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A Review of Current Evidence Regarding the ICD-11 Proposals for Diagnosing PTSD and Complex PTSD

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Abstract

The World Health Organization's proposals for posttraumatic stress disorder (PTSD) in the 11th edition of the International Classification of Diseases, scheduled for release in 2018, involve a very brief set of symptoms and a distinction between two sibling disorders, PTSD and Complex PTSD. This review of studies conducted to test the validity and implications of the diagnostic proposals generally supports the proposed 3-factor structure of PTSD symptoms, the 6-factor structure of Complex PTSD symptoms, and the distinction between PTSD and Complex PTSD. Estimates derived from DSM-based items suggest the likely prevalence of ICD-11 PTSD in adults is lower than ICD-10 PTSD and lower than DSM-IV or DSM-5 PTSD, but this may change with the development of items that directly measure the ICD-11 re-experiencing requirement. Preliminary evidence suggests the prevalence of ICD-11 PTSD in community samples of children and adolescents is similar to DSM-IV and DSM-5. ICD-11 PTSD detects some individuals with significant impairment who would not receive a diagnosis under DSM-IV or DSM-5. ICD-11 CPSTD identifies a distinct group who have more often experienced multiple and sustained traumas and have greater functional impairment than those with PTSD.

The diagnosis of posttraumatic stress disorder (PTSD) was first introduced in the 3rd edition of the Diagnostic and Statistical Manual (DSM) (American Psychiatric Association, 1980), proving immediately influential and leading to decades of important and innovative research. Subsequent editions of the DSM in 1987 and 2000 refined and improved the diagnosis, culminating in the most recent version, DSM-5 (American Psychiatric Association, 2013). Despite the popularity of the diagnosis, it has been controversial in some quarters and there have been persistent questions about whether its formulation in the DSM is optimal. The 11th revision of the World Health Organization's (WHO) International Classification of Diseases (ICD-11) is currently nearing completion (First, Reed, Hyman, & Saxena, 2015). ICD adopts a public health perspective and is organized around maximizing clinical utility for the use of diagnoses worldwide. ICD-11 has proposed a substantially different approach to diagnosing PTSD, primarily simplifying the conceptualization of disorder but also distinguishing between basic and complex forms of the condition (Maercker, Brewin, Bryant, Cloitre, van Ommeren, Jones et al., 2013). The dissemination of these proposals has led to important discussions in the field (Miller, Wolf, & Keane, 2014). ICD-11 is scheduled for release in 2018, and in this article we review emerging evidence about the new formulation of PTSD and CPTSD that speaks to whether the proposals are useful in principle and whether revisions of this formulation may be necessary. Most of this evidence concerns adults; there are some data on children and adolescents and developmental formulations of the proposals are underway but detailed consideration of them is beyond the scope of this article.

By the time of DSM-III-R in 1987, PTSD was already one of the most complex diagnoses in the manual. It included 17 symptoms divided into three clusters, with different thresholds for each cluster, and two additional criteria concerning the nature of the stressor and the duration of symptoms. DSM-IV added another criterion, the presence of clinically

significant distress or impairment. In DSM-5, the three symptom clusters were increased to four on the basis of factor analytic findings, three further symptoms were added, and a dissociative subtype was included for the first time. These successive changes resulted in a comprehensive description of the disorder, but have had several costs. One is that the diagnosis can now be based on over half a million different combinations of symptoms (Galatzer-Levy & Bryant, 2013). Another is that even with the more limited symptom combinations in DSM-IV it has proved difficult for non-specialists to confidently identify and diagnose it, which may partly account for the finding that levels of recognition among non-psychiatric physicians are poor (Brewin, Fuchkan, Huntley, Robertson, Thompson, Scragg et al., 2010; de Bont, van den Berg, van der Vleugel, de Roos, de Jongh, van der Gaag et al., 2015; Ehlers, Gene-Cos, & Perrin, 2009; Liebschutz, Saitz, Brower, Keane, Lloyd-Travaglini, Averbuch et al., 2007).

Many of the symptoms included as criteria for PTSD in the DSM-IV and DSM-5 overlap with other disorders: Sleep disturbance, concentration problems, and irritability are characteristic of generalized anxiety disorder (GAD); depression is characterized by these same three symptoms but also by negative beliefs about oneself and the world, self-blame, diminished interest in activities, detachment from others, and emotional numbing. It is therefore unsurprising that rates of comorbidity are very high, particularly with depression (Brady, Killeen, Brewerton, & Lucerini, 2000). Studies investigating the correlates of different latent factors of PTSD have found that symptoms characteristic of anxiety and depression appear to be more strongly related to those factors reflecting general dysphoria rather than to the more specific aspects of PTSD reflecting re-experiencing, active avoidance, and hyperarousal (Byllesby, Durham, Forbes, Armour, & Elhai, 2016; Contractor, Durham,

Brennan, Armour, Wutrick, Frueh et al., 2014; Durham, Elhai, Fine, Tamburrino, Cohen, Shirley et al., 2015; Gootzeit & Markon, 2011).

Other evidence for non-specificity comes from studies that have examined whether PTSD symptoms are more common following events that, according to the successive definitions adopted by the DSM, are traumatic as opposed to distressing (but non-traumatic). The option of removing the requirement that one be exposed to a traumatic event was contemplated by the DSM-5 Work Group (Friedman, Resick, Bryant, & Brewin, 2011). Although this committee recognized that PTSD symptoms can develop following non-traumatic events, it decided to retain the traumatic event as a gatekeeper criterion for the diagnosis because "intrusion and avoidance symptoms are incomprehensible without prior exposure to a traumatic event" (p. 754). However, a recent meta-analysis (Larsen & Pacella, 2016) showed that PTSD symptoms were only slightly more common following events defined as traumatic versus non-traumatic according to the DSM, and this advantage disappeared if subjective ratings of fear, helplessness, and horror (required in DSM-IV but not in DSM-5) were omitted. Moreover, the structure of DSM-5 PTSD symptoms is essentially the same whether or not individuals have experienced events meeting the criteria for a trauma (Zelazny & Simms, 2015).

One implication that has been drawn is that many of the PTSD symptoms included in the DSM are general reactions to adversity rather than specific reactions to trauma (Brewin, 2003). This non-specificity in the clinical picture painted by the DSM is possibly one of the reasons why, although much is known about the biological correlates of PTSD, there are as yet no specific biomarkers for the condition (Lehrner & Yehuda, 2014). For example, reductions in brain volume associated with PTSD have not been able to be distinguished from similar patterns associated with depression (Kroes, Rugg, Whalley, & Brewin, 2011).

Such observations have led previous authors to question whether comorbidity would be reduced with a smaller symptom set consisting of those more specific to PTSD such as flashbacks, nightmares, startle, and hypervigilance (Davidson & Foa, 1991). Another proposal (Spitzer, First, & Wakefield, 2007) involved eliminating a symptom considered to be of doubtful validity (impaired recall of the trauma) as well as symptoms shared with depression and GAD (irritability, insomnia, difficulty concentrating, and markedly diminished interest). The effect of this suggested change on comorbidity with a variety of disorders was tested in three studies, two of which showed no significant differences relative to DSM-IV (Elhai, Grubaugh, Kashdan, & Frueh, 2008; Grubaugh, Long, Elhai, Frueh, & Magruder, 2010) whereas the third, conducted with an adolescent sample, suggested less comorbidity with depression associated with the Spitzer et al. symptom set (Ford, Elhai, Ruggiero, & Frueh, 2009). In these studies, however, the samples meeting the DSM-IV versus the Spitzer et al. criteria for PTSD overlapped to a considerable extent, with most of the PTSD cases appearing in both. A clearer picture would be given by comparing non-overlapping samples who met the DSM-IV but not the Spitzer et al. criteria, or vice versa.

A final suggestion to decrease the symptom set (Brewin, Lanius, Novac, Schnyder, & Galea, 2009) proposed requiring at least one of two symptoms specifically reflecting re-experiencing of the traumatic event in the present (corresponding to the DSM items assessing flashbacks or nightmares), at least one of two symptoms specifically reflecting active avoidance (corresponding to the DSM items assessing avoidance of internal thoughts or external reminders), and at least one of two symptoms (hypervigilance or exaggerated startle) reflecting the continuing sense of threat identified as characteristic of PTSD (Ehlers & Clark, 2000). Under this proposal there are only 27 combinations of qualifying symptoms. As with the Davidson and Foa (1991) proposal, the intention was to include those symptoms that best

discriminated PTSD from other disorders. A more detailed rationale for the choice of symptoms can be found elsewhere (Brewin, 2013; Brewin et al., 2009).

ICD-11 Proposals for PTSD and Complex PTSD

A modified version of the Brewin et al. (2009) formulation, along with many other changes to ICD-10 PTSD, have been incorporated in the proposed diagnostic requirements for PTSD in ICD-11 (Maercker et al., 2013). Exposure to trauma, defined as an extremely threatening or horrific event or series of events, is required. The essential feature of re-experiencing requires that the traumatic event is not just remembered involuntarily but is experienced as occurring again in the here and now, in the form of vivid intrusive images or memories, flashbacks, or repetitive dreams or nightmares. As in DSM-5, flashbacks are defined as existing on a continuum of severity such that they involve (rarely, at the more severe end) a complete loss of awareness of present surroundings and are equivalent (much more commonly, at the milder end) to vivid intrusive images and memories experienced as happening in the here and now. This distinguishes ICD-11 re-experiencing from more general intrusive memories (e.g., DSM-5 symptom B1), which are found in many psychiatric disorders (Brewin, Gregory, Lipton, & Burgess, 2010; Bryant, O'Donnell, Creamer, McFarlane, & Silove, 2011). Again similarly to DSM-5, verbal thoughts about the event are no longer a symptom of PTSD. If the person is unable to recall the trauma (for example, because of a head injury), an alternative proposed re-experiencing symptom is emotional distress on reminders of the traumatic event (DSM-5 symptom B4). Both avoidance and a heightened sense of threat are essential features of ICD-11. This is similar to the two deliberate avoidance items in DSM-5 (symptoms C1 and C2), and two items from the hyperarousal cluster related to an ongoing sense of threat (symptoms E4 and E5). In addition to requiring at least one symptom of re-experiencing, avoidance, and sense of threat, other

features of the ICD-11 PTSD diagnosis are that the disorder has to be present for several weeks and there has to be significant functional impairment.

Another new development for ICD-11 is the proposal for a sibling disorder, Complex PTSD (CPTSD). This is, in part, a reformulation in more specific terms of the previous ICD-10 diagnosis F62.0 "Enduring personality change after catastrophic experience" (EPCACE) and, like its predecessor, describes the disturbances in self-organization that can sometimes result from multiple, chronic or repeated traumas from which escape is difficult or impossible (e.g., childhood abuse, domestic violence, torture, war imprisonment). The ICD-11 CPTSD diagnosis is comprised of six symptom clusters: three are shared with PTSD (re-experiencing, avoidance, and sense of threat) and three additional symptom clusters related to disturbances in self-organization (DSO), specifically: affect dysregulation, negative self-concept and difficulties in relationships.

In contrast to EPCACE, CPTSD does not require a demonstrable personality change. However, the problems associated with CPTSD which reflect disturbances in self-organization are expected to be sustained and pervasive, and occur in a variety of contexts. Another diagnosis that has previously been suggested to capture responses to chronic or repeated trauma is "Disorders of Extreme Stress Not Otherwise Specified" (DESNOS) which was included in the Appendix to DSM-IV (American Psychiatric Association, 2000). The DESNOS diagnosis has been operationalized using 48 possible symptoms, organized into 6 scales and 27 subscales (Pelcovitz, van der Kolk, Roth, Mandel, Kaplan, & Resick, 1997). ICD-11 CPTSD shares a similar conceptual frame as DESNOS, particularly the emphasis on affect dysregulation, negative self-concept and relational difficulties and is in part empirically derived from it. However, the proposed CPTSD diagnosis is expected to be comprised of 12

symptoms, in line with the ICD-11 emphasis on clinical utility, which includes limiting the number of symptoms that make up a diagnosis.

The decision to ground the CPTSD diagnosis in core PTSD symptoms, as well as problems in self-organization, derived largely from review of the empirical literature. Results from the DSM-5 field trial investigating DESNOS revealed substantially higher rates of endorsement of symptoms representative of disturbances in affective, self, and relational domains among those with early-life chronic trauma relative to those with other types of trauma history (van der Kolk, Roth, Pelcovitz, Sunday, & Spinazzola, 2005). The DSM-IV field trial data also found that nearly all of those who met criteria for DESNOS also met criteria for PTSD (Roth, Newman, Pelcovitz, van der Kolk, & Mandel, 1997), supporting the decision to incorporate the PTSD symptoms into the ICD-11 CPTSD diagnosis. The selection of the DSO symptoms was based on identifying those symptoms most frequently endorsed in the DSM-IV DESNOS field trial (van der Kolk, Roth, Pelcovitz, & Mandel, 1993) as well as those identified as most impairing by expert clinicians in a recent consensus survey on CPTSD (Cloitre, Courtois, Charuvastra, Carapezza, Stolbach, & Green, 2011).

In summary, ICD-11 CPTSD shares with EPCACE and DESNOS an emphasis on changes in self-organization and the expectation that these changes typically result from exposure to sustained or multiple traumas from which escape is difficult or impossible. In contrast to EPCACE, CPTSD does not describe these symptoms as personality changes and in contrast to DESNOS, the number of symptoms is relatively small. Unlike both disorders, CPTSD includes the three symptom clusters of re-experiencing, avoidance and threat. Lastly, in contrast to both disorders and consistent with ICD-11 PTSD, functional impairment is explicitly identified as a requirement for the disorder.

It has been debated whether or not complex PTSD is actually PTSD comorbid with Borderline Personality Disorder (BPD). The proposed diagnostic requirements for CPTSD include several features that can be clearly differentiated from BPD. While both disorders share symptoms related to problems in emotion regulation, they are quite distinct in other symptom domains. BPD is typically characterized by an unstable sense of self that alternates between highly positive or negative self-evaluation and by emotionally intense and unstable relationships that vacillate between idealizing and denigrating perceptions of others. CPTSD in contrast is defined by a stable, although deeply negative sense of self and perceptions of relationships as painful and generally avoided. The presence of a trauma history is not a requirement for a diagnosis of BPD, while it is a prerequisite for the diagnosis of CPTSD. Data supporting these and other definitional differences, including endorsement of suicidality are discussed under the section of the manuscript concerning construct validity for CPTSD.

Evidence for Proposed ICD-11 PTSD

This section summarizes emerging evidence for the factor structure of PTSD, and for its prevalence, comorbidity, validity, and ease of use. One limitation of much of this evidence is that the new ICD-11 re-experiencing requirement does not map exactly onto the corresponding items written for DSM-IV or DSM-5 for which data are available. For example, symptom B1 in DSM-IV includes intrusive thoughts (now excluded from DSM-5 and ICD-11). In DSM-5 the B1 symptom refers more narrowly to spontaneous, recurrent memories of the event that usually include sensory, emotional, or physiological components. Although it does not specify that memories be re-experienced in the present, arguably it now encompasses more of the spirit of re-experiencing that is made explicit in ICD-11. ICD-11 re-experiencing has therefore usually been approximated by using DSM-based items assessing

nightmares (B2) and flashbacks (B3), even though items assessing the latter are not written in a way that corresponds to how ICD-11 (or DSM-5) define them. An instrument that more accurately addresses the re-experiencing requirement is currently under development (Cloitre, Roberts, Bisson, & Brewin, 2015). In contrast, the avoidance and sense of threat items are readily approximated using DSM-based measures.

Factor Structure

Confirmatory factor analyses of PTSD symptoms have been widely conducted, in large part because of the division of symptoms in succeeding editions of the DSM into varying numbers of clusters. These analyses seek to demonstrate that the clusters correspond to distinct components of the overall diagnosis, and that individual symptoms are correctly assigned to their appropriate cluster. For example, factor analyses led to the decision to create an additional cluster in DSM-5 to distinguish the active avoidance from the numbing symptoms (Friedman et al., 2011).

In a sample of West Papuan refugees, a variety of DSM-based models were found to fit the data well, along with a correlated three-factor model of PTSD in-line with the ICD-11 formulation (Tay, Rees, Chen, Kareth, & Silove, 2015). Another study assessed the performance of the proposed ICD-11 structure in Australian injury patients six years post-trauma (Forbes, Lockwood, Creamer, Bryant, McFarlane, Silove et al., 2015). The three-factor solution again provided an excellent fit to the data. In this sample, the correlation between re-experiencing and avoidance symptoms was very high, and a two-factor solution consisting of these symptoms combined plus a sense of threat factor provided fit results equal to those of the three-factor model. This more parsimonious structure was also tested in a sample of Finnish school students and again found to be superior to the three-factor model

due to an exceptionally high correlation between re-experiencing and avoidance (Haravuori, Kiviruusu, Suomalainen, & Marttunen, 2016).

One study assessed the factor structure of PTSD in a group of Austrians over the age of 60 who had experienced their trauma decades earlier (Glück, Knefel, Tran, & Lueger-Schuster, 2016). The adequacy of a 1-factor solution (all six symptoms loading onto a single PTSD factor), the 2-factor solution as proposed by Forbes et al. (2015), and the ICD-11 3-factor solution was tested. In this sample all models fit the data very well, with one index of model fit favoring the 1-factor model but three alternative indices favoring the 3-factor model.

In the most comprehensive comparison of different models conducted to date (Hansen, Hyland, Armour, Shevlin, & Elklit, 2015), the ICD-11 3-factor structure was compared to the DSM-5 4-factor structure and to alternative 5-factor and 6-factor DSM-5 models in seven independent Danish trauma samples. These included bereaved parents, road traffic accident victims, paraplegia sufferers, physical assault victims, incest victims, sexual assault victims, and a mixed trauma sample receiving treatment. In contrast to the DSM-5 models, none of which demonstrated acceptable model fits, the ICD-11 model showed an excellent fit to the data in all samples except incest victims. Moreover, the fit was equally good for men and women. Similar support for the 3-factor ICD-11 model was found in a study of former German political prisoners, using the Impact of Event Scale - Revised (Weiss & Marmar, 1996) to model ICD-11 PTSD (Hyland, Brewin, & Maercker, 2017). In this sample the three-factor model provided an excellent representation of the data, but a one-factor model and the two-factor model of Forbes et al. (2015) were rejected as poor representations of the data.

Finally, the ICD-11 model showed an excellent fit to the data as well as strong gender invariance in a study of pre-adolescent children exposed to Hurricane Ike (La Greca, Danzi, & Chan, 2017). Overall, therefore, in the great majority of studies the ICD-11 3-factor solution has been at least as good as, if not better than, other ways of describing the structure of PTSD symptoms.

Other Structural Analyses

Instead of the traditional view that symptoms reflect underlying latent constructs, an emerging alternative perspective proposes that symptoms are causally related amongst themselves. Such relations are empirically tested by a data analytic technique known as network analysis. Four studies to date have conducted such analyses on the inter-relations among PTSD symptoms.

The first study, conducted with earthquake survivors in China (McNally, Robinaugh, Wu, Wang, Deserno, & Borsboom, 2015), reported that, even after associations with all other variables were controlled, strong interconnections existed between intrusive memories, nightmares, and flashbacks, between avoidance of thoughts of the trauma and avoidance of activities reminiscent of the trauma, and between hypervigilance and exaggerated startle. A second study was conducted with Australian accident victims (Bryant, Creamer, O'Donnell, Forbes, McFarlane, Silove et al., 2017). There were strong interconnections in the acute phase between flashbacks, intrusions, and avoidance of thoughts. At the 12-month assessment, the associations between re-experiencing symptoms were stronger, and physiological reactivity to trauma reminders was strongly associated with the startle response, which was also associated with hypervigilance. Thus, although the analyses reported by the first two studies were consistent with the 3-factor ICD-11 structure, the Bryant et al. study found connections between re-experiencing and avoidance, reminiscent of the 2-factor

structure of ICD-11 symptoms previously reported in this same sample by Forbes et al. (2015).

The third and fourth studies (Armour, Fried, Deserno, Tsai, & Pietrzak, 2017; Mitchell, Wolf, Bovin, Lee, Green, Rosen et al., 2017) were both conducted with U.S. military veterans using the DSM-5 symptom set. Armour et al. reported especially strong connections between nightmares and flashbacks, and between hypervigilance and an exaggerated startle response. Similarly, Mitchell et al. reported strong connections between avoidance of external reminders and avoidance of thoughts and memories, between hypervigilance and an exaggerated startle response, and between intrusive distressing memories and distressing dreams. The studies differed markedly, however, in which symptoms appeared to be most central to the network with the exception that both identified the centrality of negative emotional state. As DSM-5 and ICD-11 PTSD are defined very differently, it is a matter of debate whether one would expect the ICD-11 symptom set to appear as central items in a network analysis that included all the DSM-5 symptoms.

Another approach to assessing structure is to look for evidence that cases identified by a set of diagnostic rules form a distinct group who are qualitatively different from the rest of the sample, rather than simply having similar but more severe symptoms. In the past such taxometric analyses have not supported the idea that PTSD as diagnosed by the DSM does form a distinct category, but rather have suggested that it represents the upper end of a continuum (Broman-Fulks, Ruggiero, Green, Kilpatrick, Danielson, Resnick et al., 2006; Broman-Fulks, Ruggiero, Green, Smith, Hanson, Kilpatrick et al., 2009; Forbes, Haslam, Williams, & Creamer, 2005; Ruscio, Ruscio, & Keane, 2002). A recent study conducted similar taxometric analyses both using DSM-IV and ICD-11 formulations of PTSD (Kliem, Kröger, Foran, Mößle, Glaesmer, Zenger et al., 2016). The authors replicated the dimensional

solution previously found for DSM-IV, but the results suggested a categorical solution for ICD-11. The taxon group (corresponding to ICD-11 PTSD) reported more physical and mental symptoms, more suicidal thoughts relative to the remainder of the sample, and were more likely to be seeking treatment.

Prevalence

A number of studies, including one using World Mental Health Survey data from 13 countries and nearly 24,000 respondents (Stein, McLaughlin, Koenen, Atwoli, Friedman, Hill et al., 2014), have now investigated prevalence rates by estimating the ICD-11 diagnostic requirements and comparing rates with those generated by ICD-10, DSM-IV, and DSM-5 formulations. These are listed in Appendix A. It can be seen that although the level of agreement between the presence or absence of a diagnosis using ICD-11 and the DSM is generally high, the prevalence in adult samples using ICD-11 is somewhat lower. ICD-11 rates are also reduced, to a larger extent, relative to ICD-10. A number of studies have identified that the diagnostic requirements for re-experiencing (Hyland, Shevlin, McNally, Murphy, Hansen, & Elklit, 2016; Morina, van Emmerik, Andrews, & Brewin, 2014; Stammel, Abbing, Heeke, & Knaevelsrud, 2015; van Emmerik & Kamphuis, 2011), and hyperarousal (Hyland et al., 2016; Stammel et al., 2015; van Emmerik & Kamphuis, 2011) are more stringent in ICD-11 than the DSM, whereas the requirements for avoidance are more stringent in DSM-IV than in ICD-11 (Morina et al., 2014; Stammel et al., 2015; van Emmerik & Kamphuis, 2011). It is likely that the absence of non-specific symptoms such as intrusive thoughts and memories, which do not satisfy the ICD-11 requirement of re-experiencing, are responsible for the difference in prevalence rate relative to DSM-IV or DSM-5 (Hafstad, Thoresen, Wentzel-Larsen, Maercker, & Dyb, 2017; Hyland et al., 2016;

O'Donnell, Alkemade, Nickerson, Creamer, McFarlane, Silove et al., 2014; Sachser & Goldbeck, 2016).

Importantly, there is evidence that ICD-11 and DSM-5 identify only partially overlapping groups of cases, and that neither is comprehensive. This is not surprising because different diagnostic requirements would be expected to identify different individuals. For example, studies have noted the sometimes substantial lack of concordance between DSM-IV and DSM-5 diagnostic decisions for PTSD (Hafstad, Dyb, Jensen, Steinberg, & Pynoos, 2014; Hoge, Riviere, Wilk, Herrell, & Weathers, 2014). Each diagnostic system appears to find a number of comparably impaired individuals that the other does not although, in line with the difference in prevalence rates, DSM-IV and DSM-5 identify more unique cases than does ICD-11.

Data on children and adolescents need to be treated with caution owing to the possible need for changes to diagnostic requirements reflecting developmental concerns. For example, DSM-5 contains a new subtype of PTSD applicable to pre-school children. Further specification of diagnostic requirements for pre-school and pre-adolescent children are likely to follow within both ICD and DSM formulations.

An excess of PTSD cases diagnosed with DSM-IV relative to ICD-11, similar to that reported in adult samples, was found in a clinical sample of children and adolescents (Sachser & Goldbeck, 2016). However, studies with community samples have reported different results. Prevalence rates in two samples of hurricane-exposed pre-adolescents were very similar using DSM-IV, DSM-5, and ICD-11 (Danzi & La Greca, 2016). In this study both ICD-11 and DSM-IV identified a considerable number of cases that the other diagnostic systems did not. A study of PTSD related to school shootings in Finland found that ICD-11 identified slightly more cases than DSM-IV (Haravuori et al., 2016). Finally, Hafstad and

colleagues studied young survivors of the Norwegian Utøya massacre and found that rates of PTSD were similar whether measured with ICD-11 or DSM-5 (Hafstad et al., 2017). Uniquely, the authors used the same instruments on their sample's parents, finding by contrast that in this older group rates of PTSD were much higher when measured with DSM-5 than with ICD-11. Further research is needed to determine whether this difference is best accounted for by the contrasting ages of the samples or by the fact that only one was directly exposed to personal life threat.

Comorbidity, Validity, and Ease of Use

As discussed above, the most accurate estimate of the consequences of a new method of diagnosis is obtained by comparing cases who meet one set of requirements but not the other, and vice versa. Where this has been done, as shown in Appendix A, there is clear evidence that comorbidity with depression is significantly reduced under ICD-11. A similar analytic approach has rarely been applied to validity issues but, again as shown in Appendix A, there is some evidence that quality of life is lower under ICD-11 than ICD-10 PTSD, and that pure ICD-11 cases are associated with higher levels of distress or impairment than cases diagnosed using other methods. More generally, there is little evidence that the association of ICD-11 PTSD with anxiety, depression, or other indicators of psychological distress and well-being, differs substantially from that of other ways of diagnosing PTSD.

Field trials were conducted to test the ease of use of the new diagnoses through an internet-based study involving mental health professionals from many parts of the world (Keeley, Reed, Roberts, Evans, Medina-Mora, Robles et al., 2016; Keeley, Reed, Roberts, Evans, Robles, Matsumoto et al., 2016). A sample of 1738 mental health professionals participated and rated pairs of vignettes that contrasted features of ICD-10 and ICD-11 diagnostic guidelines for PTSD. One pair contrasted the symptom of re-experiencing in the

present with more general intrusive memories of the traumatic event. The majority of professionals were more likely to diagnose PTSD if there was re-experiencing in the present, but this occurred to an equivalent extent under ICD-10 and ICD-11, suggesting that this distinction was already in clinicians' minds. However, those endorsing ICD-11 PTSD from the vignette that did not contain re-experiencing in the present were likely to express doubt over this symptom, suggesting a need for greater clarity or education concerning the concept. Similar results were obtained when the pair of vignettes contrasted a presence versus a lack of functional impairment.

The Keeley et al. study also found that discrimination between PTSD and adjustment disorder was better under ICD-11 than ICD-10. Importantly, a tendency was detected on the part of some clinicians to base diagnoses on the type of stressor event rather than on the specific pattern of symptoms. Overall, the data indicated that the ICD-11 diagnostic rules are viable but that educational efforts will be needed - as with the introduction of any new diagnostic system - to have clinicians understand and apply them in a consistent way. The proposed ICD-11 diagnostic guidelines for Disorders Specifically Associated with Stress were revised based on the results of the Keeley et al. study, and are currently available for review and comment at https://gcp.network/en/icd-11-guidelines.

Summary

A substantial amount of preliminary data from many parts of the world are now available based on estimates of the proposed ICD-11 PTSD diagnosis derived from existing instruments. These suggest the following interim conclusions. First, the proposed three-factor structure of PTSD, operationalized with two core symptoms representing each factor, routinely provides a very good fit to the data, although there may be some populations (e.g., incest victims or physically injured accident victims) where the fit is not optimal. Second,

consistent with the new requirement for functional impairment, prevalence rates are considerably less than ICD-10. Third, consistent with the more narrow formulation of ICD-11 PTSD, prevalence rates are significantly reduced relative to DSM-IV and DSM-5 in adults, although very preliminary evidence on some age groups suggest that there are no consistent differences in children and adolescents. These lower prevalence rates, however, are based on estimates derived from instruments not designed to measure ICD-11 re-experiencing, and may change in the future. ICD-11 PTSD does not just identify a subset of cases diagnosed with DSM-IV or DSM-5, but detects some who would not be diagnosed using the other systems. Fourth, comorbidity with depression appears to be reduced under ICD-11. Fifth, initial evidence of validity suggests that ICD-11 PTSD detects cases who are of approximately equal severity to DSM-IV and DSM-5 cases and who are on average more severe than ICD-10 cases.

Evidence for Proposed ICD-11 Complex PTSD

Construct Validity

An important initial question regarding the proposed CPTSD diagnosis is whether, in fact, CPTSD describes a class of individuals who are distinct from those with PTSD and who differ from those with PTSD by having a more "complex" symptom profile comprised of a greater number and type of clinically significant symptoms. The distinction between PTSD and CPTSD has been supported in several latent class and latent profile analyses. To date, 10 studies (see Appendix B) have been published and 9 of them identified the presence of at least two distinct symptom profiles, one describing a group of individuals endorsing high levels of CPTSD symptoms in all six clusters (re-experiencing, avoidance, sense of threat, affect dysregulation, negative self-concept, and disturbances in relationships), and another reporting high levels of PTSD symptoms but low levels of symptoms related to DSO.

Two of the nine studies concern children and adolescents and, similar to the findings among adults, have reported distinct classes of PTSD and CPSTD, in one study among a community sample of adolescents and young adults (Perkonigg, Hofler, Cloitre, Wittchen, Trautmann, & Maercker, 2016), and in the other among a clinical sample of children and adolescents (Sachser, Keller, & Goldbeck, 2016). The presence of distinct symptom profiles as early as childhood and adolescence is of interest, particularly in regard to whether there are developmentally sensitive and specific risk factors that may differentially contribute to each of the symptom profiles. Little is known to date; contributors may include not only trauma history but also individual genetic vulnerability, the social environment, including caregivers, or some combination of these factors.

Differences in latent class and latent profile analyses are observed depending on whether the study evaluates clinical or community samples. Studies of clinical samples (Cloitre, Garvert, Brewin, Bryant, & Maercker, 2013; Karatzias, Shevlin, Fyvie, Hyland, Efthymiadou, Wilson et al., 2016; Sachser et al., 2016) have identified only 2 or 3 classes, which typically represented a PTSD profile, a CPTSD profile, and occasionally a third profile low on all symptoms, describing what might be viewed as a resilient group. Community studies with larger samples (Perkonigg et al., 2016) or those with highly diverse samples (Palic, Zerach, Shevlin, Zeligman, Elklit, & Solomon, 2016) identified four or more classes. Smaller samples like those found in the clinical studies tend to have solutions with fewer classes, while more broadly representative samples tend to have solutions with a larger number of classes (Perkonigg et al., 2016). The additional classes in the community samples tended to be low on PTSD symptoms and moderately high on DSO symptoms, suggesting the presence of a group or groups that might be experiencing other disorders such as depression,

anxiety, substance abuse and dissociative disorders that are known to include a substantial proportion of trauma-exposed individuals.

One study with findings contrary to the above was reported by Wolf and colleagues (2015). Using a general population sample meeting diagnostic requirements for lifetime PTSD and a sample of trauma-exposed military veterans, the authors reported that factor-mixture modeling (FMM) found the best fit to be associated with a two-dimensional four-class model in which classes differed by severity rather than type of symptoms: Those reporting high PTSD symptoms also reported high DSO symptoms and those with low PTSD symptoms reported low DSO symptoms. The authors concluded that the FMM findings undermined the validity of a distinction between PTSD and CPTSD. However, such a conclusion could be questioned on the basis of how the DSO symptoms were measured and the specification and interpretation of the FMM solutions.

First, the seven symptoms used to represent the DSO profile are different from those in the proposed formulation of CPTSD (Cloitre et al., 2013) and used in the above published studies, suggesting that the comparability of the Wolf et al. study to the other studies is uncertain. Second, the results reported by Wolf and colleagues (2015) specified and tested a particular type of FMM. Other specifications were possible (Muthén, 2008) but not tested, and these might have produced different results. Overall, while the FMM is of interest, the study results and conclusions must be taken with caution.

There is some evidence emerging regarding the discriminant validity of CPTSD as compared to Borderline Personality Disorder (BPD). An LCA study of 310 treatment-seeking victims of childhood sexual and/or physical abuse identified four classes each with distinct symptom profiles: a group with BPD, a group with ICD-11 CPTSD but no BPD, a group with ICD-11 PTSD, and a Low Symptom group (Cloitre, Garvert, Weiss, Carlson, & Bryant,

2014). In the BPD class, 92.0% of its members fulfilled criteria for DSM-IV BPD while in the CPTSD class 77.8% fulfilled the ICD-11 diagnostic requirements for CPTSD with only 7.8% meeting criteria for DSM-IV BPD. The symptoms that distinguished risk for BPD as compared to CPTSD most strongly were: frantic about abandonment, unstable sense of self, unstable relationships, and impulsiveness, characteristics that were not salient to the CPTSD profile. In the CPTSD profile, the endorsement pattern indicated an extremely negative sense of self with no significant shifts in identity. Relationships were perceived as painful and to-be-avoided. While both disorders reference difficulties with sense of self and relationships, the content of the problems are distinct. Lastly, while nearly half of those in the BPD class endorsed self-harm and suicidal behaviors (48.7%), the rate was much lower in the CPTSD class and equivalent to that in the PTSD class (CPTSD = 14.3%, PTSD = 16.7%). Suicidality and self-harm are prominent in the symptom profile and treatment of BPD while in CPTSD, as in PTSD, these behaviors occur significantly less frequently and are not included in the diagnostic definition.

Additional support for the BPD versus CPTSD distinction comes from a network analysis of BPD, PTSD and DSO symptoms where a map of symptoms showed that those related to BPD clustered together and at a distance from and weakly related to both PTSD and DSO symptoms which were strongly related to each other (Knefel, Tran, & Lueger-Schuster, 2016).

Factor Structure

To date, seven confirmatory factor analyses of ICD-11 CPTSD symptoms have been published. An initial four-factor model comprised of PTSD, affect dysregulation, negative self-concept, and disturbances in relationships was a good fit to the data in a sample of treatment-seeking individuals who had experienced interpersonal violence (Cloitre et al.,

2013). However, the theoretical basis of the diagnosis is that the PTSD and DSO components contribute to CPTSD as higher order factors, with each higher order factor in turn supported by three first order factors corresponding to the symptom clusters. Four studies have systematically investigated possible models for organizing the symptom clusters, including the two-factor higher order models, all of them evaluating treatment-seeking individuals who had experienced some type of interpersonal violence (Hyland, Shevlin, Brewin, Cloitre, Downes, Jumbe et al., 2017; Hyland, Shevlin, Elklit, Murphy, Vallières, Garvert et al., 2017; Karatzias, Shevlin, Fyvie, Hyland, Efthymiadou, Wilson et al., 2017; Shevlin, Hyland, Karatzias, Fyvie, Roberts, Bisson et al., 2017). The key contrasts concern three possible models: a factor structure in which all the six symptom clusters are correlated with each other in a non-hierarchical fashion, a single higher-order factor supported by the six clusters, and a two-factor model represented by PTSD and DSO (see Figure 1). The two-factor higher-order model comprised of the PTSD and DSO provided the best fit to the data in all four studies. The results support the conceptual coherence of the CPTSD diagnosis as being comprised of two distinct but related components.

Figure 1 here

Finally, two studies evaluated the factor structure of CPTSD in refugees. In Tay and colleagues' (2015) sample of West Papuan refugees, the analytic plan was organized such that the first analyses simply assessed whether the symptoms of CPTSD were related to each other in a non-hierarchical fashion. If this was successful, a higher-order, single factor analysis would be conducted. Analysis of CPTSD as a six-factor structure fit the data. The next analysis, assessing a one-factor higher-order structure (CPTSD) with six first order factors was not as strong, leading to the conclusion that the six factors did not cohere under a unitary CPTSD construct. However, the authors did not test CPTSD as a two-factor higher

order model comprised of PTSD and DSO, consistent with the formulation described in the previous paragraph. In contrast, a later study of 134 refugees in Switzerland from a variety of countries of origin directly compared the one and two higher-order factor CPTSD models and found that the two-factor model was superior as well as having a very strong fit to the data (Nickerson, Cloitre, Bryant, Schnyder, Morina, & Schick, 2016). The factor analytic studies on refugees and child abuse survivors are consistent overall and support the conceptualization of CPTSD as being comprised of two over-arching components, PTSD and DSO.

Prevalence

Given that the development of a reliable measure for ICD-11 PTSD and CPTSD is currently underway, the identification of prevalence for each of these disorders can only be roughly estimated and is likely to change. However, certain patterns can be noted that are consistent with prevalence rates for previous formulations of PTSD. Specifically, prevalence ranges vary as expected depending on the sample. Following the taxonomic proposal of PTSD and CPTSD as sibling diagnoses, individuals can be diagnosed with either one or the other diagnosis but not both. Using this guideline, estimates for PTSD reported by community and nationally representative samples range from 2.3% to 3.0% while those for CPTSD range from 0.6% to 1.0% (Hyland, Murphy, Shevlin, Vallières, McElroy, Elklit et al., 2017; Wolf, Miller, Kilpatrick, Resnick, Badour, Marx et al., 2015). Estimates are substantially higher in clinical settings. To date, prevalence rates of 7.8% to 37% for PTSD and 32.8% to 42.8% for CPTSD have been reported in samples assessed in trauma clinics (Hyland, Shevlin, Elklit, et al., 2017; Karatzias et al., 2016; Nickerson et al., 2016). Based on these numbers it may be that, in general, community rates of PTSD are higher than CPTSD while the reverse relationship obtains in trauma specialty clinics.

Correlates

Several studies have provided information comparing CPTSD and PTSD by functional status, type of trauma, and sociodemographic and symptom characteristics, offering some insight into differential risk factors and outcomes.

Functional impairment. Findings regarding differences in functional impairment have been consistent. Impairment has been found to be higher in the CPTSD class as compared to the PTSD class in all studies that evaluated it (Cloitre et al., 2013; Cloitre et al., 2014; Perkonigg et al., 2016). These data support the distinction between CPTSD and PTSD in regards to differences in severity of functional impairment, which may have implications for the nature and duration of treatment.

Childhood and chronic interpersonal trauma. Consistent with the findings concerning complex PTSD in the DSM-IV field trials, childhood interpersonal trauma has been reported at significantly higher rates among those fulfilling the CPTSD as compared to the PTSD symptom profile. This includes samples with childhood sexual and physical abuse (Cloitre et al., 2013; Cloitre et al., 2014; Karatzias et al., 2016), survivors of childhood institutional abuse (Knefel, Garvert, Cloitre, & Lueger-Schuster, 2015), and those abducted as children for soldiering (Murphy, Elklit, Dokkedahl, & Shevlin, 2016). Further support for the relationship between childhood trauma and CPTSD comes from a study of a nationally representative sample of Danes (Hyland, Murphy, et al., 2017), which found that cumulative exposure to multiple forms of childhood interpersonal violence created risk of CPTSD as compared to PTSD classification in a dose-response fashion. The presence of one type of childhood interpersonal violence produced twice the risk of CPTSD relative to PTSD and that risk substantially increased with every additional event type.

CPTSD profiles have also been observed in samples reporting sustained chronic trauma in adulthood, including prisoners of war and refugees (Nickerson et al., 2016; Palic et

al., 2016). However, the presence of a CPTSD profile has emerged in samples comprised of single-incident adult traumas such as sexual assault, physical assault, and loss of a child, albeit at lower rates than PTSD (Elklit, Hyland, & Shevlin, 2014). The proportion of the samples falling into the CPTSD profile in the study by Elklit and colleagues (2014) ranged from 10% to 21% as compared 25% to 43% for the PTSD profile.

These studies demonstrate that while those who experience childhood and other chronic forms of trauma are at greater risk for CPTSD than PTSD, it also the case that a smaller proportion develop PTSD and not CPTSD (Cloitre et al., 2013; Cloitre et al., 2014; Karatzias et al., 2016; Knefel et al., 2014; Hyland, Murphy et al., 2017; Hyland, Shevlin, et et al., 2017; Murphy et al., 2016; Nickerson et al., 2016; Palic et al., 2016). Conversely, some individuals with adult-onset single traumas develop CPTSD (Elklit et al., 2014). Viewing trauma history as a risk factor rather than as a requirement for the disorders aligns with the emerging data. Such findings are not remarkable considering the potential influences of personal and environmental risk and resiliency factors. For example, the presence of CPTSD in an individual with a single adult onset trauma may be due to the severity of the event (e.g., gang rape, witnessing the violent death of one's child) as well as personal vulnerabilities (e.g., genetic predisposition) and/or environmental factors (social criticism). Conversely, a person with a history of childhood sexual abuse might develop PTSD rather than CPTSD due to the presence of protective factors (e.g., personal resiliency, supportive family system). Given that we treat symptoms not history, it is important that diagnosis is only guided, and not constrained, by the latter.

Sociodemographic and symptom characteristics. There are sociodemographic and symptom-related correlates which distinguish CPTSD and PTSD. Individuals with CPTSD relative to PTSD profiles are more likely to be unemployed, less likely to be married and

more likely to live alone (Karatzias et al., 2016). In addition, the CPTSD but not the PTSD profile has been associated with minority status, lower education and lower self-reported SES (Perkonigg et al., 2016). It should be noted that the above studies were based on cross-sectional data and it is not known whether these characteristics are causes or consequences (or both) of CPTSD. Lastly, there is some evidence that, relative to PTSD, CPTSD is associated with greater psychopathology including a greater number of co-morbid disorders (Perkonigg et al., 2016) and greater severity of comorbid symptoms (Elklit et al., 2014; Murphy et al., 2016).

The data on the role of gender are inconsistent. Some studies have found that being female increases risk for both PTSD and CPTSD (Hyland, Murphy, et al., 2017; Perkonigg et al., 2016) while two studies have not found an effect of gender on risk for either diagnosis (Cloitre et al., 2013; Wolf et al., 2015). Results are mixed regarding whether there is gender-related risk for one disorder over another. Some studies have found that female gender is associated with greater risk for CPTSD than PTSD (Knefel et al., 2015; Perkonigg et al., 2016; Sachser et al., 2016), and one has found the reverse (Hyland, Shevlin, Elklit, et al., 2017). But the majority of studies have found no gender difference between the two disorders (Cloitre et al., 2013; Hyland, Murphy et al., 2017; Karatzias et al., 2016; Murphy et al., 2016; Wolf et al., 2015). Differences in findings may be related to the nature of the samples. For example, clinical samples, which are typically comprised of self-referred individuals, may represent those suffering at the extreme end of the symptom continuum, where gender differences may no longer play an important role. Similarly, there may be certain types of extreme experiences (e.g., being abducted into child soldiering), or highly unfavorable environments (e.g., poverty, neglect) where the effect of gender relative to other factors no longer makes a significant contribution. Studies with larger samples that vary in type of

trauma exposure, environmental risks, and protective factors are necessary to determine how gender may predispose to PTSD and CPTSD.

Clinical Utility

Lastly, accuracy in differential diagnosis seems to be improved with the introduction of ICD-11 CPTSD. In the vignette study of 1738 mental health professionals by Keeley and colleagues (2016) described above, a pair of vignettes presented to clinicians included one with a complex post-traumatic symptom presentation that incorporated the symptoms described by ICD-10 EPCACE and ICD-11 CPTSD and one with only the symptoms of re-experiencing, avoidance and arousal, describing PTSD. Accurate recognition of the complex presentation was substantially higher using the ICD-11 CPTSD than the EPCACE guideline.

Summary

The distinction between PTSD and CPTSD has been supported in several latent class and latent profile analyses demonstrating that the characteristics associated with each disorder are associated with different groups of individuals. The difference between the two disorders seems readily observable to clinicians and accuracy in differential diagnosis is high in a vignette study. Tests of the factor structure of CPTSD symptoms have supported a model that includes two higher-order correlated factors (PTSD and DSO), each measured by 3 first-order symptom clusters. Type of trauma should be conceived of as a risk factor and does not determine whether the person will present with a PTSD or CPTSD profile.

Discussion

The proposed ICD-11 diagnostic requirements for PTSD and CPTSD were the result of an attempt to develop a new international classification for stress- and trauma-related disorders that enhances the clinical utility and applicability of the diagnoses worldwide. In

the formulations of both PTSD and CPTSD, the ICD-11 proposals attempt to simplify the definitions, reduce the number of symptoms, and clarify the differences as well as the relationship between the two disorders. Not surprisingly, the proposals have attracted discussion. One concern is that the lack of harmonization between ICD-11 and DSM-5 will be confusing to persons who receive a PTSD diagnosis, clinicians, researchers, and others (Bisson, 2013). We are sympathetic to this argument but note that ICD is far more widely used worldwide than DSM (Reed, Correia, Esparza, Saxena, & Maj, 2011). Moreover, there are costs, described in more detail below, involved in retaining an imperfect diagnostic structure just because it is in common use.

It has also been argued (Vermetten, Baker, Jetly, & McFarlane, 2016) that divergent diagnostic systems should not produce significantly different prevalence rates or high levels of discordance. The authors suggest that the ICD-11 proposals are incompatible with the advancement of consensus within the field. It seems to us, however, that prevalence rates must depend on an adequate, scientifically-based formulation of the diagnosis, not the other way round. At present PTSD is, and likely will remain, a much debated diagnosis (Brewin, 2003; Hoge, Yehuda, Castro, McFarlane, Vermetten, Jetly et al., 2016; Rosen & Lilienfeld, 2008; Spitzer et al., 2007), a situation which does not argue for remaining loyal to the existing formulation at all costs. It seems to us appropriate that if our understanding of the condition changes, prevalence rates might follow suit.

Likewise, an attempt to avoid any discordant diagnoses runs the risk that we overlook impaired individuals who are not currently receiving a diagnosis under ICD-10, DSM-IV, or DSM-5. The ICD-11 proposals allow us to independently evaluate the reach of these diagnostic systems and, conceivably, to improve our identification of affected individuals. Given the relatively recent introduction of the diagnosis, it is not surprising that a universally

accepted empirical foundation is not yet available for PTSD. We therefore believe it is healthy that alternative diagnostic formulations compete to see which are most clinically useful and able to contribute toward improving the international recognition and treatment of disease.

The lack of complete diagnostic agreement among different systems highlights another important question: whether those PTSD cases that DSM-IV or DSM-5 recognize but that ICD-11 does not would nevertheless meet diagnostic requirements for other conditions, such as major depressive disorder, and would therefore still potentially have access to appropriate treatment. This appears plausible given the very large number of combinations of qualifying symptoms under DSM-IV and DSM-5. Psychotherapy for PTSD shows substantial efficacy but the average effect size of 1.43 for pre- versus post-treatment comparisons indicates that there is plenty of room for improvement, with most patients continuing to have substantial residual symptoms posttreatment (Bradley, Greene, Russ, Dutra, & Westen, 2005; Cusack, Jonas, Forneris, Wines, Sonis, Middleton et al., 2016). In the future it will be important to determine whether outcomes can be improved by targeting comorbid diagnoses as well as, or in some cases instead of, providing trauma-focussed treatment (Rahman, Hamdani, Awan, Bryant, Dawson, Khan et al., 2016).

One other possible implication of the differences in the DSM-5 and ICD-11 descriptions of PTSD concerns how people identified by each diagnosis respond to evidence-based treatments. Most international treatment guidelines recommend trauma-focused cognitive behavior therapy (Institute of Medicine, 2008; National Institute of Clinical Excellence, 2005). These recommendations emerge from many controlled trials that have focused on reliving one's trauma memories. It has been noted by some critics that the move in DSM-5 to shift the diagnosis beyond the fear response to encompass negative moods more

generally may reduce the applicability of this treatment for people identified as suffering PTSD (Hoge et al., 2016). In contrast, it is possible that the ICD-11 requirement of re-experiencing memories will increase the applicability of exposure-based therapy for these individuals.

One of the features of ICD-11 PTSD is the emphasis on re-experiencing in the present. This aspect is not fully captured by existing instruments, which generally make reference only to 'flashbacks'. There has been considerable uncertainty in how to understand this term, with DSM-5 and ICD-11 clarifying for the first time that it is most usefully used to refer to a continuum from severe to mild re-experiencing in the present. Field trials indicate that education about this change is necessary, and more detailed research into the nature of this core re-experiencing symptom and how best to measure it is urgently needed (Brewin, 2015). Among the outstanding issues are whether re-experiencing in the present is a universal aspect of PTSD or whether some trauma types (e.g., childhood sexual abuse) are associated with reliving that differs in intensity, frequency, sensory-perceptual, or other characteristics.

An important next step is to complete the development and testing of interview and self-report measures of the two ICD-11 diagnoses. Measures currently undergoing development include the International Trauma Interview and International Trauma Questionnaire, formerly known as the ICD Trauma Interview (Powers, Fani, Carter, Cross, Cloitre, & Bradley, 2017) and ICD Trauma Questionnaire (Hyland, Shevlin, Brewin, et al., 2017; Karatzias et al., 2016; Murphy et al., 2016). With these measures particular attention is being paid to finalizing the re-experiencing items and the number of symptoms that will describe the CPTSD profile. The symptoms identified in the three clusters of PTSD (usually two per cluster) have been selected from two decades of research in which re-experiencing, avoidance and hyperarousal have been investigated. This is not the case with the symptoms describing disturbances in self-organization, the selection of which has been based on the

research regarding the DESNOS diagnosis. In particular, the role of dissociation needs to be re-considered. Expressed as a type of re-experiencing, dissociation may fall under the PTSD diagnosis. However, when expressed as a type of emotion dysregulation, it might be considered to align with the DSO symptom profile.

Exposure to stressors that are chronic, prolonged, and difficult or impossible to escape from, has been found to be a risk factor rather than an inevitable precursor of CPTSD. It will be important to determine whether chronic traumas that occur in adulthood carry equal risk for CPTSD as those that occur in childhood. Different aspects of CPTSD may be more salient than others depending on the type of stressor. For example, uncontrollable anger tends to have relatively low endorsement as part of the affect dysregulation cluster among adults with childhood sexual and/or physical abuse (Cloitre et al., 2014), but much higher endorsement among those who were exposed to armed conflict and abducted into child soldiering (Murphy et al., 2016). This will need further investigation as research moves towards refining the number and content of the items in the DSO cluster.

Some have suggested that CPTSD be considered a subtype of PTSD rather than an independent diagnosis because CPTSD includes the three PTSD symptom clusters. There are both practical (clinical utility) and conceptual reasons not to do this. Research on clinicians indicate that they tend not to look at or use subtype information (Reed, 2010). Given that CPTSD may be as prevalent as PTSD in some settings, the salience of the diagnosis being considered by the clinician is important. From a conceptual perspective, it is quite possible that the PTSD symptom clusters among those who have CPTSD may differ in their nature, frequency, and intensity. They may contribute less or differently to functional impairment in the context of other symptoms such affect dysregulation or negative self-concept, relative to their expression in PTSD. Defining CPTSD as a disorder separate and distinct from PTSD

will support a conceptualization of the disorder where equal attention is more likely to be given to both DSO and PTSD symptoms in terms of research, assessment, and treatment development and planning.

We hope the diagnosis of CPTSD will reduce diagnostic comorbidity relative to DSM-5. The symptoms proposed in the DSO clusters of CPTSD are frequently observed among those who have experienced chronic trauma but the recognition of such symptoms has been available only through the inclusion of an additional diagnosis. For example, affective dysregulation (e.g., emotional reactivity), negative self-concept (e.g., low self-worth) and interpersonal problems (e.g., fear and avoidance of relationships) have typically been captured by the addition of Borderline Personality Disorder, Dysthymia or Major Depressive Disorder and Social Phobia respectively. The inclusion of such symptoms into the CPTSD profile and symptom clusters is supported by nine latent profile/class analyses and four factor analytic studies. A reduction in comorbidity may be achievable if the symptoms which led to the inclusion of additional "comorbid" diagnoses in order to be accounted for are now identified within the CPTSD diagnosis. In this approach, diagnosis would require an assessment of the relatedness of symptoms to a traumatic event (e.g., symptoms emerge or worsen after event) and use of hierarchical procedures whereby a symptom could only be counted once and contribute once to a single diagnosis. The benefits of limiting diagnosis to one rather than a multiplicity of disorders include simplification in assessment, potential reduction of stigma for the patient, and streamlined treatment.

An important outstanding issue is the impact of developmental issues on the presentation of PTSD and CPTSD symptoms. The data so far are interesting in that distinct PTSD and CPTSD groups have been identified. Moreover, differences in the prevalence rates of PTSD among children and adolescents according to ICD-11 and DSM-IV/5 appear to be

less discrepant than among adult samples, and ICD-11 appears to be uniquely identifying more cases than DSM-IV/5 (Danzi & La Greca, 2016; Haravuori et al., 2016). This may reflect the consensus that PTSD is likely being underdiagnosed in children, at least in part because of the difficulty in identifying avoidance and numbing (Scheeringa, Zeanah, & Cohen, 2011). The absence of numbing symptoms in ICD-11 PTSD may be an advantage in this respect. However, much remains to be learned about how PTSD should be defined and measured in children of different ages.

In conclusion, we believe it is reasonable to diagnose PTSD more simply and to distinguish presentations corresponding to PTSD and CPTSD. Research on four continents has shown that alternative conceptualizations of PTSD are viable in that they identify some individuals, particularly children and adolescents, with approximately equal levels of impairment who are missed by DSM-IV or DSM-5. Moreover, having another formulation of PTSD has generated a lot of research that would otherwise not have been done and that will inform future diagnostic developments. Establishing the value of diagnostic systems is a project without a clear endpoint; one goal is to determine whether the development of different treatment plans (differences in type and number of interventions and duration of treatment) tailored to the symptom profiles described by each disorder may lead to better patient outcomes as well as more efficient use of limited clinician and system resources. We believe that the ICD-11 proposals will assist the identification and treatment of people affected by trauma worldwide.

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Appendix A

Studies Reporting Prevalence, Comorbidity, and Validity of the Proposed ICD-11 PTSD Diagnosis[a] (n = 17)

Study	Sample, gender, country	ICD-11 measure	ICD-10 prevalence	ICD-11 prevalence	DSM-IV prevalence	DSM-5 prevalence	ICD-11 vs. DSM % agreement	Overlap in ICD-11 PTSD cases	Comorbidity
Van Emmerik & Kamphuis (2011)	170 Clinical sample of mixed trauma survivors (62% female, Netherlands)	Estimated from SCID		33%	32%		74%	43%	
Knefel & Lueger-Schuster (2013)	229 Survivors of institutional abuse 23% female, Austria)	Estimated from PCL-C/BSI[1]	53%	38%[2]				Not available	
Morina et al. (2014) sample 1	560 Community sample of war-exposed civilians (75% female, Kosovo)	Estimated from PDS[1]		30%	35%[3]*		87%	68%	MDE lower in ICD-11
Morina et al. (2014) sample 2	142 Military veterans (3% female, UK)	Estimated from SCID		45%	41%		91%	82%	
Stein et al. (2014)	23,936 Community sample of mixed trauma survivors (50% female, 13 countries)	Estimated from CIDI	4%	3%	3%	3%[2]		Not available	Fewer fear and distress disorders in ICD-11
O'Donnell et al.	510 Injury	Estimated from	9%*	3%	6%	7%*	96%	Not available	

(2014)	patients (29% female, Australia)	CAPS					(DSM-5)		
Stammel et al. (2015) sample 1	1075 Community war-exposed sample (62% female, Cambodia)	Estimated from PCL-C[1]		8%	11%*		91%	Not available	Less depression under ICD-11
Stammel et al. (2015) sample 2	453 Community war-exposed sample (58% female, Colombia)	Estimated from PCL-C		44%	55%*		85%	Not available	Less depression under ICD-11
Tay et al. (2015)	230 Refugees (40% female, West Papua)	Culturally adapted measure[1]	13%	6%	13%	12%[2]		Not available	
Hansen et al. (2015)	3746 Survivors of various traumas (71% female, Denmark)	Estimated from HTQ[1]		23%		30%*	82%	Not available	
Hyland et al. (2016)	434 Clinical sample of CSA survivors (85% female, Denmark)	Estimated from HTQ-IV[1]		49%		61%*		Not available	
Glück et al. (2016)	399 Survivors of various traumas aged 60+ (54% female, Austria)	Estimated from PCL-C[1]	15%*	10%			93%	Not available	
Wisco et al (2016) sample 1	2695 National sample with various traumas (52% female, US)	Estimated from NSES	5%[2]	2%	4%[2]	4%*	97% (DSM-5)	Not available	

Wisco et al (2016) sample 2	323 Military veterans (39% female, US)	Estimated from NSES	45%[2]	34%	39%[2]	39%*	88% (DSM-5)	Not available	
Wisco et al (2016) sample 3	745 Military veterans and partners (41% female, US)	Estimated from CAPS	38%	25%	35%[2]			Not available	Less depression under ICD-11
Kliem et al. (2016)	1212 National sample with various traumas (53% female, Germany)	Estimated from PDS		10%	11%			Not available	
Haravuori et al. (2016)	228 students exposed to school shooting (81% female, Finland)	Estimated from K-SADS-PL	37%*	22%	19%		89%	59%	More severe exposure under ICD-11
Sachser & Goldbeck (2016)	124 Clinical sample of children and adolescents with various traumas (72% female, Germany)	Estimated from CAPS-CA	88%*	61%	76%*		65%	Not available	
Danzi & LaGreca (2016) sample 1	327 Pre-adolescents Hurricane Ike (52% female, US)	Estimated from PTSD-RI		11%	13%	13%	88% (DSM-5)	42% (with DSM-5)	Less severe non-core symptoms under ICD-11
Danzi & LaGreca (2016) sample 2	383 Pre-adolescents Hurricane Charley (54%	Estimated from PTSD-RI[1]		9%	10%	7%	93% (DSM-5)	37% (with DSM-5)	Less severe non-core symptoms under ICD-11

	female, US)								
Hafstad et al. (2017) sample 1	325 Young survivors of mass shooting (47% female, Norway)	Estimated from PTSD-RI[1] (model 2)		Wave 1: 10% Wave 2: 6%		Wave 1: 11%[4] Wave 2: 8%*	Wave 1: 94%[5] Wave 2: 97%[5]	Wave 1: 54%[5] Wave 2: 67%[5]	
Hafstad et al. (2017) sample 2	451 Parents of survivors (% female not stated, Norway)	Estimated from PTSD-RI[1] (model 2)		Wave 1: 3% Wave 2: 3%		Wave 1: 6%* Wave 2: 7%*	Wave 1: 96%[5] Wave 2: 96%[5]	Wave 1: 41%[5] Wave 2: 40%[5]	
Walton et al. (2017)	383 Veterans (11% female, US)	Estimated from CAPS-5		59%		79%*	73%	67%	

[a] PTSD cases include an unspecified number of CPTSD cases; [1] Impairment not measured; [2] data for test of correlated proportions not provided; [3] data recalculated using test of correlated proportions; [4] see Corrigendum to article; [5] additional data supplied by the authors; * statistically significant difference to ICD-11 prevalence; CAPS = Clinician Administered PTSD Scale; CAPS-CA = Clinician Administered PTSD Scale for Children and Adolescents; CIDI = Composite International Diagnostic Interview; CSA = child sexual abuse; HTQ = Harvard Trauma Questionnaire; K-SADS-PL = Schedule for Affective Disorders and Schizophrenia for School-Age Children—Present and Lifetime version; NR = not reported; NSES = National Stressful Events Survey; PCL-C = Posttraumatic Stress Disorder Checklist - Civilian Version; PDS = Posttraumatic Diagnostic Scale; PTSD-RI = UCLA PTSD Reaction Index; SCID = Structured Clinical Interview for DSM-IV

Appendix B

Studies Completing Latent Profile/Class Analyses to Assess CPTSD versus PTSD Groups (n=10)

Study	Sample, gender, country	PTSD symptom measure	DSO symptom measure	Result	Class differences by trauma type	Class differences by impairment, demographics and symptoms
Cloitre et al. (2013)	302 Treatment-seeking survivors of interpersonal violence (100% female, USA)	MPSS-SR	BSI	3-class solution with distinct PTSD/CPTSD groups	CPTSD > PTSD: Cumulative childhood abuse, cumulative childhood IPV PTSD > CPTD: 9/11 worst trauma CPTSD & PTSD > Low symptoms: any childhood abuse, any adult IPV, cumulative adult IPV, cumulative lifetime trauma	Greater impairment in CPTSD than PTSD No differences by gender, age, ethnicity or employment status
Cloitre et al. (2014)	310 Treatment-seeking survivors of CPA and/or CSA (100% female, USA)	CAPS-IV	BSI SCID-IV for BPD	4-class solution with distinct PTSD/CPTSD /BPD groups	CPTSD > BPD: Any CSA CPTSD > Low symptoms group: Any CSA No differences across CPTSD, PTSD and BPD on any CA, any adult IPV, cumulative lifetime trauma	Impairment in CPTSD and BPD equivalent and both greater than PTSD
Elklit et al. (2014) sample 1	449 Clinical sample of sexual assault survivors (98% female, Denmark)	HTQ	TSC	3-class solution with distinct PTSD/CPTSD groups	Sample defined by trauma type: 13% in CPTSD class 34% with PTSD profile 53% in Low Symptoms class	Not available
Elklit et al. (2014) sample 2	214 Clinical sample of physical assault survivors (27% female, Denmark)	HTQ	TSC	3-class solution with distinct	Sample defined by trauma type: 21% in CPTSD class	Not available

				PTSD/CPTSD groups	43% with PTSD profile 36% in Low Symptoms class	
Elklit et al. (2014) sample 3	608 Community sample of parents who had lost a child (58% female, Denmark)	HTQ	TSC	3-class solution with distinct PTSD/CPTSD groups	Sample defined by trauma type: 10% in CPTSD class 25% with PTSD profile 64% in Low Symptoms class	Not available
Wolf et al. (2015) sample 1	3,457 Community sample (52% female, USA)	NSES DSM-5 items	NSES DSM-5 CPTSD items	3- and 4-class solutions with distinct PTSD/CPTSD groups using LPA but not with FMM	CPTSD = PTSD: cumulative lifetime sexual assault, cumulative lifetime physical assault	Impairment data not available No differences by gender, age, minority status
Wolf et al. (2015) sample 2	323 Military veterans (39% female, USA)	NSES DSM-5 items	NCSES DSM-5 CPTSD items	3- and 4-class solutions with distinct PTSD/CPTSD using LPA but not with FMM	CPTSD = PTSD: cumulative lifetime sexual assault, cumulative lifetime physical assault	Impairment data not available No differences by gender, age, minority status
Knefel et al. (2015)	229 Community sample of institutional abuse survivors (23% female, Austria)	PCL-C	BSI	4-class solution with distinct PTSD/CPTSD groups	Not available	Impairment data not available Female gender risk factor for CPTSD No gender differences in risk for PTSD
Perkonigg et al. (2016)	3,021 Community sample of young adult survivors of interpersonal violence (42% female,	M-CIDI-DSM-IV	SCL-90-R	4-class solution with distinct PTSD/CPTSD	Not available	Greater impairment in CPTSD than PTSD Female gender risk for CPTSD and PTSD

	Germany)			groups		CPTSD (but not PTSD) associated with younger age, lower education, living alone, lower SES CPTSD more comorbid diagnoses than PTSD
Palic et al. (2016)	820 Clinical and community sample exposed to prolonged interpersonal violence (45% female, Denmark, Israel, Bosnia)	PTSD-I HTQ	SIDS-R/SR	4- and 5-class solutions with distinct PTSD/CPTSD groups	In Denmark CSA most frequently in PTSD group In Israel CSA and POWs, plus in Bosnia refugees, most frequently in CPTSD group	CPTSD highest impairment compared to all other groups Gender differences not Reported
Karatzias et al. (2016)	193 Clinical sample exposed to mixed interpersonal violence (65% female, Scotland)	ICD-TQ	ICD-TQ	2-class solution with distinct PTSD/CPTSD groups	CPTSD > PTSD: CSA, CPA, neglect, emotional abuse, emotional neglect, cumulative childhood abuse trauma, cumulative lifespan trauma	Greater impairment in CPTSD than PTSD No gender differences CPTSD greater likelihood of unemployment, being unmarried, living alone, taking medication
Murphy et al. (2016)	314 Young adults (child soldiers) (51% female, Uganda)	ICD-TQ	ICD-TQ	3-class solution with distinct PTSD/CPTSD	PTSD and CPTSD predicted by child soldier status. CPTSD associated with higher levels of war exposure compared to other two groups	Impairment data not available No gender differences CPTSD had greater anxiety, depression, somatic symptoms, & conduct problems than other two groups

Sachser et al. (2016)	155 Clinical sample of children and adolescents (72% female, Germany)	CAPS-CA	CPCI	2-class solution with distinct PTSD/CPTSD groups	CPTSD group had more interpersonal violence trauma	Impairment data not available Female gender higher in CPTSD; male gender higher in PTSD group No differences in age, living with parent, or parental education

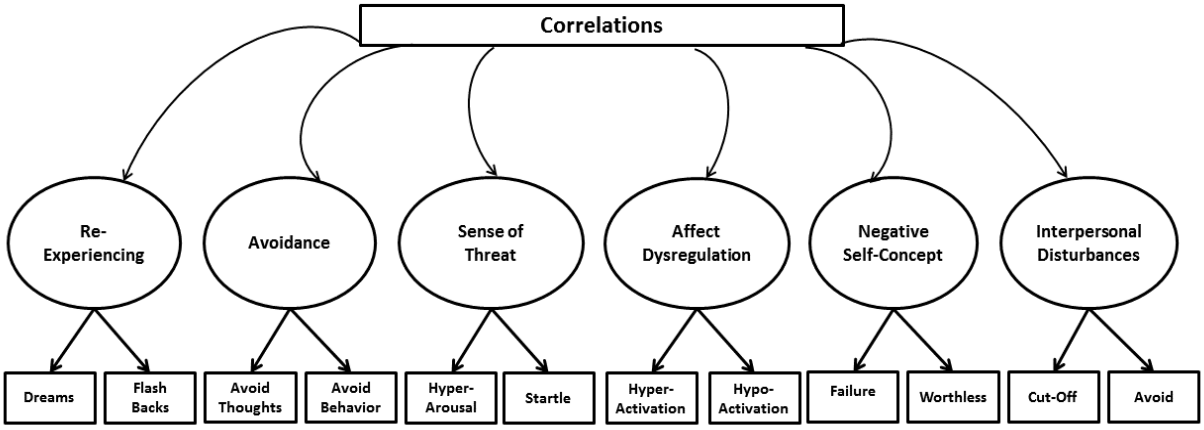
MPSS-SR = Modified PTSD Symptom Scale-Self Report; BSI= Brief Symptom Inventory; IPV = Interpersonal Violence; CAPS-IV = Clinician Administered PTSD Scale for DSM-IV; CPA= childhood physical abuse: CSA= childhood sexual abuse; HTQ = Harvard Trauma Questionnaire; NSES-DSM-5 = National Stressful Events Survey for DSM-5; PCL-C= PTSD Checklist-Civilian Version; M-CIDI = Munich-Composite International Diagnostic Interview for DSM-IV ;SCL-90-R = Symptom Checklist-90- Revised; PTSD-I = Post-traumatic Stress Disorder Inventory ; SIDES-R/SR = Structured Interview for Disorders of Extreme Stress- Revised (Self report) ; CAPS-CA = Clinician Administered PTSD Scale for Children and Adolescents ; CPCI = Child Posttraumatic Cognitions Inventory; TSC = Trauma Symptom Checklist; LPA = latent profile analysis; FMM = factor mixture modeling; POW= prisoner of war; ICD-TQ= ICD-11 Trauma Questionnaire.

Figure Caption

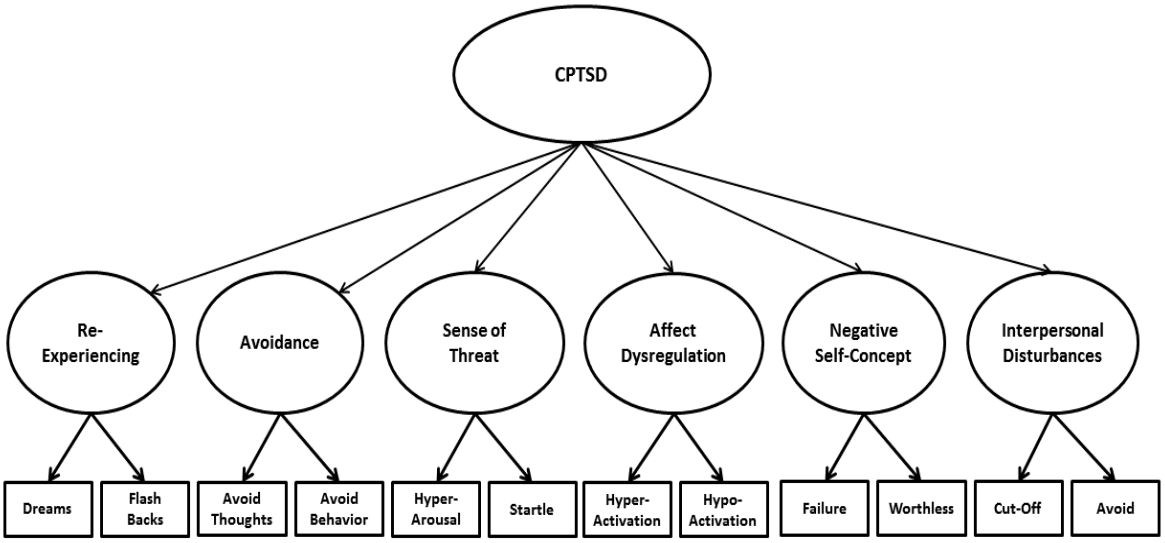
Fig. 1

Three Theoretical Models of CPTSD Factor Structure

CPTSD Model 1: Six Symptom Clusters Correlated with Each Other



CPTSD Model 2: Single Higher Order Factor Model



CPTSD Model 3: Two Factor Higher Order Model