A Systematic Literature Review of Factor Analytic and Mixture Models of ICD-11 PTSD and CPTSD using the International Trauma Questionnaire.

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Abstract

The 11th version of the International Classification of Diseases (ICD-11; WHO, 2018) describes two distinct trauma related disorders, Posttraumatic Stress Disorder (PTSD) and Complex PTSD (CPTSD). This review aims to summarise and synthesize evidence from factor analytic and mixture modelling studies that have investigated the latent structure of the International Trauma Questionnaire. A systematic search of PsycInfo, Web of Science, Scopus and Pubmed databases was conducted to identify relevant articles. Thirty-two studies met the inclusion criteria for this systematic review. The latent structure of the ITQ was best represented by two models; a correlated six-factor model (Re-experiencing, Avoidance, Threat, Affect Dysregulation, Negative Self Concept, and Disturbed Relationships) and a two-factor second-order model (PTSD and Disturbances in Self-Organization). Mixture model studies consistently identified distinct classes representing those displaying PTSD and CPTSD symptoms. Numerous studies demonstrated support for the factorial and discriminant validity of PTSD and CPTSD when analysed in conjunction with other variables. Overall, support was found for the conceptual coherence of PTSD and CPTSD as empirically distinguishable disorders, as measured by the ITQ. The available evidence demonstrates that the ITQ is a valid measure of ICD-11 PTSD and CPTSD. Recommendations for future research are included.

Keywords: International Trauma Questionnaire, ICD-11 CPTSD, Factor Structure, Latent Classes, Systematic Review.

A Systematic Literature Review of Factor Analytic and Mixture Models of ICD-11 PTSD and CPTSD using the International Trauma Questionnaire.

The 11th version of the International Classification of Diseases (ICD-11; World Health Organisation, 2018) describes two trauma-related disorders: Posttraumatic Stress Disorder (PTSD) and Complex PTSD (CPTSD). Diagnosis of PTSD requires (1) re-experiencing in the here and now (RE), (2) avoidance of traumatic reminders (AV) and (3) sense of current threat (TH). CPTSD includes these core PTSD symptom clusters in addition to the symptom clusters of (1) affective dysregulation (AD), (2) negative self-concept (NSC), and (3) disturbances in relationships (DR), collectively referred to as "Disturbances in Self-Organisation" (DSO; Maercker et al., 2013). Both disorders require traumatic exposure and evidence of functional impairment for diagnosis, and the two conditions are distinguished on the basis of their symptom presentation. Type of traumatic exposure is considered a risk factor rather than a prerequisite for a differential diagnosis (Cloitre et al., 2020; Hyland et al., 2017), however, CPTSD was theorized to occur more commonly following trauma exposure that was prolonged, repeated, interpersonal in nature, and inescapable (Cloitre et al., 2013).

The International Trauma Questionnaire (ITQ; Cloitre et al., 2015) was developed as a self-report measure for the assessment of ICD-11 PTSD and CPTSD diagnoses. The development of the PTSD items was based on the work of Brewin et al. (2009) and the selection of DSO items was based on results from DSM-V field trials which investigated the most frequently reported CPTSD symptoms (van der Kolk et al., 2005) and results from an expert opinion survey where clinicians were asked to identify the most common and impairing CPTSD symptoms (Cloitre et al., 2011). The selection of items for the finalised 12-item ITQ was based on results from Item Response Models which assessed the performance

of each of the individual symptom indicators (Cloitre et al., 2018). Research demonstrated support for the convergent and discriminant validity of a preliminary 23-item version of the ITQ (Karatzias et al., 2016, Hyland et al., 2017). In keeping with the WHO's organising principle for the ICD-11 of maximizing clinical utility via a focus on a small number of core symptoms for each disorder (Reed, 2010), a finalised 12-item version of the ITQ was developed whereby each symptom cluster was measured by two items (Cloitre et al., 2018). Additionally, the ITQ screens for a respondent's index trauma event, how long ago, the event occurred, and evidence of functional impairment associated with the PTSD and DSO symptoms. An adapted version of the ITQ has been developed for use in children and adolescents (ITQ-CA; Cloitre et al., 2018), with research demonstrating support for the psychometric properties of this measure (e.g. Bruckmann et al., 2020; Haselgruber et al., 2020b; Kazlauskas et al., 2020; Sölva et al., 2020). The ITQ has been validated and translated for use in twenty-five languages (International Trauma Consortium, n.d.) including Arabic (Vallières et al., 2018), Chinese (Ho et al., 2019) and Lithuanian (Kazlauskas et al., 2018). Given that the ICD-11 is the classification system used worldwide to described mental health disorders, that the ITQ is the only available self-report measure specifically designed to measure these diagnoses, and that the ITQ is frequently used in both clinical services and epidemiological research, summarising existing evidence on the validity of ITQ as a measure of ICD-11 PTSD and CPTSD is an important research endeavour.

Establishing the validity of the ITQ is a critical element in the larger, on-going process of evaluating the validity of the ICD-11's new descriptions of PTSD and CPTSD. Much of the existing literature has focused on testing the validity of the ITQ as a measure of PTSD and CPTSD by means of two analytical procedures: confirmatory factor analysis (CFA) and latent class/ profile analysis (LCA/LPA). Factor analysis is a statistical technique whereby continuous latent variables (i.e. factors) are used to explain the common content of

observed variables (Lubke & Muthén, 2005), and thus tests if responses to the ITQ can be explained by a set of continuous latent variables described in the WHO's model of PTSD and CPTSD (i.e., PTSD and DSO symptoms). On the other hand, mixture models utilise categorical latent variables to assign individuals into homogeneous groups, or latent classes, based on their responses to observed categorical (LCA) or continuous (LPA) symptom indicators (Nylund et al., 2007). Therefore, mixture models are used to test if responses to the ITQ can be explained by a categorical latent variable (i.e., belonging to a PTSD or CPTSD class). These methodological approaches test the factorial and discriminant validity of the ITQ, respectively.

Given that the ITQ was developed with the intention to enhance understanding of the *"…nature, predictors, course, treatment and outcomes of PTSD and CPTSD"* (Cloitre et al., 2018, p17), it is imperative to synthesise the extant evidence base regarding the validity of this measure. Brewin et al. (2017) provided a comprehensive review of the validity and applicability of ICD-11 PTSD and CPTSD symptom proposals, however, given that research has evolved since then and with the release of the 12-item ITQ in 2018, there is a need for an updated synthesis of research investigating the latent structure of the ITQ. Furthermore, there is a plethora of factor analytic studies investigating the latent structure of PTSD, as per DSM definitions, with a systematic literature review by Armour et al. (2016) highlighting the various factor analytic models identified within the DSM literature. Given that the ICD-11 description of PTSD is markedly narrower to that of DSM-IV and DSM-5 (Maercker et al., 2013) and with the inclusion of the new diagnosis of CPTSD in ICD-11, it is imperative to summarize findings from research investigating the latent structure of ICD-11 PTSD and CPTSD in a similar manner to what has been done for DSM. Therefore, the goal of this systematic review was to collate and synthesise all studies conducted to date on the latent structure of the ITQ using CFA and LCA/ LPA approaches. We aimed to address two

questions: (1) what is the optimal factor structure of the ITQ, and (2) how many classes best represent responses to the ITQ? In addition, we intended to investigate variation in these findings in relation to age and other socio-demographic or clinical characteristics. Four electronic databases (PsycINFO, Web of Science, Scopus and Pubmed) were searched using a series of search terms created to reflect the study aims. This study was conducted in adherence with Preferred Reporting items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2009) and the quality of each individual study was assessed using a novel quality assessment tool created for studies employing factor analytic and mixture modelling methodologies.

Methods

Protocol and Registration

A protocol for this systematic review was registered on Prospero (12/10/2020: CRD42020214070) and the study was conducted in adherence to the PRISMA guidelines (Moher et al., 2009).

Search strategy and study selection

One reviewer (ER) searched the online databases Web of Science, PsycINFO, Scopus and PubMed for all peer-reviewed studies investigating the latent structure of the ITQ. Search terms used are as follows: “PTSD” OR “Posttrauma*” OR “Post-trauma*” OR “Trauma” OR “Complex PTSD” OR “CPTSD” OR “Combat” OR “Stress Disorder*” OR “Psychological Trauma” OR “acute stress” and “International Trauma Questionnaire” OR “ITQ” and “factor analysis” OR “confirmatory factor analysis” OR “CFA” OR “factor*” OR “factor structure” OR “factor model*” or “mixture model*” or “Latent Class” or “Latent Profile”. The search limiters applied were language (English only)[i] and year of publication (studies published between 2010 and 2020). Searches were completed on 13/10/2020. An additional search was

conducted on 15/02/2021 to identify any relevant studies published since the initial searches in October 2020.

Eligibility Criteria

The criteria for inclusion were (1) peer-reviewed studies which investigated the latent structure of ICD-11 PTSD and CPTSD through factor analytic and mixture modelling methodologies, and (2) studies which assessed the latent structure using the ITQ. Studies including clinical and community samples were eligible for inclusion with no age restrictions stipulated. Exclusion criteria included studies which utilized qualitative methodology and studies which employed non-latent variable models such as network analysis.

Study selection/ Data Extraction

After completing manual searches on all four databases, results were exported to Mendeley reference management software. Initial searches retrieved a total of 277 articles. Duplicates (n =129) were removed which resulted in a total of 148 studies. Two reviewers (ER, EN) independently assessed the title, abstract and keywords of the 148 studies. Both reviewers exchanged their findings and any discrepancies identified were discussed with the assistance of a third reviewer (MS). Both reviewers then independently (ER, EN) screened full text articles for potentially relevant publications in accordance with the pre-established inclusion and exclusion criteria. Reference lists of these studies were inspected to identify any further studies suitable for inclusion. Data were extracted from the studies by both reviewers (ER, EN) independently. Extracted data included (1) author(s) and year of publication, (2) sample size, (3) population addressed, (4) study location (country), (5) mean age and standard deviation of the participants (range if available), (6) gender breakdown (percentage of females), (7) version of ITQ scale used, (8) statistical methodology, (9) number and types of factor structures analysed, (10) optimal factor structure(s) identified, (11) number of latent groups analysed, (12) optimal latent class structure, and (13)

limitations. The additional search conducted in February 2021 retrieved a total of thirty-six non-duplicated studies which were not assessed in the original search.

Main Outcomes

The main outcomes of interest were the differences in optimal factor structures and latent classes found by studies in relation to age, sample type (e.g. clinical and general population), country of origin of study sample as well as statistical methodologies.

Risk of bias

Title and abstract screening, full-text screening and data extraction was completed by two reviewers (ER, EN) independently to minimise risk of bias. Results were compared and any differences were discussed. The Kappa statistic (Cohen, 1960) was employed to assess inter-rater reliability. There was almost perfect agreement between reviewers (k = 0.96) following title and abstract screening and perfect agreement following full-text screening (k = 1.0). There was perfect agreement between reviewers (k = 1) with regards to the studies selected from the additional search.

A bespoke quality assessment checklist based on the original (van der Schoot et al., 2017) and adapted version of the GRoLTS-Checklist (Peterson et al., 2019), was devised for this study. The GRoLTS-Checklist proposes criteria that should be included when reporting results of latent trajectory studies (van der Schoot et al., 2017). The adapted checklist (see Appendix A2) was designed to be used for CFA or LCA/LPA studies. The checklist comprised sixteen items which included 'essential' and 'desirable' elements, and each item was scored as 'yes' (criteria met), 'partially' (criteria partially met) or 'no' (criteria not met).

Figure A about here

Results

Screening Results

Database searches retrieved a total of 148 non-duplicated publications, of which 112 were excluded following title and abstract screening. Full-text screening of the remaining 36 studies resulted in the exclusion of a further 10 ineligible studies. The PRISMA flowchart provides details the reasons for exclusion. An additional six studies were identified as suitable following title and abstract screening of articles yielded from the additional search conducted in February 2021. ln total, 32 studies were deemed eligible for inclusion in the systematic review.

Study characteristics

Details and characteristics of the included studies are provided in Table 1. Studies were from various locations including the United Kingdom (n=7), Israel (n=4), East Asia (China, Taiwan, Tokyo, Hong-Kong; n=3), Africa (n=3), as well as other geographic locations (n=10). In terms of design, all studies were cross-sectional. Studies were conducted on both child (n=3) and adult (n=29) samples. Studies included clinical samples (n=10), community samples (n=21), and one study was based on both samples. Mean age of participants ranged from 14.25 years (Kazlauskas et al., 2020) to 67.08 years (Choi et al., 2020). Gender ratios varied ranging from 1.1% female (Mordeno et al., 2019) to 84.7% female (Sele et al., 2020). Sample sizes ranged from 110 participants to 2524 participants. Various statistical methodologies were employed including CFA (n=17), LCA/LPA (n=7), both CFA and LCA (n=6), exploratory factor analysis (n=1) and exploratory structural equation modelling (n=1). Five studies investigated the latent structure of ICD-11 PTSD and CPTSD in conjunction with other psychopathologies occurring following trauma exposure including adjustment disorder (n=1), borderline personality disorder (n=3) and psychosis

(n=1). Different variations of the ITQ were used including the preliminary version (n=11) , the final version (n=17), both (n=1) whilst two studies utilised the newly developed ITQ-CA. The majority of studies used translated versions of the scale (n=22) whilst the remainder used the English version (n=10).

Quality Assessment

Most studies (n=31; 96.9%) met all, or most, of the essential quality assessment criteria. A detailed breakdown of the quality of each study is provided in Appendices B.1 and B.2. In terms of the studies that analysed the latent structure of the ITQ, 20 studies (80%) failed to report on missing data mechanisms (i.e. missing completely at random, missing at random or not missing at random), whilst fifteen studies (60%) failed to report on how missing data was dealt with in the analysis. Of the twelve studies which employed LCA/LPA, missing data mechanisms were not reported in all eleven studies (91.7%), nine failed to report on how missing data was dealt with (75%), no study reported on parameter restrictions (100%), whilst three studies (25%) did not report entropy values (a measure of the quality of latent class classification). One study failed to meet the essential criteria listed for factor analytic studies (Rocha et al., 2020).

Factor Structure Review

Nine studies found that the two-factor second-order model was the best fit of the ITQ data. This structure, reflective of the ICD-11 description of CPTSD, was supported in diverse clinical samples including a sample of male perpetrators of domestic violence (Gilbar et al., 2018), a treatment-seeking sample of Syrian refugees (Hyland et al., 2018) and treatment-seeking adults in the UK (Hyland et al., 2017) and Lithuania (Kazlauskas et al., 2018). Five studies comprising community samples also identified this model as the best fit to their sample data (Choi et al., 2020; Haselgruber et al., 2020a; Haselgruber et al., 2020b;

Owczarek et al., 2020; Somma et al., 2019). The correlated six-factor model was also reported as demonstrating good fit in each of these samples.

The correlated six-factor first-order model was identified as the best fitting model in five community studies (Choi et al., 2021; Ho et al., 2020; Ho et al., 2019; Kazlauskas et al., 2020; Mordeno et al., 2019). This model was favoured in an overall sample of young adults from East Asia (Ho et al., 2020), a sample of Chinese young adults of which almost three quarters reported at least one ACE (Ho et al., 2019), in a sample of combat exposed soldiers from the Philippines (Mordeno et al., 2019), in a sample of South Korean adults (Choi et al., 2021) and in a sample of children and adolescents using the ITQ-CA (Kazluaskas et al., 2020). Notably, the two-factor second-order model was also a good fit to the data in all of these community studies.

Two studies (Cloitre et al., 2020; Shevlin et al., 2020) which used the preliminary version of the ITQ identified both models as being of equivocal fit. Shevlin et al (2020) investigated the fit of both models in a nationally representative sample of adults living in the US using randomly generated combinations of symptom items constituting the DSO dimension, in order to assess performance of DSO indicators. Both models containing any two randomly generated indicators from each DSO cluster produced excellent model fit. Cloitre et al. (2020) found both models to be comparable in terms of model fit in their community and clinical sample. Ho et al. (2020) investigated the validity of ICD-11 PTSD and CPTSD in East Asian cultures. In addition to investigating the sample as a whole, four separate analyses were conducted on participants in Hong Kong, China, Taiwan, and Japan. The correlated six-factor model was deemed the best fitting model in Hong-Kong, the two factor second-order model demonstrated better fit in the Taiwan sample whereas both models demonstrated adequate fit in China and Japan.

Figure B.1 & Figure B.2 about here.

When separating the AD dimension into hypo- and hyper-activation, Ben-Ezra et al. (2018) found a seven factor first-order correlated model to have the best fit in a nationally representative sample of adults in Israel. The second-order model also showed adequate fit; however, the BIC value was lowest for the non-hierarchical model. The two-factor second-order model with the affective dysregulation factor split into two separate dimensions of 'Hyperactivation' and 'Hypoactivation' was deemed the best fitting model in a treatment seeking sample of Syrian refugees (Vallières et al., 2018) and in a pre-dominantly female (84.7%) trauma exposed Norwegian clinical sample (Sele et al., 2020). Two community studies found the seven-factor first-order correlated model and the two-factor second-order model with the affective dysregylation factor split into two separate dimensions to be of comparable fit (Karatzias et al., 2018, Murphy et al., 2018). Murphy et al. (2018) also reported a single second order model with seven first order factors, with AD treated as two separate factors, as demonstrating acceptable fit.

Five studies investigated alternative factor models (Frost et al., 2020; Hansen et al., 2017; Hyland et al., 2019; Karatzias et al., 2020; Rocha et al., 2020). Hansen et al. (2017) demonstrated support for a three-factor model of ICD-11 PTSD (Re, Av, Th) in three trauma exposed Danish samples. Rocha et al. (2020) identified five factor groups (NSC, PTSD symptom, AD, emotional numbing, and impulsivity control) which explained 61.58% of scale variance using exploratory factor analysis. Karatzias et al (2020) investigated the latent structure of ICD-11 PTSD and CPTSD in conjunction with ICD-11 Adjustment Disorder (AdJ) in a sample of treatment seeking adults in Scotland. Results demonstrated a three factor second-order model (PTSD, DSO, AdJ) with eight first order factors (preoccupation (AdJ), failure to adapt (AdJ), Re, Av, Th, NSC, DR, AD) to be

most fitting in terms of model fit and parsimony. Hyland et al. (2019) employed exploratory structural equation modelling to examine the discriminant validity of ICD-11 CPTSD and Borderline Personality Disorder (BPD) in a UK trauma exposed population sample. A three-factor model comprising of a PTSD, DSO and a BPD latent variable was found to be the best fit to the data, with the six items reflecting PTSD and the items reflecting DSO loading strongly and significantly onto their respective factors. In terms of cross-factor loadings, four PTSD and nine BPD items loaded significantly yet for the most part weakly onto the DSO latent factor whilst four DSO items and one BPD symptom cluster loaded significantly albeit weakly onto the PTSD factor. Finally, Frost et al. (2020) identified a bifactor model comprising of three correlated factors reflecting PTSD, DSO and BPD and one general factor to be the best-fitting model.

Mixture Models Review

All twelve LCA/LPA studies identified the presence of a 'PTSD class', characterised by high endorsement of PTSD symptoms, and a 'CPTSD class', characterized by high endorsement of PTSD and DSO symptoms. A range of latent class solutions were identified, with the number of latent classes varying as a result of the inclusion of other variables (e.g. BPD) and the population addressed.

A two-class solution comprising of 'CPTSD class' containing 87% of the sample, and 'PTSD class' comprising 13% of the sample, was deemed best fit in a treatment seeking sample of refugees (Vang et al., 2019). The entropy value was highest for a three-class solution however the BIC value (a measure of relative fit) favoured a two-class solution, leading to the selection of the two-class solution. In their investigation of the associations between moral injury and ICD-11 CPTSD, Currier et al. (2021) identified a two-profile solution comprising of a 'high distress group' (80.3%) characterized by high scores on moral

injury, PTSD and DSO indicators and a 'low distress group' (19.7%) characterised by low scores on all indicators.

Five studies identified a three-class solution comprising a 'PTSD class', a 'CPTSD class' and a 'low symptom class' as the best fit to their data (Haselgruber et al., 2020; Hyland et al., 2018; Jowett et al., 2020; Karatzias et al., 2018; Kazlauskas et al., 2018). Two studies analysing data collected from clinical samples (Hyland et al., 2018, Kazlauskas et al., 2018) demonstrated support for this solution. Differences emerged in terms of class composition, with Kazlauskas et al., (2018) identifying the 'CPTSD class' as the largest group in their sample comprising 80.2% females whereas Hyland et al (2018) identified the the PTSD and low symptom classes as the largest latent groups in their predominantly male (77.5%) sample. Two community studies also supported this class solution (Haselgruber et al., 2020, Karatzias et al., 2018). Compared to Karatzias et al. (2018), Haselgruber et al. (2020) identified a larger PTSD class (31.6% v 29.6%), CPTSD class (22.8% v 9.4%) and a smaller low symptom class (45.6% v 61%). Jowett et al. (2020) examined the discriminating symptom profiles of ICD-11 PTSD, CPTSD and BPD using LCA. Three latent classes were identified: a CPTSD/High BPD class containing 43.1% of the sample, a CPTSD/moderate BPD class (40% of sample) and a PTSD/low BPD class (16.9% of sample).

Four general population studies identified a four-class model comprising a 'CPTSD class', a 'PTSD class', a 'low symptoms class' as well as a 'DSO only class' (Ben-Ezra et al., 2018; Kazlauskas et al., 2020; Rink & Lipinksa, 2020; Tian et al., 2020). The PTSD class was largest in the Rink and Lipinksa. (2020) study and the CPTSD class was largest (34.1%) in the Kazlauskas et al. (2020) study, which investigated the latent structure of ICD-11 PTSD and CPTSD in children and adolescents. Conversely, the low symptom class was identified as being largest class in the remaining studies.

Frost et al. (2019) investigated the latent structure of PTSD, CPTSD and psychosis symptoms using mixture modelling methodologies in a trauma exposed UK general population. Six classes were identified: a 'CPTSD class'(19%), a 'low symptom' class (41.3%), a 'PTSD' class, a 'DSO' class, an 'intermediate comorbid' class characterized by moderate to high endorsement of PTSD and CPTSD symptoms and varying probabilities of endorsing psychosis symptoms(8.6%') and a comorbid class, characterized by high risks of endorsing PTSD, DSO and psychosis symptoms (3.4%). Choi et al. (2021) identified six classes in their general population sample: a 'CPTSD class' (19.5%), a 'DSO with sense of threat class' (7.4%), an 'emotion dysregulation class' (9.8%), a 'PTSD class' (20.6%), a 'DSO class' (8.9%) and a 'low symptoms class' (33.9%).

Discussion

This systematic review aimed to collate all studies conducted to date on the latent structure (using factor analytic and mixture modelling methodologies) of PTSD and CPTSD using the International Trauma Questionnaire. This review addressed two questions: (1) what factor structure of the ITQ best represents the dimensionality of PTSD and CPTSD scores? , and (2) what are the most common classes that represent the symptom profiles of both disorders across various samples? Thirty-two studies met the inclusion criteria for this systematic review. The results presented in this review provide a comprehensive understanding of the most favourable symptom structure and symptom profiles of PTSD and CPTSD identified across various sample types and conducted across a wide range of countries and cultural contexts.

In line with previous evidence (Brewin et al., 2017; Hyland et al.,2017; Shevlin et al., 2017), the two-factor second-order model was consistently deemed the optimal model in clinical studies. Most community studies identified the correlated six-factor first-order model as the best structural representation of PTSD and CPTSD. Both models support the ability of

the ITQ, in its' preliminary and final form, to effectively distinguish between PTSD and CPTSD at different levels of symptom severity i.e. clinical versus general population samples. Prevalence rates of PTSD and CPTSD are generally substantially lower in community samples (Brewin et al., 2017), which may explain why the delineation between PTSD and CPTSD is not so clear-cut in these samples. Factors such as trauma type, availability of resources, and individual coping mechanisms have been purported to differentially effect the severity of each individual symptom cluster (Mordeno et al., 2019). High levels of exposure to interpersonal trauma have been shown to be highest in those meeting diagnostic criteria for CPTSD, with this effect being strongest in clinical samples (Cloitre et al., 2018). Furthermore, it has been suggested that the inter-relations amongst factors reflecting PTSD and CPTSD may differ in children and adolescents, owing to the rapid biological, psychological and social changes characteristic of these developmental periods (Kazlauskas et al., 2020). Overall, it appears that PTSD and CPTSD form more cohesive constructs in samples marked by high levels of symptom burden and trauma exposure. Notably, differences between both models were minimal in most studies, supporting the idea that although the hierarchical model is conceptually useful, it may not always be necessary (Hyland et al., 2017).

The separation of AD into two independent, yet related factors, was found to improve model fit ,when tested in conjunction with models treating AD as a unitary construct, consisted with findings from network analysis studies (Knefel et al., 2019; McElroy et al., 2019). Results from studies investigating the discriminant validity of PTSD and CPTSD with adjustment disorder (Karatzias et al., 2020) and BPD (Hyland et al., 2019), demonstrated that although there were moderate to strong correlations amongst the factors at the dimensional level, that each latent factor could be distinguished by exogenous and endogenous variables that were unique to each factor. Likewise, Frost et al. (2020) reported a bifactor model

consisting of the three correlated factors of PTSD, DSO and BPD and one general factor to be the best-fitting model, again demonstrating that CPTSD and BPD represent distinct albeit correlated constructs.

In accordance with previous research (Brewin et al., 2017), all twelve LCA studies identified the presence of both a 'PTSD class' and a 'CPTSD class', with the majority of clinical studies also identifying a class marked by low endorsement of both PTSD and DSO symptoms. Consistent with past studies (Knefel et al., 2018; Liddell et al., 2019; Perkonigg et al., 2016), an additional 'DSO class' emerged in community samples. The identification of this 'DSO' class in community samples may again reflect the lower rates of trauma exposure. Although considered a community study, Haselgruber et al. (2020a) failed to identify this additional symptom profile, which may be indicative of the high levels of interpersonal trauma exposure and poly-traumatisation reported by this sample. This discrepancy might be due to phenomenological differences of PTSD and CPTSD between children and adults. Furthermore, research has demonstrated how foster children are at greater risk of maltreatment and abuse during their formative years compared to the general population (Sölva, Haselgruber & Lueger-Schuster, 2020); thus it is not surprising that symptom profiles identified in that study reflected those usually found in treatment-seeking participants. Conversely, the identification of this additional class in general population samples may be related to sample size, whereby larger samples tend to generate solutions with larger numbers of classes (Perkonigg et al., 2016).

Because the pervasive disturbances in individual functioning which characterize DSO can be considered as "*cross-diagnostic phenomena"* (Ben-Ezra et al., 2020, p. 271), it is possible that the DSO group may represent individuals with other forms of psychopathologies. Indeed, a recent network analysis study demonstrated a strong connection between the symptoms constituting DSO and both depression and anxiety symptoms (Gilbar.,

2020), indicating symptom overlap across disorders. Kazlauskas et al (2020) reported that the 'sudden death of a loved one' was a predictor of the 'DSO class', suggesting the potential causal role of trauma type in disruptions to the domains of affect, self and interpersonal relationships in the absence of PTSD symptoms. Further research is necessary to decipher the differential predictors of this 'DSO class', especially in comparison to a CPTSD class (Cloitre et al., 2020). The emergence of both 'PTSD' and 'CPTSD' classes in studies investigating both disorders in samples which include individuals with BPD (Jowett et al., 2020) and psychosis symptoms (Frost et al., 2019), further reinforces the conceptualisation of both factors as possessing their own unique symptom profile.

Findings from this review should be considered in light of several limitations. Although latent class solutions were similar across studies, the composition of the latent class solutions were largely heterogenous. Factors influencing latent class analysis include sample size, fit indices used, missing data patterns, as well as number of indicators included (Swanson et al., 2011), and therefore the direct comparison of class compositions fell outside the scope of this review. We did not seek to synthesise information on differential predictors of latent structures of PTSD and CPTSD, which may be an interesting avenue for future systematic reviews. Finally, all analyses were based on self-report data based on the ITQ which might have introduced bias to the findings. It would be useful to conduct similar analysis in the future on the latent structure of PTSD and CPTSD comparing findings form the ITQ and the International Trauma Interview (ITI) (Roberts et al., 2018), a clinician led interview schedule for the assessment of PTSD and CPTSD, which is under development.

Researchers and clinicians may wish to consider the findings of this review, especially in terms of differences between clinical and general population samples, when choosing which ITQ scoring algorithm to employ. The ITQ provides both dimensional scoring, where a total PTSD and DSO score can be calculated with higher scores indicative

of greater symptom severity and diagnostic scoring, which indicates the presence or absence of both disorders based on pre-established cut-off criteria (Likert score ≥2 = symptom endorsement). Both approaches have their strengths and limitations (e.g. Ruscio & Ruscio, 2008) and researchers and clinicians should consider their goals when determining which algorithm to apply. Somma et al. (2019) reported lower internal reliability estimates for items scored dichotomously (diagnostic) compared to dimensional scores in their non-clinical sample. In general population studies, where the goal is often to capture the range of symptom severity across symptom clusters rather than identifying PTSD/CPTSD cases, dimensional scoring may be most appropriate.

Further research is required to investigate the latent structure of PTSD and CPTSD in populations with high levels of trauma exposure such as children and adolescents. An improved conceptualisation and measurement of trauma-related disorders in this cohort is a pressing issue (Olff et al., 2017), and future research should seek to validate these constructs using the ITQ-CA, a measure of PTSD and CPTSD symptoms specifically designed for use with individuals aged 7 to 17 years (Cloitre et al., 2018). All studies included in this review employed either CFA and/or LCA, with the former assuming a dimensional approach to psychopathology and the latter assuming a categorical approach (Clarke et al., 2013). However, there are caveats to both approaches. LCA does not directly consider the varying degrees of severity and impairment within and across diagnostic classes. Conversely, with CFA, it is difficult to classify individuals into groups, which is a clinical necessity for diagnostic entities (Clarke et al., 2013). Thus, Lubke and Muthén (2005) advocated for the factor mixture model (FMM) which allows the underlying structure of PTSD and CPTSD to be assessed simultaneously at both a categorical and dimensional level. This can be considered a more robust latent structure modelling technique which future research could seek to employ.

In conclusion, this review sought to provide a rigorous and comprehensive synthesis of the growing body of literature investigating the latent structure of PTSD and CPTSD using the ITQ. Overall, research conducted to date, through factor analytic and mixture modelling methodologies, have demonstrated support for the conceptual coherence of both constructs as empirically distinguishable disorders that can be applied across various countries and cultural contexts. Existing research, which generally met all or most of the essential quality criteria, suggests that the ITQ is a valid tool for the assessment of ICD-11 PTSD and CPTSD in clinical practice. The findings of this systematic review highlight the optimal structural representations and symptom profiles of both constructs across diverse samples as well as consistent themes which emerged for both clinical and population based studies.

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Table A. A Summary of the Design and Main Results for Each Study Included in the Review.

Study	Country	Sample	Sample Size	Mean age	% Female	ITQ	# CFA models	Results	N LCA Models	Results
Ben-Ezra et al (2018)	Israel	Nationally representative community.	1003	40.6 (SD=14.5)	51.7	Preliminary Hebrew	6	Correlated first-order seven factor model with AD as 2 factors.	6	4 class solution
Gilbar et al (2018)	Israel	Clinical	234			Preliminary Hebrew	7	Two factor second-order model.	n/a	n/a
Hansen et al (2017)	Denmark	3 trauma exposed samples.	1.University Students (N=4213) 2.Chronic pain patients (N=573) 3.Military Personnel (N= 118)	1. 24.92 SD=5.36) Range:18-74 2.48.60 (SD=14.86) Range:19-92 3. 35.85 (SD=10.28)	1. 64.9 2. 35.6 3. 8.5	ITQ-6 PTSD items only.	3	3 factor model	n/a	n/a
Owczarek et al (2019)	Africa	Community	2524	30.75 (SD= 8.93)	49.6	Final version translated	4	Two factor second-order model.	n/a	n/a
Vallieres et al (2018)	Lebanon	Treatment seeking refugees.	112	33.02 (SD= 8.94) Range: 18-60	80	Preliminary-Arabic	6	Two factor second-order model with AD split into two dimensions.	n/a	n/a
Haselgruber, Solva & Lueger-Schuster (2020)	Austria	Foster Care	136	14.28 (SD= 2.25) Range: 10-18	42.6	Final version	7	Two factor second-order model.	5	3 class model
Cloitre et al., (2018)	UK	Clinical Community	247 1051	42.07 (SD=12.96)	68 68.4	Final version	2	Two factor second-order model and	n/a	n/a

				47.18 (SD= 15)				correlated six factor model.		
Murphy Elklit, Dokkedahl & Shevlin (2018)	Uganda	Community	314	22.30 (SD=2.84) Range: 18-25	51	Preliminary version- translated to Awach	7	Correlated first order seven factor model.	n/a	n/a
Sele et al., (2020)	Norway	Clinical	202	41.5 (9.5) Range: 24-69	84.7	Preliminary and final version used in study 1. Norwegian translation	2	Two factor second-order model with AD divided into hypo- and hyper-activation. 12 item CFA model did not converge.	n/a	n/a
Kazlauskas et al (2018)	Lithuania	Clinical	280	39.48 (SD= 13.35).	77.5	Preliminary version.	3	Two factor second-order model.	5	3 class solution.
Hyland et al (2017)	UK	Clinical	171	49.85 (SD=12.73) Range: 18-78	48.5	Preliminary version.	7	Two factor second-order model.	n/a	n/a
Jowett et al (2020)	Scotland	Clinical	195	41 9 (SD=12.4)	65.1	Preliminary version.	n/a	n/a	6	3 class solution.
Mordeno, Nalipay & Mordeno (2019)	Philippines	Community sample of soldiers in the armed forces	450	30.11 (SD= 7.47)	1.1	Preliminary version- Filipino translation	7	Correlated six-factor model.	n/a	n/a
Karatzias et al (2020)	Scotland	Clinical	331	39 (SD=12.46)	62.1	Final version ITQ.	5	Two factor second-order with 8 first-order factors.	n/a	n/a
Ho et al (2020)	East Asia	Community	1346 total.	20 (SD=1.55) Range:18-24	67.9	Final version- Chinese	2	Correlated six factor first-order model.	n/a	n/a

Ho et al (2019)	China	Community	314	20.17 (SD=1.66)	58.6	Final version Chinese ITQ	4	Six factor first-order model.	n/a	n/a
Hyland et al (2018)	Lebanon	Clinical sample of Syrian refugees	110	33.02 (SD=8.94)	80.2	Preliminary version-Arabic	n/a	n/a	6	3 class solution
Karatzias et al (2018)	Israel	Community	618	33.39 (SD=11.95)	78	Preliminary version-Hebrew.	4	Correlated seven factor first-order model and two factor second-order model with AD split into 2 factors.	6	3 class solution
Kazlauskas et al (2020)	Lithuania	Community sample of adolescents	932	14.25 (SD=1.27)	56.8	ITQ-CA Lithuanian translation	4	Correlated six factor model.	5	4 class solution.
Somma et al (2019)	Italy	Community	748	35.50 (SD= 13.85)	49.7	Preliminary Italian translation.	4	Two factor second-order model in both trauma exposed and non-trauma exposed participants.	n/a	n/a
Tian et al (2020)	China	Community	1760	19.71 (SD=2.48)	66.1	Final version-Chinese translation.	n/a	n/a	5	4 class solution.
Vang et al (2019)	Denmark	Treatment seeking refugees.	284	40.94 (SD= 9.77) Range: 17-68	47.5	Final version translated to Arabic, Danish & Bosnian.	n/a	n/a	6	2 class solution.
Frost et al (2019)	UK	Trauma exposed general population.	1051	47.18 (SD= 15.00) Range: 18-90	68.4	Final version	n/a	n/a	8	6 class solution.

Shevlin et al (2018)	USA	Nationally representative community sample.	1839	No mean age provided. Range: 18-70	52	Final version	2	Correlated six factor model & two factor second-order model.	n/a	n/a
Hyland et al (2019)	UK	Trauma exposed population sample.	546	47.21 (SD=14.94) Range: 18-83	69	Final version	ESEM 1 -6 latent factors.	3 latent factors.	n/a	n/a
Rocha et al (2020)	Portugal/ Angola	Community samples.	268	Portugal: 30.25(SD=12.54) Range:17-69	60.9%	Portuguese version.	EFA.	5 factors.	n/a	n/a
				Angolan sample: 36.85 (11.7) Range: 18-70	32.9%					
Frost, Murphy et al (2019)	Israel	General population.	618	33.41 (SD=11.95) Range: 18-80	78%	Final ITQ Hebrew Version	3	Bifactor model including one 'general' factor and three correlated factors of PTSD, DSO & BPD.	n/a	n/a
Choi et al (2021)	South Korea	General population.	800	40.74 (SD=10.92) Range: 20-59	48.75%	Final ITQ Korean translation.	3	Correlated six-factor	6	6-class solution.
Choi et al (2020)	South Korea	General population: organized violence survivors of past political oppression in South Korea.	236	67.08 (SD=10.93) Range: 38-92	19.5%	Final version ITQ Korean Version.	3	Two-factor second-order	n/a	n/a

Haselgruber et al (2020b)	Austria	Foster children.	135	14.26 (SD=2.34)	31.1%	ITQ-CA. German translation.	4.	Two-factor second-order	n/a	n/a
Rink & Lipinksa (2020)	South Africa	Community sample (undergraduate students)	576	20.46 (SD=2.76)	84.55%	Final ITQ.	n/a	n/a	5	4 class solution.
Currier et al (2021)	UK	Treatment-seeking veterans.	173	52.64 (SD=11.34)	5%	Final ITQ.	n/a	n/a	4	2 class solution.

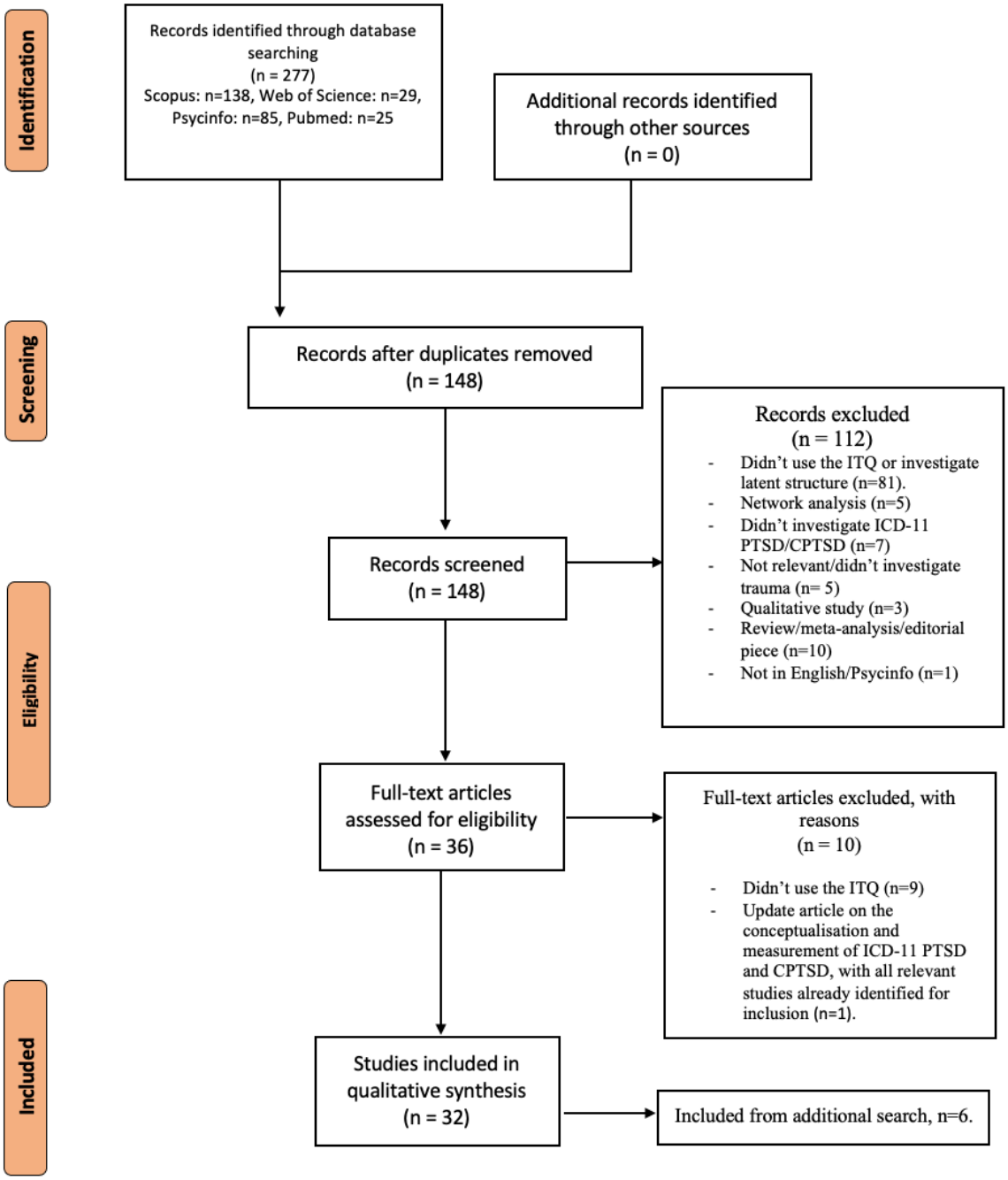

Figure A. Prisma Flow Diagram.

Figure A: Prisma Flow Diagram.

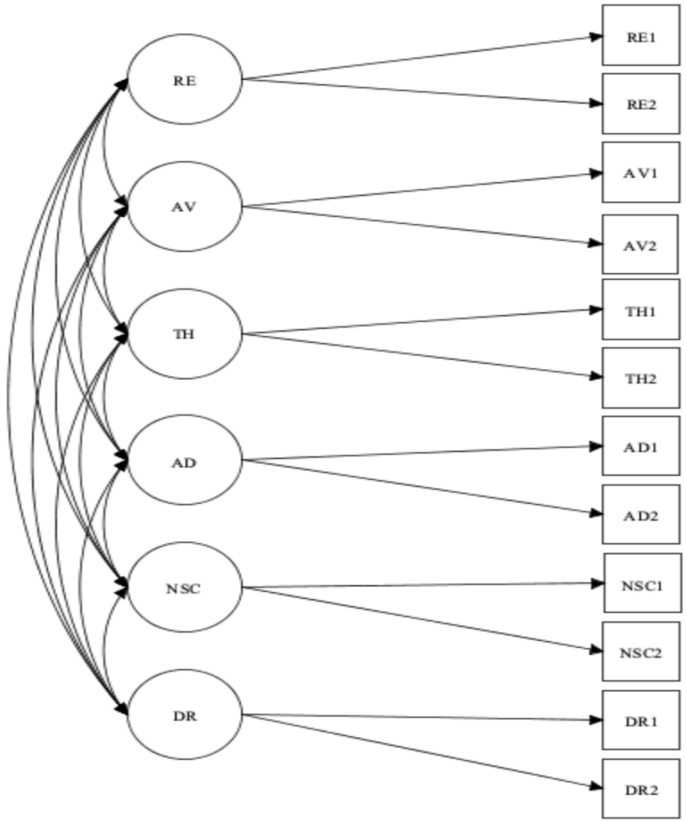

Figure B.1. Correlated Six-Factor Model of final ITQ including re-experiencing (RE), avoidance (AV), threat (TH), affective dysregulation (AD), negative self-concept (NSC) and disturbances in relationships (DR).

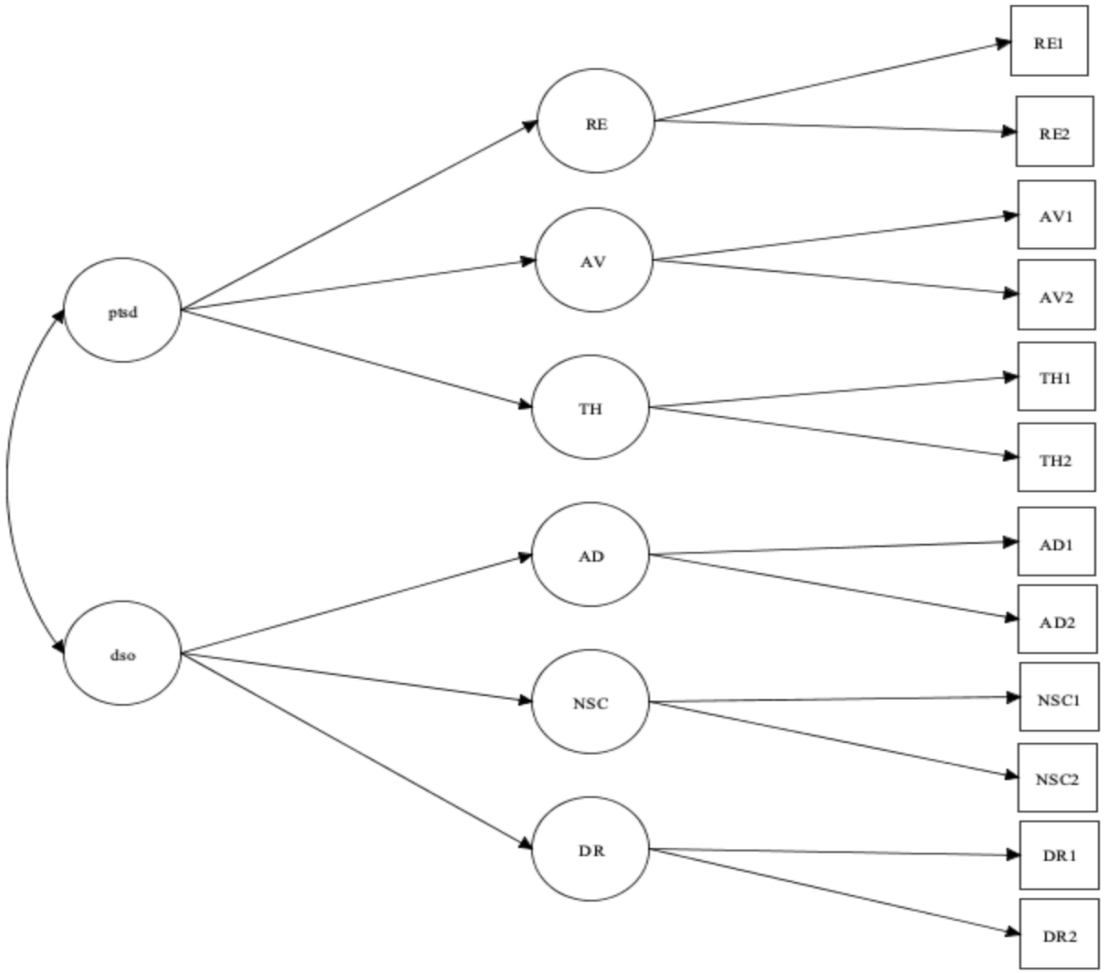

Figure B.2: Two-factor Second-Order Model of final ITQ including two second-order latent factors of PTSD, explaining covaration between re-experiencing (RE), avoidance (AV) and perceived threat (TH) and DSO, explaining covariation between affective dysregulation (AD), negative self-concept (NSC) and relationship disturbances (DR).

Appendix A: Studies Excluded from Systematic Review.

Author	Reason for Exclusion
Alghamdi, M. (2020).	Doesn't use the ITQ.
Bachem, R., Baumann, J., & Köllner, V. (2019).	Doesn't investigate ICD-11 PTSD/CPTSD- not adjustment disorder.
Barani, F. (2019)	Doesn't use the ITQ/ doesn't investigate the latent structure of ICD-11 PTSD/CPTSD.
Ben-Ezra, M., Hyland, P., Karatzias, T., Maercker, A., Hamama-Raz, Y., Lavenda, O., . . . Shevlin, M. (2020).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD.
Ben-Ezra, M., Mahat-Shamir, M., Lorenz, L., Lavenda, O., & Maercker, A. (2018).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD.
Bisson, J. I., Berliner, L., Cloitre, M., Forbes, D., Jensen, T. K., Lewis, C., . . . Shapiro, F. (2019).	Systematic review.
Bondjers, K., Hyland, P., Roberts, N. P., Bisson, J. I., Willebrand, M., & Arnberg, F. K. (2019).	Doesn't use the ITQ.
Brenner, L., Köllner, V., & Bachem, R. (2019).	Doesn't use the ITQ.
Brewin, C. R. (2020).	Review.
Brewin, C. R., Cloitre, M., Hyland, P., Shevlin, M., Maercker, A., Bryant, R. A., . . . Reed, G. M. (2017).	Doesn't use the ITQ.
Briere, J., Runtz, M., Rassart, C. A., Rodd, K., & Godbout, N. (2020).	Doesn't use the ITQ/ doesn't investigate the latent structure.
Bruckmann, P., Haselgruber, A., Sölva, K., & Lueger-Schuster, B. (2020).	Doesn't investigate the latent structure of the ITQ.
Bryant, R. A. (2019).	Review.
Bryant, R. A., Felmingham, K. L., Malhi, G., Andrew, E., & Korgaonkar, M. S. (2019).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD.
Carvajal, C. (2018).	Review.
Cloitre, M., Brewin, C. R., Bisson, J. I., Hyland, P., Karatzias, T., Lueger-Schuster, B., . . . Shevlin, M. (2020).	Response/letter to the editor.
Cloitre, M., Hyland, P., Bisson, J. I., Brewin, C. R., Roberts, N. P., Karatzias, T., & Shevlin, M. (2019).	Prevalence rates/ doesn't examine latent structure of ICD-11 PTSD/CPTSD.
de Jongh et al (2019).	Doesn't examine latent structure of ICD-11 PTSD/CPTSD.

Donat, J. C., Lobo, N. S., Jacobsen, G. S., Guimarães, E. R., Kristensen, C. H., Berger, W., . . . Nascimento, E. (2019).	Doesn't examine latent structure of ICD-11 PTSD/CPTSD-investigates scale validity.
Ehlers, A., Wild, J., Warnock-Parkes, E., Grey, N., Murray, H., Kerr, A., . . . Clark, D. M. (2020).	Doesn't use the ITQ or examine the latent structure of ICD-11 PTSD/CPTSD.
Ekawarna, & Kohar, F. (2019).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD.
Elliott, R., McKinnon, A., Dixon, C., Boyle, A., Murphy, F., Dahm, T., . . . Hitchcock, C. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD-investigates the prevalence of symptoms.
Ferretti, F., Gualtieri, G., Bossini, L., Olivola, M., Del Matto, L., Desantis, S., . . . Coluccia, A. (2020).	Doesn't use the ITQ and doesn't investigate the latent structure of ICD-11 PTSD/CPTSD.
Forstmeier, S., Van Der Hal, E., Auerbach, M., Maercker, A., & Brom, D. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD, doesn't use the ITQ.
Frewen, P., Zhu, J., & Lanius, R. (2019).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Garza-Gil, M. D., Amigo-Dobaño, L., Surís-Regueiro, J. C., & Varela-Lafuente, M. (2015).	Unrelated to trauma related disorders.
Gilbar, O., Dekel, R., Hyland, P., & Cloitre, M. (2019).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD.
Gilbar, O. (2020).	Network Analysis.
Gilbar, O., Taft, C., & Dekel, R. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD.
Gilbar, O., Wester, S. R., & BenPorat, A. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Glover, V., O'Donnell, K. J., O'Connor, T. G., & Fisher, J. (2018).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Glück, T. M., Knefel, M., & Lueger-Schuster, B. (2017).	Network Analysis.
Gražulytė, D., Kazlauskas, E., Norkienė, I., Kolevinskaitė, S., Kezytė, G., Urbanavičiūtė, I., . . . Šipylaitė, J. (2019).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Haahr-Pedersen, I., Perera, C., Hyland, P., Vallières, F., Murphy, D., Hansen, M., . . . Cloitre, M. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Haselgruber, A., Sölva, K., & Lueger-Schuster, B. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Haslam, N., McGrath, M. J., Viechtbauer, W., & Kuppens, P. (2020).	Doesn't use the ITQ.
Hecker, T., Huber, S., Maier, T., & Maercker, A. (2018).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Heeke, C., O'Donald, A., Stammel, N., & Böttche, M. (2020).	Doesn't use the ITQ.

Herzog, P., Voderholzer, U., Gartner, T., Osen, B., Svitak, M., Doerr, R., . . . Brakemeier, E. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Ho, G. W. K., Bressington, D., Karatzias, T., Chien, W. T., Inoue, S., Yang, P. J., . . . Hyland, P. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ – investigates ACEs rather than PTSD specifically.
Ho, G. W. K., Chan, A. C. Y., Shevlin, M., Karatzias, T., Chan, P. S., & Leung, D. (2019).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ- looking at ACEs rather than PTSD specifically.
Hodes, M., & Vostanis, P. (2019).	Practitioner review.
Holgersen, K. H., Brønstad, I., Jensen, M., Brattland, H., Reitan, S. K., Hassel, A. M., . . . Skjervold, A. E. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ- Randomized Control Trial of interventions.
Hyland, P., Karatzias, T., Shevlin, M., Cloitre, M., & Ben-Ezra, M. (2020).	Investigates temporal stability of ICD-11 PTSD/CPTSD.
Hyland, P., Murphy, J., Shevlin, M., Bentall, R. P., Karatzias, T., Ho, G. W. K., . . . Mcelroy, E. (2020).	Doesn't use the ITQ.
Hyland, P., Shevlin, M., Fyvie, C., Cloitre, M., & Karatzias, T. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD.
Hyland, P., Shevlin, M., Fyvie, C., & Karatzias, T. (2018).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Hyland, P., Vallières, F., Cloitre, M., Ben-Ezra, M., Karatzias, T., Olff, M., . . . Shevlin, M. (2020).	Doesn't use factor analytic or mixture modelling methodologies.
Hyland, P., Karatzias, T., Shevlin, M., McElroy, E., BenEzra, M., Cloitre, M., & Brewin, C. R. (2020).	Doesn't use factor analytic or mixture modelling methodologies.
Karatzias, T., Hyland, P., Bradley, A., Cloitre, M., Roberts, N. P., Bisson, J. I., & Shevlin, M. (2019).	Doesn't use factor analytic or mixture modelling methodologies.
Karatzias, T., Hyland, P., Bradley, A., Fyvie, C., Logan, K., Easton, P., . . . Shevlin, M. (2019).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ – investigates therapeutic intervention for ICD-11 PTSD/CPTSD.
Karatzias, T., & Levendosky, A. A. (2019).	Review.
Karatzias, T., Murphy, P., Cloitre, M., Bisson, J., Roberts, N., Shevlin, M., . . . Hutton, P. (2019).	Meta-analysis of therapeutic interventions.
Karatzias, T., Shevlin, M., Fyvie, C., Grandison, G., Garozi, M., Latham, E., . . . Hyland, P. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ- mediation analysis of the role of benevolent childhood experiences in PTSD/CPTSD.
Karatzias, T., Shevlin, M., Murphy, J., McBride, O., Ben-Ezra, M., Bentall, R. P., . . . Hyland, P. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.

Karatzias, T., Shevlin, M., Hyland, P., Fyvie, C., Grandison, G., & Ben-Ezra, M. (2020)	Doesn't use factor analytic or mixture modelling methodologies.
Katikiro, R. E., & Mahenge, J. J. (2016).	Unrelated to trauma.
Killikelly, C., Zhou, N., Merzhvynska, M., Stelzer, E. -., Dotschung, T., Rohner, S., . . . Maercker, A. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ- investigates the prolonged grief scale.
Killikelly, C., Lorenz, L., Bauer, S., MahatShamir, M., BenEzra, M., & Maercker, A. (2019).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ – investigating the prolonged grief scale.
Knefel, M., Karatzias, T., Ben-Ezra, M., Cloitre, M., Lueger-Schuster, B., & Maercker, A. (2019).	Network analysis.
Knefel, M., Lueger-Schuster, B., Karatzias, T., Shevlin, M., & Hyland, P. (2019).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD.
Letica-Crepulja, M., Stevanović, A., Protuđer, M., Grahovac Juretić, T., Rebić, J., & Frančišković, T. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Li, G., Wang, L., Cao, C., Fang, R., Chen, C., Qiao, X., . . . Elhai, J. D. (2020).	Doesn't use the ITQ.
Litvin, J. M., Kaminski, P. L., & Riggs, S. A. (2017).	Doesn't use the ITQ.
Liu, J., Lim, M. S. M., Ng, B. T., Chong, S. A., Subramaniam, M., & Mahendran, R. (2020).	Doesn't use the ITQ.
Lotfinia, S., Soorgi, Z., Mertens, Y., & Daniels, J. (2020).	Systematic review.
Lotzin, A., & Schafer, I. (2019).	German – psycinfo.
Louison Vang, M., Ali, S. A., Christiansen, D. M., Dokkedahl, S., & Elklit, A. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ – investigates predictors and therapies.
Louison Vang, M., Shevlin, M., Hansen, M., Lund, L., Askerod, D., Bramsen, R. H., & Flanagan, N. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Lueger-Schuster, B., Knefel, M., Glück, T. M., Jagsch, R., Kantor, V., & Weindl, D. (2018).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Maercker, A., Ben-Ezra, M., Esparza, O. A., & Augsburger, M. (2019).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Maercker, A., Hecker, T., Augsburger, M., & Kliem, S. (2018).	Prevalence rates study.
Mahat-Shamir, M., Lavenda, O., Palgi, Y., Hamama-Raz, Y., Greenblatt-Kimron, L., Pitcho-Prelorentzos, S., . . . Ben-Ezra, M. (2019).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ – investigates subjective trauma outlook.
Manniche, C., Stokholm, L., Ravn, S. L., Andersen, T. E., Brandt, L. P., Rubin, K. H., . . . Skousgaard, S. G. (2020).	Unrelated to trauma- investigates spinal injury.

Marel, C., Mills, K., Visontay, R., Wilson, J., Darke, S., Ross, J., . . . Teesson, M. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
McBride, O., Hyland, P., Murphy, J., & Elklit, A. (2020).	Network Analysis.
McElroy, E., Shevlin, M., Murphy, S., Roberts, B., Makhashvili, N., Javakhishvili, J., . . . Hyland, P. (2019).	Network Analysis.
Møller, L., Augsburger, M., Elklit, A., Søgaard, U., & Simonsen, E. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ – investigates prevalence.
Nguyen Thi Quynh, C., Schilizzi, S., Hailu, A., & Iftekhar, S. (2017).	No related to trauma.
Oe, M., Ito, M., Takebayashi, Y., Katayanagi, A., & Horikoshi, M. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Olff, M., Amstadter, A., Armour, C., Birkeland, M. S., Bui, E., Cloitre, M., . . . Thoresen, S. (2019).	Review/editorial.
Olff, M., Bakker, A., Frewen, P., Aakvaag, H., Ajdukovic, D., Brewer, D., . . . Schnyder, U. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Palgi, Y., Karatzias, T., Hyland, P., Shevlin, M., & Ben-Ezra, M. (2020).	Qualitative study.
PihlThingvad, J., Andersen, L. L., Brandt, L. P. A., & Elklit, A. (2019).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Pitt, K., Feder, G. S., Gregory, A., Hawcroft, C., Kessler, D., Malpass, A., . . . Lewis, N. V. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ – interventions for trauma.
Rudd, B., Karatzias, T., Bradley, A., Fyvie, C., & Hardie, S. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Sagaltici, E., Alpak, G., & Altindag, A. (2020).	Doesn't use ITQ.
Saraiya, T. C., Fitzpatrick, S., Zumberg-Smith, K., López-Castro, T., E. Back, S., & A. Hien, D. (2020).	Doesn't use ITQ.
Scharff, F. B., Lau, M. E., Riisager, L. H. G., Møller, S. B., Salimi, M. L., Gondan, M., & Folke, S. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ – investigates interventions.
Shevlin, M., Hyland, P., Ben-Ezra, M., Karatzias, T., Cloitre, M., Vallières, F., . . . Maercker, A. (2020).	Doesn't investigate the latent structure of icd-11 PTSD/CPTSD-addresses the development and validation of the international Adjustment Disorder Questionnaire.
Shevlin, M., Hyland, P., & Karatzias, T. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Shevlin, M., Hyland, P., Vallières, F., Bisson, J., Makhashvili, N., Javakhishvili, J., . . . Roberts, B. (2018).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ – focuses on prevalence rates.

Shrira, A., Maytles, R., & Frenkel-Yosef, M. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Silove, D., Rees, S., Mohsin, M., Tam, N., Kareth, M., & Tay, A. K. (2018).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Simon, N., Roberts, N. P., Lewis, C. E., van Gelderen, M. J., & Bisson, J. I. (2019).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Stadtmann, M. P., Maercker, A., Binder, J., & Schnepp, W. (2018).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ- focuses on treatment barriers.
Stadtmann, M. P., Maercker, A., Binder, J., & Schnepp, W. (2018).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ- focuses on symptom management.
Sölva, K., Haselgruber, A., & Lueger-Schuster, B. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ- mediation analysis.
Telesetsky, A. (2014).	Not related to trauma.
Tsur, N. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Tsur, N. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Tsur, N., Katz, C., & Klebanov, B. (2020).	Qualitative study.
Tsur, N., & Abu-Raiya, H. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ- mediation analysis.
Urizzi, F., Tanita, M. T., Festti, J., Cardoso, L. T. Q., Matsuo, T., & Grion, C. M. C. (2017).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
van Der Kolk, B., Ford, J. D., & Spinazzola, J. (2019).	Doesn't use the ITQ.
van Toorenburg, M. M., Sanches, S. A., Linders, B., Rozendaal, L., Voorendonk, E. M., Van Minnen, A., & De Jongh, A. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ- focuses on treatment interventions.
Vang, M. L., Ben-Ezra, M., & Shevlin, M. (2019).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ.
Vasilopoulou, E., Karatzias, T., Hyland, P., Wallace, H., & Guzman, A. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ- mediation analysis.
Villalta, L., Smith, P., Hickin, N., & Stringaris, A. (2018).	Doesn't use ITQ.
Voorendonk, E. M., De Jongh, A., Rozendaal, L., & Van Minnen, A. (2020).	Doesn't investigate latent structure of ICD-11 PTSD/CPTSD using the ITQ- focuses on treatment interventions.
Williamson, V., Pearson, E. J., Shevlin, M., Karatzias, T., Macmanus, D., & Murphy, D. (2020).	Qualitative.

Zhu, J., Wekerle, C., Lanius, R., & Frewen, P. (2019).	Doesn't use the ITQ.
McBride, O., Murphy, J., Shevlin, M., Gibson-Miller, J., Hartman, T. K., Hyland, P., ... & Bentall, R. P. (2020).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling.
Leightley, D., Rona, R. J., Shearer, J., Williamson, C., Gunasinghe, C., Simms, A., ... & Murphy, D. (2020).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling.
Vallières, F., Gilmore, B., Nolan, A., Maguire, P., Bondjers, K., McBride, O., ... & Hyland, P. (2020).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling.
Brewin, C. R., Miller, J. K., Soffia, M., Peart, A., & Burchell, B. (2020).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling.
Kerig, P. K., Mozley, M. M., & Mendez, L. (2020).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling.
Lobban, J., & Murphy, D. (2020).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling.
Brunnet, A. E., Derivois, D., Machado, W. D. L., & Haag Kristensen, C. (2020).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using ITQ.
Humayun, A., ul Haq, I., Khan, F. R., & Nasir, S. (2020).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling.
Makhashvili, N., Javakhishvili, J. D., Sturua, L., Pilauri, K., Fuhr, D. C., & Roberts, B. (2020).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling.
Jakobsen, A. V., Møller, R. S., Nikanorova, M., & Elklit, A. (2020).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling.
Leichsenring, F., Steinert, C., Beutel, M. E., Feix, L., Gündel, H., Hermann, A., ... & Hoyer, J. (2020).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling.
Gilbar, O., & Ford, J. (2020).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling.
Sölva, K., Haselgruber, A., & Lueger-Schuster, B. (2020).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling
Taggart, D., Rouf, K., Hisham, I. B. I., Duckworth, L., & Sweeney, A. (2021).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling
Dragan, M., Grajewski, P., & Shevlin, M. (2021).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling
Valiente, C., Vázquez, C., Contreras, A., Peinado, V., & Trucharte, A. (2021).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling

Facer-Irwin, E., Karatzias, T., Bird, A., Blackwood, N., & MacManus, D. (2021).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling
Vazquez, C., Valiente, C., García, F. E., Contreras, A., Peinado, V., Trucharte, A., & Bentall, R. P. (2021)	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling
Langtry, J., Owczarek, M., McAteer, D., Taggart, L., Gleeson, C., Walshe, C., & Shevlin, M. (2021).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling
Bækkelund, H., Karlsrud, I., Hoffart, A., & Arnevik, E. A. (2021).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling – randomized control trial.
Karatzias, T., Shevlin, M., Ford, J. D., Fyvie, C., Grandison, G., Hyland, P., & Cloitre, M. (2020).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling
Murphy, D., Karatzias, T., Busuttil, W., Greenberg, N., & Shevlin, M. (2021)	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling
Borroni, S., Masci, E., Franzoni, C., Somma, A., & Fossati, A. (2021).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling
Rossi, R., Socci, V., Talevi, D., Niolu, C., Pacitti, F., Di Marco, A., ... & Olff, M. (2021).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using ITQ.
Williamson, V., Greenberg, N., & Murphy, D. (2021).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using ITQ.
El-Khoury, J., Barkil-Oteo, A., & Adam, L. (2020)	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using ITQ.
Fontanesi, L., Marchetti, D., Limoncin, E., Rossi, R., Nimbi, F. M., Mollaioli, D., ... & Ciocca, G. (2021).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling
Ho, G. W., Karatzias, T., Vallières, F., Bondjers, K., Shevlin, M., Cloitre, M., ... & Hyland, P. (2021).	Doesn't investigate the latent structure of ICD-11 PTSD/CPTSD using factor analysis or mixture modelling
Haselgruber, A., Knefel, M., Sölva, K., & Lueger-Schuster, B. (2021).	Network Analysis
Terban, M. W., Ghose, S. K., Plonka, A. M., Troya, D., Juhás, P., Dinnebier, R. E., ... & Frenkel, A. I. (2021).	Unrelated to trauma related disorders.

Appendix B.1: Quality Assessment of CFA studies

	Is missing data mechanism reported?	Is a description given of how missing data in the analysis was dealt with?	Is information about distribution of observed variables provided?	Is software mentioned?	Is information on estimation procedures provided?	If covariates have been used, can analyses still be replicated?	Are goodness of fit indices described?	Is more than one model tested, and are the total number of fitted factor models reported?	Is the structure of each factor model investigated specified?	Are characteristics of the optimal factor structure numerically described?	Is a description provided of what variables are related to attrition/missing data?	Was a graphical representation of the models tested provided?	Are the syntax files available?	Total Yes (Essential)	Total No (Essential)
Ben-Ezra et al (2018)	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y		8	2
Cloitre et al (2018)	n/a	n/a	Y	Y	Y	Y	Y	Y	Y	Y	n/a	Y		10	0
Gilbar et al (2018)	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y		9	1
Hansen et al (2017)	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N		8	2
Haselgruber et al (2020a)	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		9	1
Ho et al (2020)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y*	10	0
Ho et al (2019)	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y*	8	2
Hyland et al (2017)	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y		9	1
Karatzias et al (2018)	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N		8	2
Kazlauskas et al (2020)	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y*	8	2
Kazlauskas et al (2018)	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y		8	2
Mordeno et al (2019)	n/a	n/a	Y	Y	Y	Y	Y	Y	Y	Y	n/a	Y		10	0
Murphy et al (2018)	N	N	Y	Y	N	Y	Y	Y	Y	Y	N	Y		7	3
Owczarek et al (2020)	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y		8	2
Rocha et al (2020)	N	N	N	N	N	N	N	N	N/A	N	N	N		0	10

Sele et al (2020)	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y		8	2
Somma et al (2019)	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y		9	1
Vallieres et al (2018)	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y		9	1
Shevlin et al (2018)	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N		8	2
Karatzias et al (2020)	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y		9	1
Hyland et al (2019)	n/a	n/a	Y	Y	Y	Y	Y	Y	Y	Y	n/a	Y		10	0
Frost et al (2019)	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y		8	2
Choi et al (2021)	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y		8	2
Choi et al (2020)	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y		8	2
Haselgruber et al (2020b)	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y		9	1
Total Yes	2	7	24	24	23	24	24	24	24	24	1	21	3		
Total No	20	15	1	1	2	1	1	1	0	1	21	4	22		
Total not applicable(no missing data)	3	3							1		3				

Appendix B.2: Quality Assessment of Mixture Model Studies

	Is information presented about the frequency and percentage of endorsement of all items?	Is the missing data mechanism reported?	Is a description provided about how missing data in the analyses were dealt with?	Is information about the distribution of observed variables included?	Are parameter restrictions reported?	If covariates have been used, can analysis be replicated?	Is information reported on number random start values and final iterations?	Are model comparison tools described from statistical perspective?	Are the total number of fitted models reported?	Are the number of cases per class reported?	Is entropy reported?	Are tables/plots/charts included with response patterns of classes in final solution?	Is a description provided of what variables are related to attrition/missing data?	Are tables/plots//charts included with the response patterns of the classes/profiles for each model?	Are the syntax files available?	Total yes (essential)	Total no (essential)
Ben Ezra et al (2018)	Y	N	N	Y	N	Y	Y	Y	Y	Y	N	Y	N	N		8	4
Haselgruber et al (2020)	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N		10	2
Hyland et al (2018)	Y	N	N	Y	N	Y	Y	Y	Y	Y	N	Y	N	N		8	4
Karatzias et al (2018)	Y	N	N	Y	N	Y	Y	Y	Y	Y	N	Y	N	N		8	4
Kazlauskas et al (2020)	Y	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N	Y*	9	3
Kazlauskas et al (2018)	Y	N	N	Y	N	Y	N	Y	Y	Y	Y	Y	N	N		8	4
Tian et al (2020)	Y	n/a	n/a	Y	N	Y	N	Y	Y	Y	Y	Y	n/a	N	Y*	8	2
Vang et al (2019)	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N		10	2
Jowett et al (2020)	Y	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N		9	3
Choi et al (2021)	Y	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N		9	3
Rink & Lipinska (2020)	Y	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N	Y	9	3
Curier et al (2021)	Y	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N		9	3

Total yes	12	0	2	12	0	12	10	12	12	12	9	12	2	0	3		
Total no	0	11	9	0	12	0	2	0	0	0	3	0	9	12	9		
Total not applicable		1	1										1				

*Note * : available on request*

[i] *Note: It was not possible to impose the language search limiter on the Psycinfo database search due to the unnecessary omission of relevant studies when this limiter was (for example, Owczarek et al., 2019, Hyland et al., 2019).