, and tables) should be uploaded as a **single** file designated as "Main Document." Figures may be either included in the main document or uploaded as separate files if in a non-Word format.

8. **Supplementary Materials.** Authors may wish to place some material in the separate designation of "Supplementary file not for review," which will be made available online for optional access by interested readers. This material will not be seen by reviewers and will not be taken into consideration in their evaluation of the scientific merits of the work, and will not be included in the published article. Material appropriate for such a designation includes information that is not essential to the reader's comprehension of the study design or findings, but which might be of interest to some scholars; examples might include descriptions of a series of non-significant posthoc analyses that were not central to the main hypotheses of the study, detailed information about the content of coding system categories, and CONSORT flow diagrams for randomized controlled trials (see below). Note well that the manuscript must stand on its own without this material; consequently, critical information reviewers and readers need to evaluate or replicate the study, such as the provenance and psychometric properties of the measures administered, is not appropriate for placement into Supplementary Materials.

9. **Statement of Ethical Standards:** In the conduct of their research, author(s) are required to adhere to the "Ethical Principles of Psychologists and Code of Conduct" of the American Psychological Association (visit http://www.apa.org/science/leadership/research/ethical-conduct-humans.aspx for human research or http://www.apa.org/science/leadership/care/guidelines.aspx for animal research) or equivalent guidelines in the study's country of origin. If the author(s) were unable to comply when conducting the research being presented, an explanation is required.

   All work submitted to the *Journal of Traumatic Stress* must conform to applicable governmental regulations and discipline-appropriate ethical standards. Responsibility for meeting these requirements rests with all authors. Human and animal research studies typically require prior approval by an institutional research or ethics committee that has been established to protect the welfare of human or animal participants.

Data collection for the purposes of providing clinical services or conducting an internal program evaluation generally does not require approval by an institutional research committee. However, analysis and presentation of such data outside the program setting may qualify as research (which is defined as an effort to produce generalizable knowledge) and thus may require approval by an institutional committee. Those who submit manuscripts to the *Journal of Traumatic Stress* based on data from these sources are encouraged to consult with a representative of the applicable institutional committee to determine whether approval is needed. Presentations that report on a particular person (e.g., a clinical case) also usually require written permission from that person to allow public disclosure for educational purposes, and involve alteration or withholding of information that might directly or indirectly reveal identity and breach confidentiality.

To document how these guidelines have been followed, authors are asked to identify in the online submission process the name of the authorized institution, committee, body, entity, or agency that reviewed and approved the research or that deemed it to be exempt from ethical or Internal Review Board review. Although blinded at the time of submission, the name of the IRB or ethics committee that approved the research, and the manner in which consent was obtained, also should appear in the Procedure subsection of the Method in the body of the report.

10. **Randomized Clinical Trials:** Reports of randomized clinical trials should include a flow diagram and a completed CONSORT checklist (available at http://www.consort-statement.org) indicating how the manuscript follows CONSORT Guidelines for the reporting of randomized clinical trials. The flow diagram should be included as a figure in the manuscript whereas the checklist should be designated as a "Supplementary file not for review" during the online submission process. Please visit http://consort-statement.org for information about the consort standards and to download necessary forms.

11. **Systematic Reviews:** Reports of systematic reviews follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (http://www.prismastatement.org/documents/PRISMA%202009%20checklist.pdf) and should be accompanied by a flow diagram (http://www.prisma-statement.org/PRISMAStatement/FlowDiagram.aspx) mapping out the number of records identified, included, and excluded, and the reasons for exclusions.

12. **Writing for an International Readership:** As an international journal, the *Journal of Traumatic Stress* avoids the use of operational code names or nicknames to describe military actions, wars, or conflicts, given that these may not be equally familiar or meaningful to readers from other nations. Helpful guides for clear and neutral language for reporting on military-based research can be found at the following webpages: the ISTSS newsletter *StressPoints* (http://www.istss.org/educationresearch/traumatic-stresspoints/2015-march-(1)/media-matters-what%E2%80%99s-in-a-nameusing-military-code.aspx), the *International Press Institute* (http://ethicaljournalismnetwork.org/assets/docs/197/150/4d96ac5-55a3396.pdf) and the *Associated Press Stylebook and Briefing on Media Law* (http://www.apstylebook.com/?do=help&q=48/). In addition, authors are encouraged to give consideration to whether particular research findings might be culturally-specific rather than

universally established; e.g., prevalence rates derived from samples consisting of all-US participants should be identified as such.

13. **Originality and Uniqueness of Submissions.** Submission is a representation that neither the manuscript nor substantive content within in it has been published previously nor is currently under consideration for publication elsewhere. A statement transferring copyright from the authors (or their employers, if they hold the copyright) to the International Society for Traumatic Stress Studies will be required after the manuscript has been accepted for publication. Authors will be prompted to complete the appropriate Copyright Transfer Agreement through their Author Services account. Such a written transfer of copyright is necessary under U.S. Copyright Law in order for the publisher to carry through the dissemination of research results and reviews as widely and effectively as possible.

14. **Pre-Submission English-Language Editing:** Authors for whom English is a second language may choose to have their manuscript professionally edited before submission to improve the English. Japanese authors can find a list of local English improvement services at http://www.wiley.co.jp/journals/editcontribute.html. All services are paid for and arranged by the author, and use of one of these services does not guarantee acceptance or preference for publication.

15. **Page Charges:** The journal makes no page charges. The only exception to this, as noted above, is if authors wish tables or figures to be printed in color.

16. **Author Services:** Online production tracking is available for your article through Wiley-Blackwell's Author Services. Author Services enables authors to track their article—once it has been accepted—through the production process to publication online and in print. Authors can check the status of their articles online and choose to receive automated emails at key stages of production. Authors will receive an email with a unique link that enables them to register and have their article automatically added to the system. Please ensure that a complete email address is provided when submitting the manuscript. Visit http://authorservices.wiley.com/ for more details on online production tracking and for a wealth of resources including FAQs and tips on article preparation, submission, and more. Corresponding authors: In lieu of a complimentary copy free access to the final PDF offprint of your article will be available via Author Services only. Please therefore sign up for Author Services if you would like to access your article PDF offprint and enjoy the many other benefits the service offers. Should you wish to purchase reprints of your article, please click on the link and follow the instructions
provided: https://caesar.sheridan.com/reprints/redir.php?pub=10089&acro=JTS

17. **OnlineOpen** : The *Journal of Traumatic Stress* accepts articles for Open Access publication. Please visit http://olabout.wiley.com/WileyCDA/Section/id-828081.html for further information about OnlineOpen.

18. **NIH Public Access Mandate:** For those interested in the Wiley-Blackwell policy on the NIH Public Access Mandate, please visit our policy statement at www.wiley.com/go/nihmandate

Appendix C Search Strategy

Ovid search including PsychINFO MEDLINE and EMBASE:

Search terms	**Papers**
'ICD-11' and 'CPTSD'	8
'ICD-11' and 'Complex PTSD'	30
'ICD-11' and 'Complex post traumatic stress disorder'	3
'International Classification of Diseases' and 'CPTSD'	5
'International Classification of Diseases' and 'Complex PTSD'	28
'International Classification of Diseases' and 'Complex post traumatic stress disorder'	4
Total	**78**
After removal of duplicates	**28**

Google scholar search

Search terms	**Papers**
'ICD-11' and 'CPTSD'	43
'ICD-11' and 'Complex PTSD'	227
'ICD-11' and 'Complex post traumatic stress disorder'	72
'International Classification of Diseases' and 'CPTSD'	59

‘International Classification of Diseases’ and ‘Complex PTSD’	345
‘International Classification of Diseases’ and ‘Complex post-traumatic stress disorder’	73
Total	**819**
After titles scanned and duplicates removed	**121**

Appendix D Quality Criteria

Criteria	Yes	No	Other (CD, NR, NA, partial)
1. Was the research question or objective in this paper clearly stated?			
2. Was the study population clearly specified and defined?			
3. Was the participation rate for eligible persons at least 50%?			
4. Were all the subjects selected or recruited from the same or similar populations (including same time period?)			
Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants.			
5. Was a sample size justification, power description, or variance and effect size estimate provided?			
6. For the analysis in the paper, were the exposure(s) of interest measured prior to the outcome(s) being measured?			
7. Was the timeframe sufficient so that one could reasonably expect to see an association between exposure and outcome if it existed?			
8. For exposures that can vary in amount or level, did the study examine different levels of the exposure as related to the outcome (e.g. categories of exposure, or exposure measured as continuous variable)?			
9. Were the exposure measures (independent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?			
10. Was the exposure(s) assessed more than once over time?			

11. Were the outcome measures (dependent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?

12. Were the outcome assessors blinded to the exposure status of participants?

13. Was loss for follow-up after baseline 20% or less?

14. Were key potential confounding variables measured and adjusted statistically for their impact on the relationship between exposure and outcome(s)?

15. Was the statistical method appropriate to answer the research question?

16. Were a range of models explored? And the most appropriate one chosen?

17. Was a measure of BPD included and the differences between CPTSD and BPD explored?

18. Does the sample have clear definitions of type I and II trauma?

Quality Rating (Good, Fair or Poor) (see guidance)

Rater 1 initials:

Rater 2 initials:

Additional Comments (If POOR, please state why):

*CD, cannot determine; NA, not applicable; NR, not reported

Guidance for Assessing the Quality of Observational Cohort and Cross-Sectional Studies

The guidance document below is organized by question number from the tool for quality assessment of observational cohort and cross-sectional studies.

Question 1. Research question

Did the authors describe their goal in conducting this research? Is it easy to understand what they were looking to find? This issue is important for any scientific paper of any type. Higher quality scientific research explicitly defines a research question.

Questions 2 and 3. Study population

Did the authors describe the group of people from which the study participants were selected or recruited, using demographics, location, and time period? If you were to conduct this study again, would you know who to recruit, from where, and from what time period? Is the cohort population free of the outcomes of interest at the time they were recruited?

An example would be men over 40 years old with type 2 diabetes who began seeking medical care at Phoenix Good Samaritan Hospital between January 1, 1990 and December 31, 1994. In this example, the population is clearly described as: (1) who (men over 40 years old with type 2 diabetes); (2) where (Phoenix Good Samaritan Hospital); and (3) when (between January 1, 1990 and December 31, 1994). Another example is women ages 34 to 59 years of age in 1980 who were in the nursing profession and had no known coronary disease, stroke, cancer, hypercholesterolemia, or diabetes, and were recruited from the 11 most populous States, with contact information obtained from State nursing boards.

In cohort studies, it is crucial that the population at baseline is free of the outcome of interest. For example, the nurses' population above would be an appropriate group in which to study incident coronary disease. This information is usually found either in descriptions of population recruitment, definitions of variables, or inclusion/exclusion criteria.

You may need to look at prior papers on methods in order to make the assessment for this question. Those papers are usually in the reference list.

If fewer than 50% of eligible persons participated in the study, then there is concern that the study population does not adequately represent the target population. This increases the risk of bias.

Question 4. Groups recruited from the same population and uniform eligibility criteria

Were the inclusion and exclusion criteria developed prior to recruitment or selection of the study population? Were the same underlying criteria used for all of the subjects involved? This issue is related to the description of the study population, above, and you may find the information for both of these questions in the same section of the paper.

Most cohort studies begin with the selection of the cohort; participants in this cohort are then measured or evaluated to determine their exposure status. However, some cohort studies may recruit or select exposed participants in a different time or place than unexposed participants, especially retrospective cohort studies–which is when data are obtained from the past (retrospectively), but the analysis examines exposures prior to outcomes. For example, one research question could be whether diabetic men with clinical depression are at higher risk for cardiovascular disease than those without clinical depression. So, diabetic men with depression might be selected from a mental health clinic, while diabetic men without depression might be selected from an internal medicine or endocrinology clinic. This study recruits groups from different clinic populations, so this example would get a "no."

However, the women nurses described in the question above were selected based on the same inclusion/exclusion criteria, so that example would get a "yes."

Question 5. Sample size justification

Did the authors present their reasons for selecting or recruiting the number of people included or analyzed? Do they note or discuss the statistical power of the study? This question is about whether or not the study had enough participants to detect an association if one truly existed.

A paragraph in the methods section of the article may explain the sample size needed to detect a hypothesized difference in outcomes. You may also find a discussion of power in the discussion section (such as the study had 85 percent power to detect a 20 percent increase in the rate of an outcome of interest, with a 2-sided alpha of 0.05). Sometimes estimates of variance and/or estimates of effect size are given, instead of sample size calculations. In any of these cases, the answer would be "yes."

However, observational cohort studies often do not report anything about power or sample sizes because the analyses are exploratory in nature. In this case, the answer would be "no." This is not a "fatal flaw." It just may indicate that attention was not paid to whether the study was sufficiently sized to answer a prespecified question–i.e., it may have been an exploratory, hypothesis-generating study.

Question 6. Exposure assessed prior to outcome measurement

This question is important because, in order to determine whether an exposure causes an outcome, the exposure must come before the outcome.

For some prospective cohort studies, the investigator enrolls the cohort and then determines the exposure status of various members of the cohort (large epidemiological studies like Framingham used this approach). However, for other cohort studies, the cohort is selected based on its exposure status, as in the example above of depressed diabetic men (the exposure being depression). Other examples include a cohort identified by its exposure to fluoridated drinking water and then compared to a cohort living in an area without fluoridated water, or a cohort of military personnel exposed to combat in the Gulf War compared to a cohort of military personnel not deployed in a combat zone.

With either of these types of cohort studies, the cohort is followed forward in time (i.e., prospectively) to assess the outcomes that occurred in the exposed members compared to nonexposed members of the cohort. Therefore, you begin the study in the present by looking at groups that were exposed (or not) to some biological or behavioral factor, intervention, etc., and then you follow them forward in time to examine outcomes. If a cohort study is conducted properly, the answer to this question should be "yes," since the exposure status of members of the cohort was determined at the beginning of the study before the outcomes occurred.

For retrospective cohort studies, the same principal applies. The difference is that, rather than identifying a cohort in the present and following them forward in time, the investigators go back in time (i.e., retrospectively) and select a cohort based on their exposure status in the past and then follow them forward to assess the outcomes that occurred in the exposed and nonexposed cohort members. Because in retrospective cohort studies the exposure and outcomes may have already occurred (it depends on how long they follow the cohort), it is important to make sure that the exposure preceded the outcome.

Sometimes cross-sectional studies are conducted (or cross-sectional analyses of cohort-study data), where the exposures and outcomes are measured during the same timeframe. As a result, cross-sectional analyses provide weaker evidence than regular cohort studies regarding a potential causal relationship between exposures and outcomes. For cross-sectional analyses, the answer to Question 6 should be "no."

Question 7. Sufficient timeframe to see an effect

Did the study allow enough time for a sufficient number of outcomes to occur or be observed, or enough time for an exposure to have a biological effect on an outcome? In the examples given above, if clinical depression has a biological effect on increasing risk for CVD, such an effect may take years. In the other example, if higher dietary sodium increases BP, a short timeframe may be sufficient to assess its association with BP, but a longer timeframe would be needed to examine its association with heart attacks.

The issue of timeframe is important to enable meaningful analysis of the relationships between exposures and outcomes to be conducted. This often requires at least several years, especially when looking at health outcomes, but it depends on the research question and outcomes being examined.

Cross-sectional analyses allow no time to see an effect, since the exposures and outcomes are assessed at the same time, so those would get a "no" response.

Question 8. Different levels of the exposure of interest

If the exposure can be defined as a range (examples: drug dosage, amount of physical activity, amount of sodium consumed), were multiple categories of that exposure assessed? (for example, for drugs: not on the medication, on a low dose, medium dose, high dose; for dietary sodium, higher than average U.S. consumption, lower than recommended consumption, between the two). Sometimes discrete categories of exposure are not used, but instead exposures are measured as continuous variables (for example, mg/day of dietary sodium or BP values).

In any case, studying different levels of exposure (where possible) enables investigators to assess trends or dose-response relationships between exposures and outcomes–e.g., the higher the exposure, the greater the rate of the health outcome. The presence of trends or dose-response relationships lends credibility to the hypothesis of causality between exposure and outcome.

For some exposures, however, this question may not be applicable (e.g., the exposure may be a dichotomous variable like living in a rural setting versus an urban setting, or vaccinated/not vaccinated with a one-time vaccine). If there are only two possible exposures (yes/no), then this question should be given an "NA," and it should not count negatively towards the quality rating.

Question 9. Exposure measures and assessment

Were the exposure measures defined in detail? Were the tools or methods used to measure exposure accurate and reliable–for example, have they been validated or are they objective? This issue is important as it influences confidence in the reported exposures. When exposures are measured with less accuracy or validity, it is harder to see an association between exposure and outcome even if one exists. Also as important is whether the exposures were assessed in the same manner within groups and between groups; if not, bias may result.

For example, retrospective self-report of dietary salt intake is not as valid and reliable as prospectively using a standardized dietary log plus testing participants' urine for sodium content. Another example is measurement of BP, where there may be quite a difference between usual care, where clinicians measure BP however it is done in their practice setting (which can vary considerably), and use of trained BP assessors using standardized equipment (e.g., the same BP device which has been tested and calibrated) and a standardized protocol (e.g., patient is seated for 5 minutes with feet flat on the floor, BP is taken twice in each arm, and all four measurements are averaged). In each of these cases, the former would get a "no" and the latter a "yes."

Here is a final example that illustrates the point about why it is important to assess exposures consistently across all groups: If people with higher BP (exposed cohort) are seen by their providers more frequently than those without elevated BP (nonexposed group), it also increases the chances of detecting and documenting changes in health outcomes, including CVD-related events. Therefore, it may lead to the conclusion that higher BP leads to more CVD events. This may be true, but it could also be due to the fact that the subjects with higher BP were seen more often; thus, more CVD-related events were detected and documented simply because they had more encounters with the health care system. Thus, it could bias the results and lead to an erroneous conclusion.

Question 10. Repeated exposure assessment

Was the exposure for each person measured more than once during the course of the study period? Multiple measurements with the same result increase our confidence that the exposure status was correctly classified. Also, multiple measurements enable investigators to look at changes in exposure over time, for example, people who ate high dietary sodium throughout the followup period, compared to those who started out high then reduced their intake, compared to those who ate low sodium throughout. Once again, this may not be applicable in all cases. In many older studies, exposure was measured only at baseline. However, multiple exposure measurements do result in a stronger study design.

Question 11. Outcome measures

Were the outcomes defined in detail? Were the tools or methods for measuring outcomes accurate and reliable–for example, have they been validated or are they objective? This issue is important because it influences confidence in the validity of study results. Also important is whether the outcomes were assessed in the same manner within groups and between groups.

An example of an outcome measure that is objective, accurate, and reliable is death–the outcome measured with more accuracy than any other. But even with a measure as objective as death, there can be differences in the accuracy and reliability of how death was assessed by the investigators. Did they base it on an autopsy report, death certificate, death registry, or report from a family member? Another example is a study of whether dietary fat intake is related to blood cholesterol level (cholesterol level being the outcome), and the cholesterol level is measured from fasting blood samples that are all sent to the same laboratory. These examples would get a "yes." An example of a "no" would be self-report by subjects that they had a heart attack, or self-report of how much they weigh (if body weight is the outcome of interest).

Similar to the example in Question 9, results may be biased if one group (e.g., people with high BP) is seen more frequently than another group (people with normal BP) because more frequent encounters with the health care system increases the chances of outcomes being detected and documented.

Question 12. Blinding of outcome assessors

Blinding means that outcome assessors did not know whether the participant was exposed or unexposed. It is also sometimes called "masking." The objective is to look for evidence in the article that the person(s) assessing the outcome(s) for the study (for example, examining medical records to determine the outcomes that occurred in the exposed and comparison groups) is masked to the exposure status of the participant. Sometimes the person measuring the exposure is the same person conducting the outcome assessment. In this case, the outcome assessor would most likely not be blinded to exposure status because they also took measurements of exposures. If so, make a note of that in the comments section.

As you assess this criterion, think about whether it is likely that the person(s) doing the outcome assessment would know (or be able to figure out) the exposure status of the study participants. If the answer is no, then blinding is adequate. An example of adequate blinding of the outcome assessors is to create a separate committee, whose members were not involved in the care of the patient and had no information about the study participants' exposure status. The committee would then be provided

with copies of participants' medical records, which had been stripped of any potential exposure information or personally identifiable information. The committee would then review the records for prespecified outcomes according to the study protocol. If blinding was not possible, which is sometimes the case, mark "NA" and explain the potential for bias.

Question 13. Followup rate

Higher overall followup rates are always better than lower followup rates, even though higher rates are expected in shorter studies, whereas lower overall followup rates are often seen in studies of longer duration. Usually, an acceptable overall followup rate is considered 80 percent or more of participants whose exposures were measured at baseline. However, this is just a general guideline. For example, a 6-month cohort study examining the relationship between dietary sodium intake and BP level may have over 90 percent followup, but a 20-year cohort study examining effects of sodium intake on stroke may have only a 65 percent followup rate.

Question 14. Statistical analyses

Were key potential confounding variables measured and adjusted for, such as by statistical adjustment for baseline differences? Logistic regression or other regression methods are often used to account for the influence of variables not of interest.

This is a key issue in cohort studies, because statistical analyses need to control for potential confounders, in contrast to an RCT, where the randomization process controls for potential confounders. All key factors that may be associated both with the exposure of interest and the outcome–that are not of interest to the research question–should be controlled for in the analyses.

For example, in a study of the relationship between cardiorespiratory fitness and CVD events (heart attacks and strokes), the study should control for age, BP, blood cholesterol, and body weight, because all of these factors are associated both with low fitness and with CVD events. Well-done cohort studies control for multiple potential confounders.

Question 15. Choice of analysis

Was the most appropriate method of analysis used given the sample size and research question?

Question 16. Factor model

Do the researchers investigate the fit of a number of factor models, and is the one chosen clearly the best fit to the data?

It may be that the model chosen is the best fit, but is not significantly better than other factor models, in which case record partial.

Question 17. BPD measure

Due to the controversy around the difference between BPD and complex trauma, it is important that the study included a measure of BPD, and investigates whether CPTSD and BPD are distinct. If the study did not, answer 'no'.

Question 18. Choice of analysis

Do the participants clearly fall into two groups? One with type I traumatic experiences, and the other with type II traumatic experiences? Do many participants identify as having both type I and type II traumatic experiences, if so answer 'no'. If the paper has made attempts to define people as type I and type II, but this is flawed, for example because of an large overlap in individuals with type I and type II trauma; or very small number in one group – record partial.

Some general guidance for determining the overall quality rating of observational cohort and cross-sectional studies

The questions on the form are designed to help you focus on the key concepts for evaluating the internal validity of a study. They are not intended to create a list that you simply tally up to arrive at a summary judgment of quality.

Internal validity for cohort studies is the extent to which the results reported in the study can truly be attributed to the exposure being evaluated and not to flaws in the design or conduct of the study–in other words, the ability of the study to draw associative conclusions about the effects of the exposures being studied on outcomes. Any such flaws can increase the risk of bias.

Critical appraisal involves considering the risk of potential for selection bias, information bias, measurement bias, or confounding (the mixture of exposures that one cannot tease out from each other). Examples of confounding include co-interventions, differences at baseline in patient characteristics, and other issues throughout the questions above. High risk of bias translates to a rating of poor quality. Low risk of bias translates to a rating of good quality. (Thus, the greater the risk of bias, the lower the quality rating of the study.)

In addition, the more attention in the study design to issues that can help determine whether there is a causal relationship between the exposure and outcome, the higher quality the study. These include exposures occurring prior to outcomes, evaluation of a dose-response gradient, accuracy of measurement of both exposure and outcome, sufficient timeframe to see an effect, and appropriate control for confounding–all concepts reflected in the tool.

Generally, when you evaluate a study, you will not see a "fatal flaw," but you will find some risk of bias. By focusing on the concepts underlying the questions in the quality assessment tool, you should ask yourself about the potential for bias in the study you are critically appraising. For any box where you check "no" you should ask, "What is the potential risk of bias resulting from this flaw in study design or execution?" That is, does this factor cause you to doubt the results that are reported in the study or doubt the ability of the study to accurately assess an association between exposure and outcome?

The best approach is to think about the questions in the tool and how each one tells you something about the potential for bias in a study. The more you familiarize yourself with the key concepts, the more comfortable you will be with critical appraisal. Examples of studies rated good, fair, and poor are useful, but each study must be assessed on its own based on the details that are reported and consideration of the concepts for minimizing bias.

Appendix E Types of statistical analysis used in the studies

Papers used a range of statistical analytic techniques. The most common analyses were confirmatory factor analysis (CFA; Cloitre et al., 2013; Hyland et al., 2016; Karatzias et al., 2016; Knefel & Lueger-Schuster, 2013; Tay et al., 2015), latent class analysis (LCA; Cloitre et al., Elklit at al., 2014; 2014 Feiszli, 2015; Karatzias et al., 2017; Murphy et al., 2016; Perkonigg et al., 2015; Sacher et al., 2016) and latent profile analysis (LPA, Cloitre et al., 2013; Feiszli, 2015; Knefel et al., 2014). Wolf et al., (2015) used factor mixed modelling (FMM).

CFA is used to investigate whether a hypothesised structure is appropriate for describing multivariate data (Fox, 1983). CFA tests whether underlying latent factors explain variance in the data set. Both LPA and LCA are designed to identify discrete, non-overlapping latent groups of individuals, based on their responses to a number of items (Tein, Coxe, & Cham, 2013). LPA is used for continuous variables, and LCA for categorical variables (Oberski, 2016). FMM is a form of class analysis which allows the testing of both categorical, continuous and hybrid models (Nylund et al., 2007).

In CFA, LCA, LPA and FMM a range of models are tested, with different numbers of classes. A range of fit statistics can then be used in order to determine the model which best fits the data. Chi-square is frequently used to measure model fit, with good model fit indicated by a non-significant result. However, chi-square is sensitive to sample size. It will generally indicate poor model fit if the sample size is large, and can be under powered if the sample is small (Hooper et al., 2008). A range of other fit statistics have been developed, many of which are based on chi-square, details of the most commonly used can be found in Appendix E.1. However, this is a complex area and there is still a degree of subjectivity in choosing the most appropriate model, particularly as at times fit statistics give differing indications. Nylund et al. (2007) compared the performance of commonly used fit tests and indices. They found that the BIC performed the best of the information criterion tests, and that the BLRT was a consistently strong predictor of model fit, they recommend prioritising these tests.

Appendix E.1 Common fit statistics and their interpretation

Test	Interpretation
Bayesian Information Criterion (BIC; Schwartz, 1978)	Lower values indicate a better model fit.
Sample size adjusted BIC (ssaBIC; Sclove, 1987)	Lower values indicate a better model fit.
Akaike's Information Criterion (AIC; Akaike, 1987)	Lower values indicate a better model fit.
Bootstrapped likelihood ratio test (BLRT; McLachlan & Peel, 2000).	A significant *p* value indicates that the specified number of classes is preferred over a model with one less class
Lo-Mendell-Rubin-adjusted likelihood ratio test (LMRA; Lo, Mendell & Rubin, 2001)	A significant *p* value indicates that the specified number of classes is preferred over a model with one less class
Root mean-square error of approximation (RMSEA)	Smaller scores are indicative of better fit. Excellent < 0.06, good < 0.08, acceptable < .10. (Hu & Bentler, 1999; Kline, 2004).
Comparative fit index (CFI)	Higher value indicates a better fit. Excellent > .95, good > .90
Tucker-Lewis Index (TLI)	Higher value indicates a better fit. Excellent > .95, good > .90

Appendix F – Fit indices for the individual studies

Appendix F.1 Knefel et al. (2014) Latent class models and fit indices

Model	Log-likelihood	BIC	Entropy	LMR-A *p*-value	BLRT *p*-value
2-factor	-4293.39	8793.25	0.93	<0.001	<0.0001
3- factor	- 4199.20	8680.95	0.88	0.0135	<0.0001
4- factor	- 4151.24	8661.11	0.90	0.5351	<0.0001
5-factor	- 4116.59	8667.86	0.90	0.7018	<0.0001
6- factor	- 4085.22	8681.21	0.91	0.4714	<0.0001[a]

Note BIC, Bayesian Information Criterion; LMR-A, Lo-Mendell-Rubin adjusted likelihood ratio test; BLRT, bootstrap likelihood ratio test. Best model highlighted

Appendix F.2 Hyland et al. (2016) - Fit Indices for the Alternative Models of the Symptom Structure of CPTSD

Models	Chi-square	*df*	CFI	TLI	RMSEA [90%CI]	SRMR	BIC
1-factor	266.86*	54	.77	.72	.09 [.08, .11]	.07	14874
2-factor	209.51*	53	.83	.79	.08 [.07, .09]	.06	14816
3-factor	109.10*	39	.93	.87	.06 [.05, .07]	.04	14793
Higher order	143.79*	47	.90	.86	.07 [.06, .08]	.05	14781

df , degrees of freedom; CFI, comparative fit index; TLI, Tucker-Lewis index; RMSEA [90% CI] root mean square error of approximation with 90% confidence intervals; SRMR, standardized square root mean residual; BIC, Bayesian information criterion. Best model highlighted

*p < .001.

Appendix F.3 Karatzias et al. (2016) Fit indices

Model	Chi-square (d*f*)	RMSEA (90% CI)	CFI	TLI
1	867.10 (230)*	0.119 (0.111–0.128)	0.894	0.883
2	401.98 (215)*	0.067 (0.057–0.077)	0.969	0.963
3	452.53 (224)*	0.073 (0.063–0.082)	0.962	0.957
4	399.81 (223)*	0.064 (0.054–0.074)	0.970	0.967
5	458.63 (226)*	0.073 (0.063–0.082)	0.961	0.957
6	583.60 (224)*	0.091 (0.082−0.100)	0.940	0.932
7	629.42 (229)*	0.095 (0.086–0.104)	0.933	0.926

Note: df, degrees of freedom; CFI, Comparative Fit Index; TLI = Tucker Lewis Index; RMSEA, Root-Mean-Square Error of Approximation. Best model highlighted

* $p < .05$

Model 1 – Unidimensional CPTSD

Model 2 - Correlated 6-factor first order model of CPTSD

Model 3 – Single-factor second-order with six first order factors

Model 4 - Two-factor second order model, each measured by three first order factors

Model 5 – Two-factor second-order model, with PTSD measured by 7 items and DSO by three first-order factors

Model 6 – Two-factor second-order model, with PTSD measured by three first order factors and DSO measured by 16 items

Model 7 – Two-factor model, PTSD represented by 7 items and DSO represented by 16 items

Appendix F.4 Tay et al. (2015) Confirmatory factor analysis fit indices

Model	Chi-square (d*f*)	*p*	CFI	TLI	RMSEA
6 factor first order model	38.03 (40)	.51	.99	.99	<.01
6 factor second order model	344.39 (102)	<.001	.93	.92	<.01

Note df, degrees fof freedom; CFI, comparative fit index; TLI, Tucker Lewis fit index; RMESA, Root mean square of approximation. Best model highlighted

Appendix F5. Cloitre et al. (2013) Latent profile models and fit indices

Model	Log-likelihood	BIC	Entropy	LMR-A *p*-value	BLRT *p*-value
2 classes	-4777.98	9767.24	0.87	<0.001	<0.001
3 classes	-4673.08	9631.68	0.85	0.004	<0.001
4 classes	-4592.53	9544.81	0.86	0.267	<0.001
5 classes	-4551.79	9537.57	0.88	0.158	<0.001
6 classes	-4515.36	9538.95	0.87	0.728	<0.001[a]

Note. Note: BIC, Bayesian information criterion; LMRA-A, Lo-Mendell-Rubin adjusted likelihood ratio test; BLRT, bootstrap likelihood ratio test. Best model highlighted

[a]The best log-likelihood value was not replicated in 31 out of 50 bootstrap draws. The p-value may not be trustworthy due to local maxim

Appendix F.6 Murphy (2016) Fit indices from latent class models

Model	Loglikelihood	AIC	BIC	ssaBIC	LMR-A *p*-value	BLRT *p-value*	Entropy
1-class	-1433.02	2880.03	2906.26	2884.05	-	-	-
2-classes	-1195.30	2420.60	2476.79	2429.21	$p < 0.01$	$p < 0.01$	0.87
3-classes	-1169.81	2385.62	2471.79	2398.84	$p < 0.01$	$P < 0.01$	0.82
4-classes	-1163.31	2388.61	2504.74	2406.42	0.55	0.67	0.83
5-classes	-1157.48	2392.95	2539.05	2415.36	0.47	1.00	0.81
6-classes	-1152.72	2399.45	257.52	2426.45	0.21	1.00	0.84

Note. AIC, Akaike information criterion,: BIC, Bayesian information criterion: ssaBIC, sample-size adjustedBIC: LMR-A LRT, Lo-Mendell-Rubin adjusted likelihood ratio test, BLRT, Bootstrapped likelihood ratio test. Best model highlighted.

Appendix F.7 Elklit et al. (2014) Fit statistics for LCA of CPTD symptoms: bereaved parents sample

Model	Loglikelihood	AIC	BIC	ssaBIC	LMRA-LRT	BLRT
1-class	-2645.09	5314.18	5367.02	5328.92		
2-classes	-2282.24	4614.48	4724.57	4645.20	717.08**	725.70**
3- classes	-2218.99	4513.98	4681.32	4560.68	1245.10**	126.50**
4-classes	-2192.38	4486.76	4711.34	4549.43	52.60	53.23**
5- classes	-2175.76	4479.52	4761.35	4558.17	32.84*	33.24
6- classes	-2162.44	4478.87	4817.95	4573.49	26.33	26.64

Note: Statistical significance: **p<.0005, *p<.05. AIC, Akaike information criterion; BIC, Bayesian information criterion; ssaBIC, sample-size-adjusted BIC; LMRA-LRT. Lo-Mendell-Rubin adjusted likelihood ratio test. Best model highlighted.

Appendix F.8 Elklit et al. (2014) Fit statistics for LCA of CPTD symptoms: sexual trauma sample

Model	Loglikelihood	AIC	BIC	ssaBIC	LMRA-LRT	BLRT
1-class	-3381.80	6787.61	6836.89	6798.81		
2-classes	-2888.37	5826.75	5929.42	5850.08	974.58**	986.86**
3- classes	-2819.85	5715.70	5871.77	5751.17	135.34**	137.05**
4-classes	-2802.25	5706.49	5915.95	5754.10	34.77	35.210*
5- classes	-2787.34	5702.67	5965.52	5762.41	29.45	29.82
6- classes	-2773.17	5700.33	6016.57	5772.20	27.99	28.34

Note: Statistical significance: **p<.0005, *p<.05. AIC, Akaike information criterion; BIC, Bayesian information criterion; ssaBIC, sample-size-adjusted BIC; LMRA-LRT. Lo-Mendell-Rubin adjusted likelihood ratio test. Best model highlighted.

Appendix F9 Elklit et al. (2014) Fit statistics for LCA of CPTD symptoms: physical trauma sample

Model	Loglikelihood	AIC	BIC	ssaBIC	LMRA-LRT	BLRT
1-class	-1331.47	2686.95	2727.34	2689.31		
2-classes	-1081.29	2212.57	2296.72	2217.50	493.30**	500.37**
3- classes	-1044.63	2165.26	2293.16	2172.75	72.28	73.32**
4-classes	-1026.86	2155.73	2327.39	2165.79	35.03	35.53**
5- classes	-1013.74	2155.48	2370.91	2168.11	25.87	26.24
6- classes	-999.60	2153.19	2412.37	2168.38	27.65	28.05

Note: Statistical significance: **p<.0005, *p<.05. AIC, Akaike information criterion; BIC, Bayesian information criterion; ssaBIC, sample-size-adjusted BIC; LMRA-LRT. Lo-Mendell-Rubin adjusted likelihood ratio test. Best model highlighted.

Appendix F.10 Karatzias (2017) Fit Statistics for Diagnostic Variables from ICD-11 CPTSD Scale

Model	Log-likelihood	AIC	BIC	ssaBIC	LMR-LRT *p*-value
One-class	−443.47	898.94	918.51	899.51	
Two-classes	−374.81	775.61	818.03	776.85	<.010
Three-classes	−364.01	768.02	833.27	769.92	.10
Four-classes	−359.18	772.36	860.45	774.92	.02
Five-classes	−356.95	781.90	892.83	785.13	.03
Six-classes	−355.07	792.15	925.92	796.04	.08

Note. AIC, Akaike information criterion; BIC, Bayesian information criterion; ssaBIC, sample-size-adjusted BIC; LMRA-LRT. Lo-Mendell-Rubin adjusted likelihood ratio test. Best model highlighted

Appendix F.11 Sachser et al. (2016) Latent class models and fit indices

Model	Log-likelihood	No. of parameters	AIC	BIC	Entropy	LMR-LMT *p*-value	BLRT p-value
One-class	-1239.01	12	2502.00	2538.52	-	-	-
Two-classes	-1164.91	25	2379.82	2455.90	0.77	<.001	<.001
Three-classes	-1151.82	38	2379.64	2495.29	0.79	.77	.77
Four-classes	-1140.58	51	2388.17	2538.38	0.85	.18	.18

Note. AIC, Akaike information criterion; BIC, Bayesian information criterion; LMRA-LRT, Lo-Mendell-Rubin-adjusted likelihood ratio test,BLRT, bootstrap likelihood ratio test. Best model highlighted

Appendix F.12 Knefel et al (2014) Latent class models and fit indices

Model	Log-likelihood	BIC	Entropy	LMR-A *p*-value	BLRT *p*-value
Two-classes	-4293.386	8793.253	0.932	<0.001	<0.0001
Three-classes	- 4199.198	8680.950	0.884	0.0135	<0.0001
Four-classes	- 4151.242	8661.110	0.901	0.5351	<0.0001
Five-classes	- 4116.582	8667.863	0.897	0.7018	<0.0001
Six-classes	- 4085.218	8681.207	0.908	0.4714	<0.0001[a]

[a]The best log-likelihood value was not replicated in 30 out of 50 bootstrap draws. The p-value may not be trustworthy due to local maxima.

Note. BIC, Bayesian Information Criterion; LMR-A, Lo-Mendell-Rubin adjusted likelihood ratio test; BLRT, bootstrap likelihood ratio test. Best model highlighted

Appendix F.13 Perkonigg (2015) Model fit parameters from latent class analyses

Model	AIC	BIC	ssaBIC	LMR-A *p*-value
Two-classes	5534.6	5598.0	5556.8	$p < 0.001$
Three-classes	5407.7	5505.2	5441.7	$p < 0.001$
Four-classes	5342.0	5473.7	5388.0	$p < 0.001$
Five-classes	5346.9	5512.7	5404.7	$p = .18$

Note. Akaike information criterion; BIC, Bayesian information criterion; ssaBIC, sample-size-adjusted BIC; LMRA-LRT. Lo-Mendell-Rubin adjusted likelihood ratio test. Best model highlighted

Appendix F.14 Cloitre et al. (2014) Latent class models and fit indices

Model	Log-likelihood	BIC	SSA-BIC	AIC	Entropy	LMR-A *p*-value	BLRT *p*-value
2 classes	-3523.01	7288.32	7151.965	7132.020	0.78	0.029	<0.001
3 classes	-3433.02	7232.310	7026.199	6996.048	0.817	0.066	<0.001
4 classes	-3382.03	7254.278	6978.406	6938.051	0.808	0.401	<0.001
5 classes	-3338.21	7290.613	6944.981	6894.421	0.848	0.639	<0.001[a]

[a]The best log-likelihood value was not replicated in 32 out of 50 bootstrap draws. The p-value may not be trustworthy due to local maxim

Note. Note: BIC, Bayesian information criterion; ssaBIC, sample-size-adjusted BIC, LMRA-A, Lo-Mendell-Rubin adjusted likelihood ratio test; BLRT, bootstrap likelihood ratio test. Best model highlighted

Appendix F.15 Feiszli (2015) Fit indices of LPA

Model	No. free parameters	Log likelihood	BIC	SSA-BIC	BLRT *p*-value	LMR-A *p*-value	Entropy
1 class	22	-19047.95	38240.56	38170.70	NA	NA	NA
2 classes	34	-17761.62	35746.79	35638.84	0.0000	0.0016	0.96
3 classes	46	-17327.66	34957.71	34811.65	0.0000	0.0008	0.97
4 classes	58	-17114.29	34609.93	34425.76	0.0000	0.4611	0.96
5 classes	70	-16933.10	34326.46	34104.19	0.0000	0.1504	0.91
6 classes	82	-16742.12	34023.40	33763.02	0.0000	0.06	0.92

Note. Note: BIC, Bayesian information criterion; ssaBIC, sample-size-adjusted BIC; LMRA-A, Lo-Mendell-Rubin adjusted likelihood ratio test; BLRT, bootstrap likelihood ratio test. Best model highlighted

Appendix F16 Wolf (2015) Fit of Structural Models Evaluated in the Community Sample

Model	BIC	Entropy	LMR-A *p*-value	BLRT *p*-value	Chi-square (d*f*)	RMSEA	SRMR	CFI	TLI
CFA: 1 factor	6009				88.66(9)	.16	.07	.84	.73
CFA: 2 factor	5926				25.43(8)	.08	.05	.96	.93
LPA: 2 classes	6023	.94	.002	<.001					
LPA: 3 classes	5835	.93	.02	<.001					
LPA: 4 classes	5679	.95	.03	<.001					
LPA: 5 classes	5566	.95	.29	<.001					
FMM: 2 classes, 1 factor	6024	.94	.002	<.001					
FMM: 2 classes, 2 factors	5793	.93	.48	<.001					
FMM: 3 classes, 1 factor	5804	.98	.002	<.001					
FMM: 3 classes, 2 factors	5717	.94	.45	<.001					
FMM: 4 classes, 1 factor	5644	.99	.05	<.001					
FMM: 4 classes, 2 factors	5481	.99	.05	<.001					

Note. BIC = Bayesian information criterion; BLRT = bootstrapped likelihood ratio test; CFA = confirmatory factor analysis; CFI = comparative fit index; FMM, factor mixture model; LMRA, Lo-Mendell-Rubin–adjusted likelihood ratio test; LPA, latent profile analysis; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; TLI, Tucker-Lewis index. Best model highlighted

Appendix F.17 Wolf (2015) Fit of Structural Models Evaluated in the Veterans Sample

Model	BIC	Entropy	LMR-A *p*-value	BLRT *p*-value	Chi-square (d*f*)	RMSEA	SRMR	CFI	TLI
CFA: 1 factor	4939				65.66	.14	.06	.90	.84
CFA: 2 factor	4888				19.80	.07	.03	.98	.96
LPA: 2 classes	4954	.93	.007						
LPA: 3 classes	4756	.90	.20						
LPA: 4 classes	4679	.92	.03						
LPA: 5 classes	4579	.91	.43						
FMM: 2 classes, 1 factor	4954	.93	.007						
FMM: 2 classes, 2 factors	4757	.90	.17						
FMM: 3 classes, 1 factor	4863	.85	.32						
FMM: 3 classes, 2 factors	4677	.89	.13						
FMM: 4 classes, 1 factor	4699	.89	.006						
FMM: 4 classes, 2 factors	4531	.88	.03						

Note. BIC = Bayesian information criterion; BLRT = bootstrapped likelihood ratio test; CFA = confirmatory factor analysis; CFI = comparative fit index; FMM, factor mixture model; LMRA, Lo-Mendell-Rubin–adjusted likelihood ratio test; LPA, latent profile analysis; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; TLI, Tucker-Lewis index. Best model highlighted

Appendix G Ethical Approval

WoSRES

West of Scotland Research Ethics Service

NHS Greater Glasgow and Clyde

Mr Richard Browne

Trainee Clinical Psychologist

NHS Lothian

Psychology Department, 2nd Floor,

MacKinnon House, Royal Edinburgh Hospital,

Morningside Place

EH10 5HF

West of Scotland REC 4

West Ambulatory Care Hospital

Dalnair Street

Yorkhill

Glasgow

www.nhsggc.org.uk

Date 25 April 2016

Direct line

0141-232-1807 e-mail

Wosrec4@ggc.scot.nhs.uk

Dear Mr Browne

Study title:	**Symptom profiles of men and women in forensic services who have experienced trauma (evidence for proposed ICD11 PTSD and complex PTSD)**
REC reference:	**15/WS/0213**
Amendment number:	**Amendment 1.2 12.04.16 (REC Ref AM01/2)**

Amendment date: **12 April 2016**

IRAS project ID: **185343**

Summary of Amendment;

This Modified amendment refers to;

1. HMP Cornton Vale removed as a study site.
2. Dr Elizabeth Flynn added as field supervisor.
3. An initial pilot phase of the study will be conducted at HMP Glenochil and will aim to recruit 20 participants. If successful will then attempt to recruit a further 60 participants.
4. Number of participants reduced from 160 to 80.
5. Recruitment strategy altered to reduce work of prison staff - PIS, covering letter and return form will be delivered to all prisoners at HMP Glenochil through the internal mail service and they can reply using the internal mail service. At meeting they will have the opportunity to ask questions, be provided with additional information and inclusion/exclusion criteria will be confirmed and written consent taken.
6. Follow-up support system changed as prison staff were concerned that prisoners may participate in the study in order to gain faster access to support services.

Thank you for submitting the above amendment, which was received on 12 April 2016. It is noted that this is a modification of an amendment previously rejected by the Committee (our letter of 11 March 2016 refers).

The modified amendment was reviewed by the Sub-Committee in correspondence. A list of the members who took part in the review is attached.

Ethical opinion

I am pleased to confirm that the Committee has given a favourable ethical opinion of the modified amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved are:

Document	*Version*	*Date*
Covering letter on headed paper		

Covering letter on headed paper [Response to Ethics]		22 April 2016
Notice of Modified Amendment	Amendment 1.2 12.04.16 (REC Ref AM01/2)	12 April 2016
Other [No Participation Letter]	1	22 April 2016

R&D approval

All investigators and research collaborators in the NHS should notify the R&D office for the relevant NHS care organisation of this amendment and check whether it affects R&D approval of the research.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

We are pleased to welcome researchers and R & D staff at our NRES committee members' training days – see details at http://www.hra.nhs.uk/hra-training/

15/WS/0213:	**Please quote this number on all correspondence**

Yours sincerely

On Behalf

Dr Brian Neilly

Chair

Enclosures: *List of names and professions of members who took part in the review*

Copy to: *Mrs Jo-Anne Robertson, The University of Edinburgh*

West of Scotland REC 4

Attendance at Sub-Committee of the REC meeting on 30 April 2016

Committee Members:

Name	*Profession*	*Present*	*Notes*
Dr Ken James	Consultant Anaesthetist	Yes	Chair of Meeting
Dr Rachael MacIsaac	Stroke Trials Statistician	Yes	
Mr John Woods	Retired Project Coordinator	Yes	

Also in attendance:

Name	*Position (or reason for attending)*
Miss Sophie Bagnall	Assistant Coordinator

Appendix H Original study proposal for the University of Edinburgh

Introduction

1) Please provide a brief critical review of relevant literature, which should clearly demonstrate the rationale and scientific justification for the research. (Relevant to IRAS A12) (Guideline 1000 to 1500 words)

The forthcoming edition of the WHO ICD-11 has proposed two related, but distinct, diagnoses for people with trauma symptoms: post-traumatic stress disorder (PTSD) and complex post-traumatic stress disorder (CPTSD) (Maercker *et al*., 2013). The proposed diagnostic criteria for PTSD have been simplified from ICD-10, incorporating six symptoms, in three clusters: re-experiencing of the traumatic event; avoidance of traumatic reminders; and a sense of threat that is manifested in hypervigilance or increased startle reaction. Proposed diagnostic criteria for CPTSD involves the presence of the core elements of PTSD, with at least one additional symptom from each of three domains related to disturbances in self-organisation: poor affect regulation; negative self-concept and interpersonal difficulties.

The idea that CPTSD represents a distinct diagnosis was first put forward by Herman (1992). She argued that the current diagnosis of PTSD does not fit with those who have experienced prolonged, repeated trauma, noting that this can only occur when the survivor is captive and controlled by the perpetrator. She postulates that such complex traumatic events are likely to lead to more complex presentations which may include the symptoms of PTSD, but will include a range of additional difficulties as per ICD proposals.

Diagnostic Classification of PTSD and CPTSD

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; American Psychiatric Association [APA], 2013) considered including a CPTSD category. However, it was not included due to a lack of evidence, questions over its clinical utility and its distinction from borderline personality disorder (BPD) (Friedman *et al*., 2011). DSM-5 did add one new criterion related to negative self concept and affect regulation, which resemble the ICD-11 CPTSD domains. The debate continues as to the best way to conceptualise PTSD, and the effects of

prolonged traumatic events, fueled by the finding that clinicians prefer a limited number of symptoms to inform diagnosis (Reed *et al.,* 2011)

A number of studies have found evidence supporting ICD-11's conceptualisation of PTSD and CPTSD. Cloitre *et al.* (2013) performed a latent profile analysis (LPA) on 302 treatment-seeking individuals who had experienced a range of traumatic events, including prolonged interpersonal traumas, and single incident traumas (largely 9/11 exposure). Three classes of individuals were revealed: a PTSD class who presented with symptoms of PTSD and low levels of disturbance in self-organisation; a complex PTSD class, with symptoms of PTSD and additional disturbances in self-organisation; and a low symptom class, with low levels of symptoms across PTSD and CPTSD domains. A higher level of impairment was associated with chronic trauma. It was also found that prolonged trauma was more closely related to CPTSD than PTSD, and single incident trauma was more closely related to PTSD than CPTSD. However, this was not a direct relationship, 23% of individuals who identified childhood abuse as their worst trauma presented with PTSD rather than CPTSD, and 20% of those who experienced 9/11 developed CPTSD as opposed to PTSD. This is in line with Courtois (2004) who argues that diagnosis cannot be based solely on trauma history. However, this study has some limitations. Firstly it included a large number of female participants, limiting generalisability to a male population. In addition, a high proportion of the participants had experienced repeated interpersonal traumas, a significant number of whom had also experienced 9/11 exposure, making it difficult to draw conclusions about the effect of trauma history on the development of symptoms.

Adding evidence for the ICD-11 proposal, Knefel and Lueger-Schuster (2013) examined the prevalence and symptom profile of ICD-11 PTSD and CPTSD among 229 survivors of institutional abuse, using confirmatory factor analysis. They found a prevalence rate of 17% for PTSD, and 21.4% for CPTSD. The higher rate for CPTSD would be expected in a sample of survivors of institutional abuse, given the theoretical conceptualisation of CPTSD as related to protracted interpersonal trauma. It was also found that prolonged traumatic experiences increased the likelihood of meeting criteria for CPTSD.

Elklit *et al.* (2014) investigated whether the distinction between PTSD and CPTSD symptom profiles was maintained in three groups of traumatised individuals: people who had experienced a sexual assault; a physical assault; or the loss of a child. In line with Cloitre *et al*. (2013) they

found that a three class model was the best fit for each group. They also found that sexual assault was the most predictive of developing CPTSD followed by physical assault and bereavement.

However, the above studies have some limitations**.** All three used individual items from measures to assess the CPTSD domains, raising questions about their reliability and validity. In order to overcome this problem Cloitre *et al.* (in preparation for submission) have developed a measure of ICD-11 complex trauma, the reliability and validity of which is currently being evaluated. Also, all the studies have used specific samples, although often a necessity, this limits generalisability. In addition, each is based on retrospective data.

Not all studies have supported the ICD-11 diagnoses of CPTSD and PTSD. Wolf *et al.* (2014) applied ICD-11 PTSD and CPTSD criteria to two American samples: 323 trauma-exposed veterans and 345 trauma-exposed community participants. Like the studies above they found evidence of a three-class model, with groups comparable to those revealed by Cloitre *et al.* (2013). However, they found that a four-class model was a better fit, with classes differing in their degree of symptom severity, and not PTSD or CPTSD diagnosis. They also found that the neither trauma history, nor the number of traumatic events a participant experienced varied across the PTSD or CPTSD group They question the idea that CPTSD is more closely related to frequent interpersonal traumas than PTSD. Wolf *et al.* argue that CPTSD is better conceptualised as features of PTSD associated to the severity of the trauma, as opposed to a distinct presentation of traumatic-symptomatology. However, this study has some significant limitations. Firstly, they developed a measure of the disturbances in self-organisation, consisting of seven items covering the three domains. This measure has not been validated, therefore it is not possible to conclude whether the results reflect the true symptom profile of PTSD and CPTSD or are an artefact of this new measure. In addition, both samples were from the USA limiting the generalisability of the results. Finally, the participants were recruited via the internet, reducing power over the study protocol, and limiting the population to those who can access the Web.

The Controversy Between CPTSD and Borderline Personality Diagnoses

Some have questioned whether CPTSD represents a new diagnosis, and if it would be better conceptualised as PTSD with comorbid BPD (Driessen *et al.,* 2002). Proponents of this argument note the overlap in symptomology seen in the two diagnoses. Others agree that the two disorders are not distinct, however argue the term complex trauma would be more accurate, less stigmatizing and provide an etiology for the symptoms experienced in BPD (Lewis & Grenyer, 2009). A third group argue that the two disorders are distinct, despite the overlap in characteristics

and etiology. They cite evidence that although 81% to 91% of those with BPD report traumatic experiences, 95% to 19% do not (Herman & van der Kolk, 1987), and that there is a only a small to moderate effect size for the association between childhood sexual abuse and BPD (Fossati *et al,.*1999).

Cloitre *et al.* (2013) found that the symptom profiles of PTSD and CPTSD held whether they included or excluded those with a BPD diagnosis in their analysis, and that BPD co-occurred among all three classes. In addition, Cloitre *et al.* (2014) carried out an LPA with 208 women who had experienced childhood trauma. This revealed four classes, PTSD, CPTSD, BPD and low symptoms, indicating that BPD and CPTSD have separate symptom profiles. However this study involved a female only sample, therefore the relationship between PTSD, CPTSD and BPD in a male population is less clear.

Gender Differences in PTSD

Men have been shown to be more likely than women to experience every type of trauma other than sexual abuse and rape (Kessler *et al.*, 1995; Blain *et al*., 2010). However, the lifetime prevalence of PTSD is significantly higher in females than males, and this effect holds across a range of traumatic experiences (Kessler *et al*., 1995; Tonlin & Foa, 2006). The presentation of PTSD also appears to differ between men and across a number of domains including: cognitive appraisal; guilt; self-worth; impulse control; coping styles; and anger (Olff *et al*., 2007; Tonlin & Foa, 2006).

Knefel and Lueger-Schuster (2013) carried out gender-specific analyses of the prevalence of ICD-11 PTSD and CPTSD. They found no gender differences in PTSD diagnosis (in contrast to ICD-10) but a significant gender difference in the rates of CPTSD. They contend that this might reflect the fact that the understanding of the effects of childhood abuse comes largely from studies with female samples. It may be that the current conceptualisation of CPTSD excludes some male presentations. Miller and Resick (2007) found that men who had experienced complex trauma displayed more externalising symptoms, with females presenting with more internalising symptoms.

PTSD in Prison Populations

There is little research into the prevalence of PTSD in prison populations, although there is evidence for high levels of exposure to childhood trauma in this group (Timmerman and Emmelkamp; 2001). However, with regard to diagnosed PTSD Geoff *et al.* (2007) conducted a systematic review on the topic, and found only four studies. In these studies prevalence of PTSD ranged from 4% - 21.4%. The only study looking at prevalence of PTSD in a UK prison population found that 57%, of a sample of 95 females, met DSM-V PTSD criteria (Karatzias *et al*., 2015, in preparation).

The proposed study will be the first to look at symptom profiles of PTSD and CPTSD in a forensic population. It will also be the first to apply measures of PTSD and CPTSD prospectively, rather than in a secondary analysis. In addition, it will add to the limited evidence regarding the prevalence of PTSD in prison populations.

Research Questions / Objectives:

(Keep these focused and concise, with a maximum of five research questions).

2) What is the principal research question / objective? (IRAS A10)

1. Can a distinct profile of symptoms and psychological functioning consistent with Complex PTSD be identified in a forensic population?
2.

3) What are the secondary research questions / objectives if applicable? (IRAS A11)

1. What is the prevalence of PTSD and CPTSD in a forensic population
2. How do the traumatic symptom profiles of male and female forensic samples compare?
3. Are borderline PD symptoms associated with differences in profile between individuals who have experienced a single trauma compared with a complex trauma?

Methodology

4) Please give a full summary of your design and methodology. It should be clear exactly what will happen at each stage of the project. (Relevant to IRAS A13)

Main Study Design

This study will employ a cross-sectional, quantitative design. Participants will be invited to complete a set of eight questionnaires measuring a range of variables. Symptom profiles of PTSD and CPTSD will be investigated using Confirmatory Factor Analysis (CFA). The groups revealed by the CFA will be compared on measures of emotional regulation, interpersonal problems and self-concept. Gender differences, and differences in traumatic experiences will also be investigated between the groups by means of t-tests.

Ethics

Ethical approval will be sought from NHS Forth Valley, The Scottish Prison Service and The University of Edinburgh, School of Health in Social Science.

Participants

All participants will be adults, currently detained in two prisons in Scotland. Female participants will be recruited from a female only prison, HMP Cornton Vale. Male participants will be recruited from a male only prison, HMP Glenochil.

Informed consent

Participants will be approached by prison health care staff who will provide them with verbal information and a patient information sheet. This will detail: the aims of the study; what their involvement will require; confidentiality; how the results will be disseminated; the complaints procedure and steps to take should involvement in the study create any distress. It will also highlight that involvement in the study will not affect their routine care and management and that they will be free to withdraw at any time. If the prisoner consents to be contacted, contact will be made after at least 24 hours. They will be given the opportunity to ask questions, provided with further information and, if they wish to take part, a meeting will be arranged. Participants will be required to provide written consent to be included in the study.

Confidentiality

Participation in the study will be confidential. However, confidentiality may be breached if a participant is deemed to be of risk to them self or others. This will be detailed in the participant information sheet.

Data management

Data will be managed in line with the Data Protection Act (1998), NHS Code of Practice on Protecting Patient Confidentiality (2002), NHS Forth Valley Information Governance Policy and The University of Edinburgh Data Management Policy. Measures will be collected, coded and anonymised. Raw data and a key for identifying the coded data will be stored in locked filing cabinets in respective prisons to which only the investigators and NHS staff will have access. Data used for scoring and analysis will be anonymised, password protected and stored on prison computers. Transfer of anonymised data will be via encrypted NHS networks. Raw data will be disposed in confidential waste within 12 months of its collection. Following completion of the study anonymised data will be stored within the Edinburgh University repository for 10 years, following which its storage will be reviewed. Any potential further uses of the data will be outlined in the patient information sheet and consent form.

Procedure

Those participants who wish to take part will be given eight questionnaires, either by the principle researcher, or psychologists within in the prison service. Each self-report measure will be completed by the participant with the lead researcher, or a research assistant, present using an interview format. This format is required to facilitate engagement within the forensic setting. It is estimated that 60 minutes will be required to complete the battery of measures. Participants will have the opportunity for a break if fatigue is deemed to be affecting their performance. Following completion of the measures, participants will be provided with a written and verbal debriefing (to allow for literacy issues) thanking them for their involvement. The Global Assessment of Functioning (GAF) will be completed by qualified prison staff, with adequate knowledge of the participant.

5) Please list the principal inclusion and exclusion criteria (IRAS A17-1 and A17-2)

Inclusion criteria

- Male and females offenders over 18 years of age
- Currently serving custodial sentences at HMP Cornton Vale or HMP Glenochil
- Consented to participate

Exclusion criteria

- Prisoners deemed too emotionally or physically frail, by prison health care staff or the researchers
- Prisoners with a diagnosis of non-affective psychosis
- Prisoners with a known learning disability
- Prisoners with suicidal ideation or intent
- Unable to understand written or verbal English

6) How will data be collected?

If quantitative, list proposed measures and justify the use of these measures. If qualitative, explain how data will be collected giving reasonable detail. (Don't just say 'by interviews')

Data will be collected though nine measures as outlined below**:**

The PTSD Checklist for DSM-V (PCL-5; Weathers *et al*., 2013)

The PCL-5 is a 20-item, standardised, self-report questionnaire. It is split into four clusters assessing the DSM-V PTSD criteria: intrusive memories; avoidance; cognitions and mood; and arousal. Participants respond on a 4-point scale, as to how problematic a specific symptom was in the previous month from 'not and all' to 'extremely'. This questionnaire has been chosen as it is can give a provisional DSM-V PTSD diagnosis. The PCL-5 is a newly developed measure for DSM-V and is in the process of psychometric testing. It is a slight adaptation of the PCL-C for DSM-IV which has well established validity and reliability (Wilkins *et al.*, 2011).

ICD-11 Trauma Questionnaire (Cloitre *et al*., in preparation for submission)

The ICD-11 Trauma Questionnaire is 49-item, standardised, self-report questionnaire.

It assesses the presence of ICD-11 PTSD symptoms (re-experiencing, avoidance and hypervigilance); ICD-11 CPTSD symptoms (emotional dysregulation, impaired self-concept and interpersonal difficulties) and DSM-IV borderline personality disorder characteristics.

Respondents rate how much they have been bothered by a range of PTSD and CPTSD symptoms in the past month, on a 5-point scale 'from not at all' to 'extremely'. They also rate how much these symptoms have affected their relationships, work and other important areas of their life. For the BPD element of the questionnaire respondents rate whether a range of symptoms are true of them, answering 'yes' or 'no'.

This measure has been newly developed by Cloitre and colleagues in order to accurately measure CPTSD, in an attempt to overcome some of the methodologic limitations of existing research. It is currently undergoing reliability and validity testing. Preliminary analysis of USA data suggests that this is an acceptable, reliable and valid measure for the assessment of CPTSD. It was chosen as it is the only measure specifically designed to assess the presence of the proposed ICD-11 PTSD and CPTSD diagnoses.

The Childhood Trauma Questionnaire (CTQ; Bernstein and Fink, 1998)

The CTQ is a 28-item, standardised, self-report questionnaire that assesses for childhood emotional abuse, emotional neglect, sexual abuse, physical abuse and physical neglect. Participants select whether each of the items occurred to them during in childhood on a 5-point scale from "never true" to "very often true".

It was selected as it has been shown to have good reliability and validity in clinical, and community samples (Bernstein *et al*., 1997; Scher *et al*. 2001).

The Life Events Checklist (LEC-5; Gray *et al*., 2004).

The LEC is a 17-item, standardised, self-report questionnaire, designed to screen for potentially traumatic events a participant may have experienced. It assesses exposure to 16 events known to be linked to the development of PTSD, and includes one additional item assessing any other traumatic experience. For each item the participant selects whether the event: happened to them; they witnessed it; it was part of their job; leaned about it; if they are not sure if it applies to them; or if it does not apply to them.

The LEC-5 is newly developed for DSM-V and psychometrics are not currently available. However, changes from the original LEC are minimal. The LEC has established reliability and validity and was shown to be significantly related to a range of measures related to traumatic symptomatology (Gray *et al*., 2004), few psychometric differences are expected.

The Difficulties in Emotional Regulation Scale (DERS**;** Gratz & Roemer, 2014)

The DERS is a 36-item, standardised, self-report measure of difficulties in emotion regulation. It has six subscales assessing elements of emotion regulation: a lack of awareness of emotional responses; lack of clarity of emotional responses; non-acceptance of emotional responses; limited access to emotion regulation strategies; difficulties controlling impulses; and difficulties engaging in goal-directed behaviours. Participants rate how frequently each item applies about themselves on a 5-point scale from 'almost never' to 'almost always'

The DERS has high internal consistency, good test–retest reliability, and adequate construct and predictive validity (Gratz & Roemer, 2014). It provides measurement of the emotional dysregulation domain of the ICD-11 CPTSD diagnosis.

The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965)

The RSES is a 10-item, standardised, self-report measure of self-esteem. Respondents rate feeling about themselves on a 4-point scale from 'strongly agree' to 'strongly disagree'. It will provide measurement of the impaired self-concept domain of the ICD-11 CPTSD diagnosis. The scale has well established reliability and validity (Rosenberg, 1965).

The Inventory of Interpersonal Problems – 32 Item Version (IIP-32; Horowitz *et al.*, 2000)

The IIP is a 32-item, standardised, self-report measure of interpersonal difficulties. It is split into eight octants: domineering; vindictive; cold; socially avoidant; non-assertive; exploitable; overly nurturing; and intrusive.

It was chosen as it has been shown to have acceptable reliability; structural validity and is sensitive to clinical change (Soldz *et al*., 1995). It provides measurement of the interpersonal problems domain of the ICD-11 CPTSD diagnosis.

The Global Assessment of Functioning (GAF; Hall, 1995)

The GAF is a clinician administered scale which provides a clinical judgment of an individual's overall functioning level. Impairments in psychological, social and occupational functioning are taken into account, but those related to physical or environmental limitations are not. The scale ranges from 0 (inadequate information) to 100 (superior functioning). It has been shown to be a reliable and valid measure (Jones *et al.,* 1995)

The Standardised Assessment of Personality: Abbreviated Scale (SAPAS; Moran *et al.,* 2003).

The SAPAS is an 8-item, standardised, clinician administered measure which screens for personality disorder. Respondents answer yes or no to a number of questions. It was chosen as it has been shown to be an effective brief screen for personality disorders and has good reliability and validity (Moran *et al.,* 2003; Hesse & Moran, 2010). It will provide data on whether CPTSD is distinct from BPD.

Demographic data

Age, gender, marital status, educational status, work history prison sentence, and current psychotropic medication.

Sample Size

7) What sample size is needed for the research and how did you determine this? For quantitative projects, outline the relevant Power calculations and the rationale for assuming given effect sizes. For qualitative projects, outline your reasoning for assuming that this sample size will be sufficient to address the study's aims. (IRAS A59 and A60)

There is a range of evidence and guidance regarding the minimum sample size required for Confirmatory Factor Analysis. Recommendations tend to give either the minimum number of participants required, or the participant to variable ratio. Many recommend a minimum of 100 participants (e.g. MacCallum *et al*., 1999; Goruch, 1974). Hutcheson and Sofroniou recommend 150-300 participants, with numbers closer to 150 if the variables are highly correlated. Others recommend a ratio of 20 participants for each variable (Hogarty *et* al., 2005) or 10 participants for each item (Arrindell & van der Ende, 1985; Velicer & Fava, 1998).

The existing studies in to the symptom profiles of PTSD and CPTSD have performed analysis on groups of between 229 and 345 participants *(*Elklit *et al.,* 2014; Wolf *et al.*, 2014).The current study has 6 variables, measured by 15 items. It is thought that the scores on some variables will be highly correlated. Drawing on the above recommendations and previous research a sample size of 160 is presumed sufficient to achieve power of 0.8 at an alpha of p=0.05.

It has been estimated that sample size required for Latent Profile Analysis for a 3 class model, assuming a medium effect size, is 290 (Dziak, *et al*., 2014). In the event of achieving a sample nearing this number an exploratory LPA will be conducted.

8) Outline reasons for your confidence in being able to achieve a sample of at least this size. (e.g. by giving details of size of known available sample(s), percentage of this type of sample that typically participate in such studies, opinions of relevant individuals working in that area)

At any one time, HMP Cornton Vale holds 309 female inmates. Contact has been made with the head of psychology and the prison governors and they have indicated willingness to take part in the study. A recent study found that of a sample of n=95 participants from Cornton Vale 57% met DSM-V PTSD criteria, indicating significant levels of PTSD among inmates (Karatzias *et al*., 2015, in preparation). Acceptability of the study was high, with less than 20% of eligible prisoners declining participation in this study.

HMP Glenochil has a capacity of 670 male inmates and holds an average daily population of 660. Contact has been made with the head of psychology and the prison governors and they are keen to take part in the study. Geoff *et al.* (2007) conducted a systematic review which looked at the rates of PTSD among prison populations. They found only four studies which reported prevalence of PTSD in males, estimates ranged from 4-21%, with a mean of 11%. There is little evidence as to the rates of exposure to traumatic experiences among adult male offenders, however as a large number of people who experience trauma do not develop PTSD it is assumed to be significantly higher that the percentage of those with PTSD.

Therefore the two prisons have a total population at any one time of roughly n=960. Drawing on previous research a conservative estimate of the prevalence of traumatic experiences is 50%, if an additional 20% decline participation this leaves a potential sample of n=384. In addition, there will be a turn over of prisoners during the recruitment stage of the project. A research assistant, currently working with Prof. Karatzias, will be available to collect data in the initial stages of the study, increasing the potential to collect a large sample.

Analysis

9) Please describe the methods of analysis (statistical or other appropriate methods, e.g. for qualitative research) by which the data will be evaluated to meet the study

objectives.

A Confirmatory Factor Analysis (CFA) will be used to identify whether distinct profiles of symptoms, consistent with PTSD and CPTSD exist within the sample. Items measuring PTSD and CPTSD will be drawn from validated measures, the PCL-C, DERS and SAPAS. Table 1

shows the items used to identify PTSD and CPTSD domains. If sample size permits it would be possible to analyse the data using or Latent Profile Analysis.

To assess whether the groups identified by the CFA differ in terms of their traumatic experiences their scores on the CTQ, PTSD ICD-11 Trauma Questionnaire and LEC-5 will be compared using a series of AVOVAs or T-tests depending on the factor solution derived from the CFA.

In order to identify whether the groups differ on the domains related to disturbances in self-organisation their scores on measures of interpersonal problems (IIP), emotional regulation (DERS) and self concept (RSES), will be compared using a series of AVOVAs or t-tests depending on the factor solution derived from the CFA .

T-tests will be used to compare the symptom profiles of male and female groups.

In order to identify whether comorbid borderline personality disorder is associated with differences in profile between PTSD and CPTSD the presence of BPD will be treated as a categorical variable and entered into an MANOVA.

If sample size is large enough to maintain power, an exploratory latent profile analysis will be conducted. LPA is a technique for examining classes of individuals using continuous variables. LPA can be used to discover sub-types of a related disorder and is used in analyses looking at diagnostic categories.

Project Management: Timetable

10) Outline a timetable for completion of key stages of the project. (E.g. ethics submission, start and end of data collection, data analysis, completion of systematic review).
See table 2 below.

Table 1. Items entered into Confirmatory Factor Analysis

Factor	Cluster	Test items
PTSD	Re-experiencing	PCL-5 1. Repeated, disturbing unwanted memories of the stressful experience?
		PCL-5 2 Repeated, disturbing dreams of the stressful experience
		PCL-5 3. Suddenly feeling as if the stressful experience were actually happening again *(as if you were actually back there reliving it)*?
		PCL-5 4. Feeling very upset when something reminded you of the stressful experience (*for example, heart pounding, trouble breathing sweating)*?
		PCL-5 5. Having strong physical reactions when something reminded you of the stressful experience (*for example, heart pounding, trouble breathing, sweating)?*
	Avoidance	PCL-5 6. Avoiding memories, thoughts or feelings related to the stressful experience?
		PCL-5 7. Avoiding external reminders of the stressful experience (*for example, people, places, conversations, activities, objects or situations?)*
	Sense of threat	PCL-5 17. Being “superalert” or watchful or on guard?
		PCL-5 18. Feeling jumpy or easily startled?
CPTSD	Affect dysregulation	SAPA 4. Do you normally lose your temper easily?
		DERS 3. I experience my emotions as overwhelming and out of control
	Negative self-concept	DERS 25. When I’m upset, I feel guilty for feeling that way
		DERS 30. When I’m upset, I start to feel very bad about myself
	Interpersonal problems	SAPAS 1. In general do you have problems making and keeping friends?
		SAPAS 2. Would you normally describe yourself as a loner?

	2015							2016											
	Ju	Ju	Au	Se	Oc	No	De	Ja	Fe	Ma	Ap	Ma	Ju	Ju	Au	Se	Oc	No	De
Ethics submission																			
Meetings with prisons																			
Prison training																			
Methods draft write up																			
Systematic review methods																			
Systematic journal search																			
Systematic review write up																			
Data collection																			
Data analysis																			
Introduction write up																			
Results write up																			
Discussion write up																			
Final write up																			

Table 2. Project Management Timetable

Management of Risks to Project

11) Please summarise the main potential risks to your study, the perceived likelihood of occurrence of these risks and any steps you will or have taken to reduce these risks. Outline how you will respond to identified risks if they should occur.

Potential distress

When dealing with past traumatic experiences there is the potential of causing distress to participants. The perceived likelihood of the risk of this is low as the measures are routinely used in research and clinical practice, including by the Rivers Centre, a specialist trauma service. There is no evidence that completion of the measures causes distress. Participants will receive a participant information sheet, will be able to withdraw at any time and informed consent will be required. In the event that participation does cause distress Forensic Psychologists who are trained in dealing with emotional distress, will be available for support, this will be highlighted in the participant information sheet. Before participating in the study all participants will be discussed with prison staff and any deemed too emotionally or physically frail to take part excluded.

Sample Size

There is the potential that there will be difficulty recruiting an adequate number of participants to achieve power. The perceived likelihood of this risk is low, as the study will draw upon a large population**.** However, in the unlikely event that it is not possible to recruit sufficient participants to achieve statistical power, a matched community sample, taken from an existing data set, is available.

Disclosure of trauma

It is possible that participants will disclose trauma for the first time. The briefing sheet will outline the steps to take, and available supports in the event that a participant discloses traumatic experiences which they wish to discuss further.

Recruiting participants with single-incident trauma

Studies have found high number of those in prison settings have experienced multiple lifetime traumas (e.g. Green *et al*., 2007). Therefore it may not be possible to define enough individuals as experiencing single-incident trauma. This would make it impossible to answer research

question 3: “Is prolonged trauma more predictive of CPTSD, and is single-incident trauma more predictive of PTSD?”. However, it would still be possible to analyse the prevalence of traumatic experiences and symptoms in forensic settings, the symptom profile of a prison population who have experienced trauma and draw comparisons between male and female populations.

Knowledge Exchange

12) How do you intend to report and disseminate the results of the study? (IRAS A51)

This research project will be written up as part of a doctorate in clinical psychology. In addition, publication will be sought in the Journal of Traumatic Stress or The European Journal of Psychotraumatology. The results will also be fed back to relevant parties including the Scottish Prison Service.

13) What are the anticipated benefits or implications for services of the project? (E.g. If this is an NHS based project, in what way(s) is the project intended to benefit the NHS?)

The Mental Health Strategy for Scotland 2012-2015 makes a commitment to improve service response to psychological trauma and increase the availability of trauma informed interventions on the NHS. A greater understanding of the effects of complex trauma could inform the development of such interventions. In addition, an understanding of the gender differences in trauma presentations could impact how these interventions are delivered to males and females, potentially increasing efficacy.

The Mental Health Strategy also notes that the links between trauma and psychological difficulties are complex. Despite its prevalence, the effects of childhood trauma are under researched, particularly in males. This project will add to the understanding of traumatic symptomatology.

This project will add to the debate as to whether complex trauma is a distinct diagnostic category, potentially developing a more parsimonious account of PTSD with increased clinical utility.

The Report of the Commission on Women Offenders (2012) identified mental illness and personality disorder as a key factor in to women’s offending. It also identified the need to improve the treatment and support offered to women with borderline personality disorder, the need to increase access to psychological therapies within a prison population. This study will add to the limited evidence of the prevalence of PTSD among offenders.

14) Are there any potential costs to this project?

Outline any potential financial costs to the project, including the justification for the costs (why are these necessary for the research project?) and how funding will be obtained for these costs (how will cost be met?). Please separate these into potential costs for the University and potential costs for your NHS Health board and note that you should ask your NHS Health board to meet stationery, printing, postage and travel costs.

The Childhood Trauma Questionnaire costs £156.50 for the manual and an initial 25 questionnaires and £68.40 for every additional 25 questionnaires. This cost could be covered by the university, or split between the university and the NHS. Stationary costs will be covered by the NHS and the principal researcher. Travel costs will be covered by the principal researcher.

15) Any other relevant information.

16) Key References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.

Arrindell, W. A., & van der Ende. J. (1985). An empirical test of the utility of the observations-to-variables ratio in factor and components analysis. *Applied Psychological Measurement, 9*, 165 - 178.

Bernstein, D. P., Ahluvalia, T., Pogge, D., & Handelsman, L. (1997). Validity of the Childhood Trauma Questionnaire in an adolescent psychiatric population. *Journal of the American Academy of Child & Adolescent Psychiatry*, *36*(3), 340-348.

Bernstein, D. P., & Fink, L. (1998). *Childhood trauma questionnaire: A retrospective self-report: Manual*. Psychological Corporation.

Blain, L. M., Galovski, T. E., & Robinson, T. (2010). Gender differences in recovery from posttraumatic stress disorder: A critical review. *Aggression and violent behavior*, *15*(6), 463-474.

Cloitre, M., Garvert, D. W., Brewin, C. R., Bryant, R. A., & Maercker, A. (2013). Evidence for proposed ICD-11 PTSD and complex PTSD: A latent profile analysis. *European Journal of Psychotraumatology, 4,* 20706.

Cloitre, M., Garvert, D. W., Weiss, B., Carlson, E. B., & Bryant, R. A. (2014). Distinguishing PTSD, Complex PTSD, and Borderline Personality Disorder: A latent class analysis. *European journal of psychotraumatology*, *5*.

Courtois, C. C. (2004). Complex Trauma, complex reactions: Assessment and treatment, *Psychotherapy: Theory, Research, Practice, Training*, 2004, Vol 41(4), 412-425.

Davison, S., Leese, M., & Taylor, P. J. (2001). Examination of the screening properties of the Personality Diagnostic Questionnaire 4+(PDQ-4+) in a prison population. *Journal of Personality Disorders*, *15*(2), 180-194.

Driessen, M., Beblo, T., Reddemann, L., Rau, H., Lange, W., Silva, A., *et al.* (2002). [Is the borderline personality disorder a complex post-traumatic stress disorder?-The state of research]. *Der Nervenarzt*, *73*(9), 820-829.

Dziak, J. J., Lanza, S. T., & Tan, X. (2014). Effect Size, Statistical Power, and Sample Size Requirements for the Bootstrap Likelihood Ratio Test in Latent Class Analysis. *Structural equation modeling: a multidisciplinary journal*, *21*(4), 534-552.

Elklit, A., Hyland, P. & Shevlin, M. (2014). Evidence of symptom profiles consistent with posttraumatic stress disorder and complex posttraumatic stress disorder in different trauma samples. *European Journal of Psychotraumatology*, *5*, 24221.

Fossati, A., Madeddu, F., & Maffei, C. (1999). Borderline personality disorder and childhood sexual abuse: a meta-analytic study. *Journal of personality disorders*, *13*(3), 268-280.

Friedman, M. J., Resick, P. A., Bryant, R. A., & Brewin, C. R. (2011). Considering PTSD for DSM- 5. *Depression and anxiety*, *28*(9), 750-769.

Goff, A., Rose, E., Rose, S., & Purves, D. (2007). Does PTSD occur in sentenced prison populations? A systematic literature review. *Criminal Behaviour and Mental Health*, *17*(3), 152-162.

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment*, *26*(1), 41-54.

Gray, M. J., Litz, B. T., Hsu, J. L., & Lombardo, T. W. (2004). Psychometric properties of the life events checklist. *Assessment*, *11*(4), 330-341.

Green, B. L., Miranda, J., Daroowalla, A., & Siddique, J. (2005). Trauma exposure, mental health functioning, and program needs of women in jail. *Crime & Delinquency*, *51*(1), 133-151.

Hall, R. C. (1995). Global assessment of functioning: a modified scale. Psychosomatics, 36(3), 267-275.

Herman, J. L. (1992). Complex PTSD: A syndrome in survivors of prolonged and repeated trauma. *Journal of traumatic stress*, *5*(3), 377-391.

Hesse, M., & Moran, P. (2010). Screening for personality disorder with the Standardised Assessment of Personality: Abbreviated Scale (SAPAS): further evidence of concurrent validity. *BMC psychiatry*, *10*(1), 10.

Hogarty, K. Y., Hines, C. V., Kromrey, J. D., Ferron, J. M., & Mumford K. R. (2005). The quality of factor solutions in exploratory factor analysis: The influence of sample size, communality, and overdetermination. *Educational and Psychological Measurement, 65*, 202-226.

Horowitz, L. M., Alden, L. E., Wiggins, J. S., & Pincus, A. L. (2000). IIP: Inventory of interpersonal problems. San Antonio, TX: The Psychological Corporation.

Hutcheson, G., & Sofroniou, N. (1999). *The multivariate social scientist: Introductory statistics using generalized linear models*. Thousand Oaks, CA: Sage Publications

Hyler, S.E. (1994). *PDQ-4+ Personality Diagnostic Questionnaire-4+*. New York: New York State Psychiatric Institute. 328.

Jones, S. H., Thornicroft, G., Coffey, M., & Dunn, G. (1995). A brief mental health outcome scale-reliability and validity of the Global Assessment of Functioning (GAF). The British Journal of Psychiatry, 166(5), 654-659.

Gorsuch, R. L. (1983). *Factor analysis* (2nd ed.). Hillsdale, NJ: Erlbaum.

Karatzias (2005). *Prevalence of PTSD in a female prison population.* Manuscript in preperation.

Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of general psychiatry*, *52*(12), 1048-1060.

Knefel, M., & Lueger-Schuster, B. (2013). An evaluation of ICD-11 PTSD and complex PTSD criteria in a sample of adult survivors of childhood institutional abuse. *European Journal of Psychotraumatology, 4,* 22608

Lewis, K. L., & Grenyer, B. F. (2009). Borderline personality or complex posttraumatic stress disorder? An update on the controversy. *Harvard review of psychiatry*, *17*(5), 322-32.

MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological methods*, *4*(1), 84.

Maercker, A., Brewin, C. R., Bryant, R. A., Cloitre, M., Reed, G. M., van Ommeren, *et al.*(2013). Proposals for mental disorders specifically associated with stress in the International Classification of Diseases-11. *The Lancet*, *381*(9878), 1683-1685.

Miller, M. W., & Resick, P. A. (2007). Internalizing and externalizing subtypes in female sexual assault survivors: Implications for the understanding of complex PTSD. *Behavior therapy*, *38*(1), 58-71.

Moran, P., Leese, M., Lee, T., Walters, P., Thornicroft, G., & Mann, A. (2003). Standardised Assessment of Personality–Abbreviated Scale (SAPAS): preliminary validation of a brief screen for personality disorder. *The british journal of psychiatry*, *183*(3), 228-232.

Olff, M., Langeland, W., Draijer, N., & Gersons, B. P. (2007). Gender differences in posttraumatic stress disorder. *Psychological bulletin*, *133*(2), 183.

PCT, P. C. T. (1998). Data protection act 1998.

Reed, G. M., Correia, J. M., Esparza, P., Saxena, S., & Maj, M. (2011). The WPA- WHO Global Survey of Psychiatrists' Attitudes Towards Mental Disorders Classification. *World Psychiatry*, *10*(2), 118-131.

Rosenberg, M. (1965). Rosenberg self-esteem scale (RSE). *Acceptance and commitment therapy. Measures package*, *61*.

Scher, C. D., Stein, M. B., Asmundson, G. J., McCreary, D. R., & Forde, D. R. (2001). The childhood trauma questionnaire in a community sample: psychometric properties and normative data. *Journal of traumatic stress*, *14*(4), 843-857.

Scottish Executive. (2002). *Condfidentiality: NHS Code of Practice.* Confidentiality and Security Advisory Group for Scotland.

The Scottish Government. (2012). *Mental Health Strategy for Scotland 2012-2015.* Edinburgh: APS Group Scotland.

The Scottish Government. (2012). *Report of the Commission of Women Offenders.*

Soldz, S., Budman, S., Demby, A., & Merry, J. (1995). A short form of the inventory of interpersonal problems circumples scales. *Assessment*, *2*(1), 53-63.

Timmerman, I. G., & Emmelkamp, P. M. (2001). The relationship between traumatic experiences, dissociation, and borderline personality pathology among male forensic patients and prisoners. *Journal of personality disorders*, *15*(2), 136-149.

Tolin, D. F., & Foa, E. B. (2006). Sex differences in trauma and posttraumatic stress disorder: a quantitative review of 25 years of research. *Psychological bulletin*, *132*(6), 959.

Velicer, W. F., & Fava, J. L. (1998). Effects of variable and subject sampling on factor pattern recovery. *Psychological Methods, 3*, 231-251.

Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). The PTSD Checklist for DSM-5 (PCL-5). *Scale available from the National Center for PTSD. www.ptsd.va.gov*.

Wilkins, K. C., Lang, A. J., & Norman, S. B. (2011). Synthesis of the psychometric properties of the PTSD checklist (PCL) military, civilian, and specific versions. Depression and anxiety, 28(7), 596-606.

Wolf, E. J., Miller, M. W., Kilpatrick, D., Resnick, H. S., Badour, C. L., Marx, B. P.. *et al.* (2015). ICD–11 Complex PTSD in US National and Veteran Samples Prevalence and Structural Associations With PTSD. *Clinical Psychological Science*, *3*(2), 215-229.

17) Confirmation of Supervisors' Approval

I confirm that both my academic and clinical supervisors have seen and approved this research proposal and have both completed the supervisors' appraisal forms below.

Yes

Appendix 1:

Methodological Review

Main Academic Thesis Supervisor's Appraisal of Project Risk

Supervisor's Name: Angus MacBeth

Do you consider that the project should proceed in broadly its current form?

(Delete as appropriate)

Yes

Please outline the reasons for your response. In particular, highlight any areas of risk to the completion of the project that have not been fully addressed within the proposal and any steps that could be taken to reduce risks:

Project is novel, both with regards to investigation of psychological processes in C-PTSD, and also in exploring trauma in forensic population. Clinical supervisor and associated network well placed to support project. Main risk to project is failure to recruit optimal sample size, due to truncated 2.5 year timeframe of Doctorate. However, analysis plan is robust enough that meaningful analyses could still be conducted.

Date: 03/06/15

Appendix 2:

Methodological Review

Clinical Thesis Supervisor's Appraisal of Project Risk

Supervisor's Name: Thanos Karatzias

Position: Professor of Mental Health, Clinical Psychologist

Do you consider that the project should proceed in broadly its current form?

(Delete as appropriate)

Yes Yes, subject to revisions outlined below No

This project replicates our current research in the Rivers Centre for Traumatic Stress in preparation for ICD 11. The proposed work is highly original because complexPTSD as a distinct diagnostic category has never been explored in a prison population and therefore findings will make a significant contribution to the literature. From my experience in conducting research with prison population and considering that this is a cross sectional piece of work, I believe that the risk of project completion is small. There is however a risk that the candidate will not be able to recruit a sample of participants with a history of single traumatic life events indicating that any findings will be generalizable to a multiply traumatized population. This is consistent with previous evidence concerning the nature of traumatization in this population group.

Date: 3/6/15

Appendix I Original study protocol

Symptom profiles of men and women in forensic services who have experienced trauma (evidence for proposed ICD-11 PTSD and complex PTSD).

Protocol Version 2. 1 (21.01.15)

Contacts Page

Chief Investigator:
Mr Richard Browne*
Trainee Clinical Psychologist
University of Edinburgh and NHS Lothian
Email: s1475214@ed.ac.uk

Supervisors:
Dr Angus MacBeth
Lecturer in Clinical Psychology
University of Edinburgh
Email: angus.macbeth@ed.ac.uk

Dr Elizabeth Flynn,
Consultant Forensic Clinical Psychologist
NHS Forth Valley
Email: elizabethflynn@nhs.net

Prof. Thanos Karatzias
Clinical Psychologist / Lecturer in Clinical Psychology
Rivers Centre / Edinburgh Napier University
Email: t.karatzias@napier.ac.uk

Co-investigators
Annalee Wilkie
Forensic Psychologist
HMP Glenochil
Email: annalee.wilkie@sps.pnn.gov.uk

*Protocol author

Contents

Contacts Page	2
Abbreviations	4
Study Synopsis	5
Introduction	6
Aims	7
Research Questions	8
Method of Investigation	8
Data Management	11
Data Analysis	12
Rick Management	13
Dissemination	14
Anticipated Benefits	14
References	15

List of abbreviations

PTSD	Post traumatic stress disorder
CPTSD	Complex Post traumatic stress disorder
WHO	World Health Organisation
ICD-11	International Classification of Diseases -No. 11
LPA	Latent profile analysis
CTQ	Childhood Trauma Questionnaire
PCL-5	The PTSD Checklist for DSM-V
LEC-5	The Life Events Checklist (LEC-5
DERS	The Difficulties in Emotional Regulation Scale (DERS
RSES	The Rosenberg Self-Esteem Scale
IIP-32	The Inventory of Interpersonal Problems – 32 Item Version
SAPAS	The Standardised Assessment of Personality: Abbreviated Scale
(CFA)	Confirmatory Factor Analysis

Study synopsis

Title of Study	Symptom profiles of men and women in forensic services who have experienced trauma (evidence for proposed ICD-11 PTSD and complex PTSD).
Study Centres	HMP Glenochil University of Edinburgh, School of Health in Social Science
Duration of Study	2 years
Objectives	Investigate whether a symptom profile consistent with the proposed ICD-11 CPTSD diagnosis exists in a forensic population. Investigate the prevalence of traumatic experiences and PTSD in a prison population.
Study Endpoint	This study will end once final data analysis have been completed
Methodology	Cross-sectional, quantitative design using self report questionnaires
Sample Size	80 inmates in HMP Glenochil.
Inclusion Criteria	Male offenders over 18 years of age Currently serving custodial sentences at HMP Glenochil Consented to participate
Exclusion Criteria	Prisoners deemed emotionally or physically frail, by prison health care staff or the researchers Prisoners with a diagnosis of non-affective psychosis Prisoners with a known learning disability Prisoners with suicidal ideation or intent
Statistical Analysis	Confirmatory Factor Analysis AVOVAs T-tests MANOVA.

Introduction

The forthcoming edition of the WHO ICD-11 has proposed two related, but distinct, diagnoses for people with trauma symptoms: post-traumatic stress disorder (PTSD) and complex post-traumatic stress disorder (CPTSD) (Maercker et al., 2013). The proposed diagnostic criteria for PTSD have been simplified from ICD-10, incorporating six symptoms, in three clusters: re-experiencing of the traumatic event; avoidance of traumatic reminders; and a sense of threat that is manifested in hypervigilance or increased startle reaction. Proposed diagnostic criteria for CPTSD involves the presence of the core elements of PTSD, with at least one additional symptom from each of three domains related to disturbances in self-organisation: poor affect regulation; negative self-concept and interpersonal difficulties.

A number of studies have found evidence supporting ICD-11's conceptualisation of PTSD and CPTSD. Cloitre et al. (2013) performed a latent profile analysis (LPA) on 302 treatment-seeking individuals who had experienced a range of traumatic events. Three classes of individuals were revealed: a PTSD class who presented with symptoms of PTSD and low levels of disturbance in self-organisation; a complex PTSD class, with symptoms of PTSD and additional disturbances in self-organisation; and a low symptom class, with low levels of symptoms across PTSD and CPTSD domains. It was found that prolonged trauma was more closely related to CPTSD than PTSD, and single incident trauma was more closely related to PTSD than CPTSD. However, this study included a high proportion of the participants had experienced both repeated interpersonal traumas and a single incident trauma, making it difficult to draw conclusions about the effect of trauma history on the development of symptoms.

Adding evidence for the ICD-11 proposal, Knefel and Lueger-Schuster (2013) examined the prevalence and symptom profile of ICD-11 PTSD and CPTSD among 229 survivors of institutional abuse, using confirmatory factor analysis. They found a prevalence rate of 17% for PTSD, and 21.4% for CPTSD. It was also found that prolonged traumatic experiences increased the likelihood of meeting criteria for CPTSD.

Elklit et al. (2014) investigated whether the distinction between PTSD and CPTSD symptom profiles was maintained in three groups of traumatised individuals: people who had experienced a sexual assault; a physical assault; or the loss of a child. In line with Cloitre et al. (2013) they found that a three class model was the best fit for each group. They also found that sexual assault was the most predictive of developing CPTSD followed by physical assault and bereavement.

However, the above studies have some limitations. All three used individual items from measures to assess the CPTSD domains, raising questions about their reliability and validity. Also, all the studies have used specific samples, limiting generalisability. In addition, each is based on retrospective data.

Not all studies have supported the ICD-11 diagnoses of CPTSD and PTSD. Wolf et al. (2014) applied ICD-11 PTSD and CPTSD criteria to two American samples: 323 trauma-exposed veterans and 345 trauma-exposed community participants. However, they found that a four-class model was the best fit, with classes differing in their degree of symptom severity, and not PTSD or CPTSD diagnosis. They also found that the neither trauma history, nor the number of traumatic events a participant experienced varied across the PTSD or CPTSD group. They argue that CPTSD is better conceptualised as features of PTSD associated to the severity of the trauma, as opposed to a distinct presentation of traumatic-symptomatology. However, this

study developed a measure of the disturbances in self-organisation which has not been validated, therefore it is not possible to conclude whether the results reflect the true symptom profile of PTSD and CPTSD or are an artefact of this new measure.

Gender Differences in PTSD

Men have been shown to be more likely than women to experience every type of trauma other than sexual abuse and rape (Kessler et al., 1995; Blain et al., 2010). However, the lifetime prevalence of PTSD is significantly higher in females than males, and this effect holds across a range of traumatic experiences (Kessler et al., 1995; Tonlin & Foa, 2006).

Knefel and Lueger-Schuster (2013) carried out gender-specific analyses of the prevalence of ICD-11 PTSD and CPTSD. They found no gender differences in PTSD diagnosis but a significant gender difference in the rates of CPTSD. It may be that the current conceptualisation of CPTSD excludes some male presentations. Miller and Resick (2007) found that men who had experienced complex trauma displayed more externalising symptoms, with females presenting with more internalising symptoms.

PTSD in Prison Populations

There is little research into the prevalence of PTSD in prison populations, although there is evidence for high levels of exposure to childhood trauma in this group (Timmerman and Emmelkamp; 2001). However, with regard to diagnosed PTSD Geoff et al. (2007) conducted a systematic review on the topic, and found only four studies. In these studies prevalence of PTSD ranged from 4% - 21.4%. The only study looking at prevalence of PTSD in a UK prison population found that 57%, of a sample of 95 females, met DSM-V PTSD criteria (Karatzias et al., 2015, in preparation).

The proposed study will be the first to look at symptom profiles of PTSD and CPTSD in a forensic population. It will also be the first to compare the symptom profiles of males and females. In order to overcome some of the methodological weakness of the previous studies it will include a measure of each of the proposed CPTSD domains, and will apply measures prospectively. In addition, it will include a measure of BPD in-order to gather evidence as to whether CPTSD represents PTSD with comorbid BPD.

Aims

(A) Investigate whether a symptom profile consistent with the proposed ICD-11 CPTSD diagnosis exists in a forensic population.

(B) Investigate the prevalence of traumatic experiences and PTSD in a prison population.

Research Questions

1. Can a distinct profile of symptoms and psychological functioning
2. What is the prevalence of PTSD and CPTSD in a forensic population?

3. Are borderline PD symptoms associated with differences in profile between individuals who have experienced a single trauma compared with a complex trauma?

4. consistent with Complex PTSD be identified in a forensic population

Method of investigation

Design

The study uses a cross-sectional design with one assessment point. An initial pilot phase of the study will be conducted at HMP Glenochil. This phase of the study will aim to recruit 20 participants. The researcher will liaise with the health service staff to closely monitor any impact on existing mental health services. If the study is deemed to cause a significant increase in distress or referral rates the study will be discontinued. If the pilot is successful recruitment will be expanded to include additional participants at HMP Glenochil.

Participants

All participants will be adult males currently serving custodial sentences at HMP Glenochil. This study will attempt to recruit a sample of n=80 and compare with an existing community data set of 80 participants

Inclusion criteria

3. Male offenders over 18 years of age
4. Currently serving custodial sentences at HMP Glenochil
5. Consented to participate

Exclusion criteria

- Prisoners deemed too emotionally or physically frail, by prison health care staff or the researchers
- Prisoners with a diagnosis of non-affective psychosis
- Prisoners with a known learning disability
- Prisoners with suicidal ideation or intent

Procedure

Identification of participants at recruitment sites

The participant information sheet will be delivered to all prisoners at HMP Glenochil, through the internal mail service. Interested parties can respond with an addressed envelope to the lead researcher, again using internal prison mail. If they do so contact will be made, and a meeting arranged.

Informed consent

Participants will be provided with a patient information sheet. This will detail: the aims of the study; what their involvement will require; confidentiality; how the results will be disseminated; the complaints procedure and steps to take should involvement in the study create any distress. It will also highlight that involvement in the study will not affect their routine care and management and that they will be free to withdraw at any time. If the prisoner confirms willingness to be approached by the researchers they will be contacted to arrange a mutually convenient time for an appointment. During this appointment the researcher will further explain the aims of the study and answer any questions. If the prisoner agrees to be involved, inclusion and exclusion criteria will be confirmed and signed consent will be obtained.

Data collection

The participant will then be given eight questionnaires. Each self-report measure will be completed by the participant with the lead researcher, or a research assistant, present using an interview format. This format is required to facilitate engagement within the forensic setting. It is estimated that 60 minutes will be required to complete the battery of measures. Participants will have the opportunity for a break if fatigue is deemed to be affecting their performance. Following completion of the measures, participants will be provided with a written and verbal debriefing (to allow for literacy issues) thanking them for their involvement.

Measures

The Childhood Trauma Questionnaire (CTQ; Bernstein and Fink, 1998)

The CTQ is a 28-item, standardised, self-report questionnaire that assesses for childhood emotional abuse, emotional neglect, sexual abuse, physical abuse and physical neglect.

Participants select whether each of the items occurred to them during in childhood on a 5-point scale from “never true” to “very often true”.

The PTSD Checklist for DSM-V (PCL-5; Weathers et al., 2013)

The PCL-5 is a 20-item, standardised, self-report questionnaire. It is split into four clusters assessing the DSM-V PTSD criteria: intrusive memories; avoidance; cognitions and mood; and arousal. Participants respond on a 4-point scale, as to how problematic a specific symptom was in the previous month from ‘not and all’ to ‘extremely’.

ICD-11 Trauma Questionnaire (Cloitre et al., in preparation for submission)

The ICD-11 Trauma Questionnaire is 49-item, standardised, self-report questionnaire.

It assesses the presence of ICD-11 PTSD symptoms (re-experiencing, avoidance and hypervigilance); ICD-11 CPTSD symptoms (emotional dysregulation, impaired self-concept and interpersonal difficulties) and DSM-IV borderline personality disorder characteristics. Respondents rate how much they have been bothered by a range of PTSD and CPTSD symptoms in the past month, on a 5-point scale ‘from not at all’ to ‘extremely’. They also rate how much these symptoms have affected their relationships, work and other important areas of their life. For the BPD element of the questionnaire respondents rate whether a range of symptoms are true of them, answering ‘yes’ or ‘no’.

The Life Events Checklist (LEC-5; Gray et al., 2004).

The LEC is a 17-item, standardised, self-report questionnaire, designed to screen for potentially traumatic events a participant may have experienced. It assesses exposure to 16 events known to be linked to the development of PTSD, and includes one additional item assessing any other traumatic experience. For each item the participant selects whether the event: happened to them; they witnessed it; it was part of their job; leaned about it; if they are not sure if it applies to them; or if it does not apply to them.

The Difficulties in Emotional Regulation Scale (DERS; Gratz & Roemer, 2014)

The DERS is a 36-item, standardised, self-report measure of difficulties in emotion regulation. It has six subscales assessing elements of emotion regulation: a lack of awareness of emotional

responses; lack of clarity of emotional responses; non-acceptance of emotional responses; limited access to emotion regulation strategies; difficulties controlling impulses; and difficulties engaging in goal-directed behaviours. Participants rate how frequently each item applies about themselves on a 5-point scale from 'almost never' to 'almost always'

The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965)

The RSES is a 10-item, standardised, self-report measure of self-esteem. Respondents rate feeling about themselves on a 4-point scale from 'strongly agree' to 'strongly disagree'. It will provide measurement of the impaired self-concept domain of the ICD-11 CPTSD diagnosis.

The Inventory of Interpersonal Problems – 32 Item Version (IIP-32; Horowitz et al., 2000)

The IIP is a 32-item, standardised, self-report measure of interpersonal difficulties. It is split into eight octants: domineering; vindictive; cold; socially avoidant; non-assertive; exploitable; overly nurturing; and intrusive.

The Standardised Assessment of Personality: Abbreviated Scale (SAPAS; Moran et al., 2003).

The SAPAS is an 8-item, standardised, clinician administered measure which screens for personality disorder. Respondents answer yes or no to a number of questions.

Demographic data:

Age, gender, marital status, educational status, work history, prison sentence, and current psychotropic medication.

Confidentiality

Participation in the study will be confidential. However, confidentiality may be breached if a participant is deemed to be of risk to them self or others. This will be detailed in the participant information sheet.

Data management

Data will be managed in line with the Data Protection Act (1998), NHS Code of Practice on Protecting Patient Confidentiality (2002), NHS Forth Valley Information Governance Policy and The University of Edinburgh Data Management Policy. Measures will be collected, coded and anonymised. Raw data and a key for identifying the coded data will be stored in locked filing cabinets in respective prisons to which only the investigators and NHS staff will have access.

Data used for scoring and analysis will be anonymised, password protected and stored on prison computers. Transfer of anonymised data will be via encrypted NHS networks. Raw data will be disposed in confidential waste within 12 months of its collection. Following completion of the study anonymised data will be stored within the Edinburgh University repository for 10 years, following which its storage will be reviewed. Any potential further uses of the data will be outlined in the patient information sheet and consent form.

Data analysis

A Confirmatory Factor Analysis (CFA) will be used to identify whether distinct profiles of symptoms, consistent with PTSD and CPTSD exist within the sample. Items measuring PTSD and CPTSD will be drawn from validated measures, the PCL-C, DERS and SAPAS.

To assess whether the groups identified by the CFA differ in terms of their traumatic experiences their scores on the CTQ, PTSD ICD-11 Trauma Questionnaire and LEC-5 will be compared using a series of AVOVAs or T-tests depending on the factor solution derived from the CFA.

In order to identify whether the groups differ on the domains related to disturbances in self-organisation their scores on measures of interpersonal problems (IIP), emotional regulation (DERS) and self concept (RSES), will be compared using a series of AVOVAs or t-tests depending on the factor solution derived from the CFA .

T-tests will be used to compare the symptom profiles of male and female groups.

In order to identify whether comorbid borderline personality disorder is associated with differences in profile between PTSD and CPTSD the presence of BPD will be treated as a categorical variable and entered into an MANOVA.

Risk management

Potential distress

When dealing with past traumatic experiences there is the potential of causing distress to participants. The perceived likelihood of the risk of this is low as the measures are routinely used in research and clinical practice, including by the Rivers Centre, a specialist trauma service. There is no evidence that completion of the measures causes distress. Participants will receive a participant information sheet, will be able to withdraw at any time and informed consent will be required.

In the event that participants do display distress this will initially be managed by the researcher in session. If distress is of a level above that which can be managed in session, the researcher will signpost the participant to the appropriate mental health support within the prison, this will be highlighted in the participant information sheet. In HMP Glenochil this process involves identifying the participant to prison health care staff, and making a referral to the prison psychiatrist for further assessment.

Data protection and confidentiality

Participation in the study will be confidential. However, confidentiality may be breached if a participant is deemed to be of risk to them self or others. This will be detailed in the participant information sheet. This procedure adheres with Section 7.1 if the British Psychological Society's Code of Conduct, ethical Principles and Guidelines (2006). Raw data and a key for identifying the coded data will be stored in separate locked filing cabinets in respective prisons to which only the investigators and NHS staff will have access. Data used for scoring and analysis will be anonymised, password protected and stored on prison computers. Transfer of anonymised data will be via encrypted NHS networks.

Dissemination

This research project will be written up as part of a doctorate in clinical psychology. In addition, publication will be sought in the Journal of Traumatic Stress or The European Journal of Psychotraumatology. The results will also be fed back to relevant parties including the Scottish Prison Service.

Anticipated benefits of the study

The Mental Health Strategy for Scotland 2012-2015 makes a commitment to improve service response to psychological trauma and increase the availability of trauma informed interventions on the NHS. A greater understanding of the effects of complex trauma could inform the development of such interventions. In addition, an understanding of the gender differences in trauma presentations could impact how these interventions are delivered to males and females.

This project will add to the debate as to whether complex trauma is a distinct diagnostic category, potentially developing a more parsimonious account of PTSD with increased clinical utility. This is particularly relevant due to the finding that clinicians prefer a limited number of symptoms to inform diagnosis (Reed et al., 2011).

This study will add to the limited evidence of the prevalence of PTSD among offenders, and will be the first to look at the prevalence of PTSD in a male prison population.

Study timetable

Task	Date
Ethics applications and meeting with prison personnel	Nov 2015 – Jan 2016
Data collection	Jan 2016 - Dec 2016
Data analysis	Dec 2015 - Jan 2017
Write up	Jan 2017 - Apr 2017

References

Blain, L. M., Galovski, T. E., & Robinson, T. (2010). Gender differences in recovery from posttraumatic stress disorder: A critical review. *Aggression and violent behavior*, *15*(6), 463-474.

Cloitre, M., Garvert, D. W., Brewin, C. R., Bryant, R. A., & Maercker, A. (2013). Evidence for proposed ICD-11 PTSD and complex PTSD: A latent profile analysis. *European Journal of Psychotraumatology, 4,* 20706.

Elklit, A., Hyland, P. & Shevlin, M. (2014). Evidence of symptom profiles consistent with posttraumatic stress disorder and complex posttraumatic stress disorder in different trauma samples. *European Journal of Psychotraumatology*, *5*, 24221.

Geoff, A., Rose, E., Rose, S., & Purves, D. (2007). Does PTSD occur in sentenced prison populations? A systematic literature review. *Criminal Behaviour and Mental Health*, *17*(3), 152-162.

Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of general psychiatry*, *52*(12), 1048-1060.

Knefel, M., & Lueger-Schuster, B. (2013). An evaluation of ICD-11 PTSD and complex PTSD criteria in a sample of adult survivors of childhood institutional abuse. *European Journal of Psychotraumatology, 4,* 22608

Maercker, A., Brewin, C. R., Bryant, R. A., Cloitre, M., Reed, G. M., van Ommeren, *et al.*(2013). Proposals for mental disorders specifically associated with stress in the International Classification of Diseases-11. *The Lancet*, *381*(9878), 1683-1685.

Miller, M. W., & Resick, P. A. (2007). Internalizing and externalizing subtypes in female sexual assault survivors: Implications for the understanding of complex PTSD. *Behavior therapy*, *38*(1), 58-71.

Timmerman, I. G., & Emmelkamp, P. M. (2001). The relationship between traumatic experiences, dissociation, and borderline personality pathology among male forensic patients and prisoners. *Journal of personality disorders*, *15*(2), 136-149.

Tolin, D. F., & Foa, E. B. (2006). Sex differences in trauma and posttraumatic stress disorder: a quantitative review of 25 years of research. *Psychological bulletin*, *132*(6), 959.

Wolf, E. J., Miller, M. W., Kilpatrick, D., Resnick, H. S., Badour, C. L., Marx, B. P.. *et al.* (2015). ICD–11 Complex PTSD in US National and Veteran Samples Prevalence and Structural Associations With PTSD. *Clinical Psychological Science*, *3*(2), 215-229.