



A comparison of ICD- 11 and DSM-5 criteria for PTSD among a representative sample of Chinese earthquake survivors

Chengqi Cao , Li Wang , Jianhui Wu , Yajie Bi , Haibo Yang , Ruojiao Fang , Gen Li , Ping Liu , Shu Luo , Brian J. Hall & Jon D. Elhai

To cite this article: Chengqi Cao , Li Wang , Jianhui Wu , Yajie Bi , Haibo Yang , Ruojiao Fang , Gen Li , Ping Liu , Shu Luo , Brian J. Hall & Jon D. Elhai (2020) A comparison of ICD- 11 and DSM-5 criteria for PTSD among a representative sample of Chinese earthquake survivors, European Journal of Psychotraumatology, 11:1, 1760481, DOI: [10.1080/20008198.2020.1760481](https://doi.org/10.1080/20008198.2020.1760481)

To link to this article: <https://doi.org/10.1080/20008198.2020.1760481>



© 2020 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.



Published online: 04 Jun 2020.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)



A comparison of ICD- 11 and DSM-5 criteria for PTSD among a representative sample of Chinese earthquake survivors

Chengqi Cao^{a,b}, Li Wang^{b,c}, Jianhui Wu^a, Yajie Bi^{b,c}, Haibo Yang^d, Ruoqiao Fang^{b,c}, Gen Li^{b,c}, Ping Liu^e, Shu Luo^e, Brian J. Hall^{f,g} and Jon D. Elhaj^h

^aCenter for Brain Disorder and Cognitive Science, Shenzhen University, Shenzhen, China; ^bLaboratory for Traumatic Stress Studies, CAS Key Laboratory of Mental Health, Institute of Psychology, Chinese Academy of Sciences, Beijing, China; ^cDepartment of Psychology, University of Chinese Academy of Sciences, Beijing, China; ^dAcademy of Psychology and Behavior, Tianjin Normal University, Tianjin, China; ^eDepartment of Psychosomatics, People's Hospital of Deyang City, Deyang, Sichuan, China; ^fGlobal and Community Mental Health Research Group, Department of Psychology, Faculty of Social Sciences, University of Macau, Taipa, Macau (SAR), China; ^gDepartment of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA; ^hDepartment of Psychology, and Department of Psychiatry, University of Toledo, Toledo, OH, USA

ABSTRACT

Background: Striking differences regarding the diagnosis of PTSD exist between the ICD-11 and DSM-5. This study compared the prevalence and comorbidity of PTSD between the ICD-11 and DSM-5.

Methods: An epidemiological sample of 1160 Chinese adult earthquake survivors collected nine and a half years following the Wenchuan earthquake, in Sichuan province. The PTSD Checklist for DSM-5 (PCL-5), the Patient Health Questionnaire (PHQ-9), and the Generalized Anxiety Disorder-7 (GAD-7) were used to measure PTSD, depression, and anxiety symptoms.

Results: The ICD-11 PTSD criteria yielded higher prevalence estimates than the DSM-5 criteria. There were no significant differences in PTSD's comorbidity with major depressive disorder (MDD) or generalized anxiety disorder (GAD) between the ICD-11 and DSM-5 criteria.

Conclusions: Results found that the ICD-11 and DSM-5 performed differently in assessing PTSD prevalence, but showed similar co-occurrence with MDD and GAD. This study adds to knowledge about the similarities and differences of using different PTSD criteria and carries implications for clinical and research utilization of the two widely used PTSD diagnostic criteria.

Comparación de criterios de la CIE 11 y DSM 5 para TEPT en una muestra representativa de chinos supervivientes a un terremoto

Antecedentes: Existen notables diferencias en relación al diagnóstico de TEPT entre la CIE-11 y el DSM-5. Este estudio comparó la prevalencia y la comorbilidad de TEPT según la CIE-11 y el DSM-5.

Métodos: Una muestra epidemiológica de 1160 chinos adultos supervivientes a un terremoto fue seguida por nueve años y medio posterior al terremoto de Wenchuan, en la provincia Sichuan. Se utilizaron la lista de chequeo de TEPT para el DSM-5 (PCL-5 por sus siglas en inglés), el Cuestionario de Salud del Paciente (PHQ-9 por sus siglas en inglés) y la Ansiedad Generalizada-7 (GAD-7 por sus siglas en inglés) fueron usados para medir TEPT, depresión y síntomas ansiosos.

Resultados: Los criterios de la CIE-11 produjeron mayor prevalencia de TEPT que los criterios del DSM-5. No hubo diferencia significativa en la comorbilidad del TEPT con episodio depresivo mayor (MDD por sus siglas en inglés) o Trastorno de Ansiedad Generalizada (GAD por sus siglas en inglés) entre los criterios de la CIE-10 y el DSM-5.

Conclusiones: Los resultados concluyen que la CIE-11 y el DSM-5 se desempeñaron en forma diferente al evaluar la prevalencia de TEPT, pero mostraron similar co-ocurrencia de MDD y GAD. Este estudio aporta al conocimiento acerca de las similitudes y diferencias al usar diferentes criterios de TEPT, y conlleva implicaciones para el uso clínico y de investigación de dos criterios de TEPT ampliamente utilizados.

中国地震幸存者6837;本中ICD-11和DSM-5 PTSD诊断标准的比较研究

背景: 在最新版的《精神障碍的诊断和统计手册 (DSM)》(第五版) (DSM-5) 和《国际疾病分类》(第十一版) (ICD-11) 诊断标准中, 二者对于创伤后应激障碍 (PTSD) 的诊断标准存在着较大的差别。基于此, 本研究拟分析使用ICD-11和DSM-5中不同的PTSD诊断标准对PTSD发病率以及共病的影响。

方法: 本研究样本使用了亲身经历了四川汶川地震的1160名成人被试样本, 取样时间为地震发生后9.5年。使用PCL-5问卷测定PTSD症状, 使用PHQ-9测定抑郁症状, 使用GAD-7测定焦虑症状。

ARTICLE HISTORY

Received 16 November 2019
Revised 10 March 2020
Accepted 12 March 2020

KEYWORDS

DSM-5; ICD-11;
posttraumatic stress
disorder; prevalence;
comorbidity

PALABRAS CLAVE

DSM-5; CIE-11; Trastorno de
estrés postraumático;
prevalencia; comorbilidad

关键词

《精神障碍的诊断和统计手册 (DSM)》(第五版) (DSM-5); 《国际疾病分类》(第十一版) (ICD-11); 创伤后应激障碍; 发病率; 共病

HIGHLIGHTS

- A greater proportion of participants met criteria for ICD-11 than DSM-5 PTSD.
- ICD-11 and DSM-5 PTSD criteria showed similar co-existing rates with MDD and GAD.

结果: 本研究发现, 相比于DSM-5诊断标准, 使用ICD-11诊断标准产生的PTSD发病率更高。但是比较使用不同诊断标准下PTSD与抑郁和焦虑共病率, 发现并无显著差别。

结论: 使用ICD-11和DSM-5在评估PTSD发生率方面存在差别, 但是使用不同PTSD诊断标准, PTSD与抑郁和焦虑共病率不存在显著差异。本研究的结果增加了使用不同PTSD诊断标准相似性和差异的实证性证据, 对ICD-11和DSM-5 PTSD诊断标准的研究和临床使用具有重要的启示意义。

1. Introduction

Posttraumatic stress disorder (PTSD) is a common mental disorder that can be triggered by traumatic events. The definition and classification of PTSD are mainly based on two systems worldwide: the Diagnostic and Statistical Manual of Mental Disorders (DSM) by the American Psychiatric Association (APA) and the International Classification of Diseases (ICD) by the World Health Organization (WHO). However, striking differences regarding the diagnostic conceptualization of PTSD exist between the latest edition of ICD (ICD-11; WHO, 2018) and DSM (DSM-5; APA, 2013). Specifically, DSM-5 includes 20 PTSD symptoms and requires at least one out of five intrusion symptoms, one out of two avoidance symptoms, two out of seven negative alterations in cognitions and mood symptoms, and two out of six alterations in arousal and reactivity symptoms to diagnose PTSD. In contrast to the broad definition of PTSD in DSM-5, ICD-11 defines PTSD in a narrow way by reducing the ‘non-specific symptoms’ that overlap with symptoms of other mental disorders, which aims at reducing psychiatric comorbidity and improving the clinical utility of the diagnosis (Maercker et al., 2013a). The ICD-11 includes only six PTSD symptoms belonging to intrusion, avoidance, and sense of threat symptom clusters, respectively, and requires at least one out of two intrusion symptoms, one out of two avoidance symptoms, and one out of two sense of threat symptoms. Apart from distinctions about symptoms, there is a ‘sibling disorder’ of PTSD named complex PTSD (CPTSD) in ICD-11 (Maercker et al., 2013b). The symptom profile of CPTSD includes the core PTSD symptoms and plus three additional ‘disturbances in self-organization’ symptom clusters: affective dysregulation, negative self-concept, and disturbances in relationships. CPTSD is typically associated with chronic, repeated, and multiple forms of interpersonal traumas during childhood (e.g. Resick et al., 2012).

Given the significant differences between ICD-11 and DSM-5 in describing PTSD, a number of studies was conducted to compare prevalence and comorbidity using the two systems. Some results demonstrated that DSM-5 criteria yielded a significantly higher prevalence than ICD-11 among adults including injury patients (O’Donnell et al., 2014), pain patients

(Hansen et al., 2017), treatment-seeking survivors of childhood sexual abuse (Hyland et al., 2016), internally displaced people (Shevlin et al., 2018), military veterans (Wisco et al., 2017, 2016), trauma-exposed undergraduates (Hansen et al., 2017), a U.S. national community sample (Wisco et al., 2016) and seven different trauma samples (Hansen, Hyland, Armour, Shevlin, & Elklit, 2015). However, Stein et al. (2014) reported similar prevalence rates in the World Mental Health Surveys using the DSM-5 criteria (3.0%) and ICD-11 criteria (3.2%) (Stein et al., 2014). Notably, some studies found divergence between ICD-11 and DSM-5 in identifying PTSD cases, revealing a substantial proportion of PTSD ‘cases’ from one diagnostic system but not the other (e.g. Hafstad, Thoresen, Wentzel-Larsen, Maercker, & Dyb, 2017; O’Donnell et al., 2014).

Regarding comorbidity differences for PTSD using DSM-5 and ICD-11 criteria, mixed results were reported. Compared with using DSM-5 criteria, several studies found that using ICD-11 criteria could significantly reduce the rate of comorbidity between PTSD and other mental disorders such as major depression disorder (MDD) and generalized anxiety disorder (GAD) (e.g. Hyland et al., 2016; O’Donnell et al., 2014), while other studies showed that the ICD-11 criteria did not reduce comorbidity (e.g. Wisco et al., 2017, 2016). Additionally, a more recent study (Shevlin et al., 2018) reported higher comorbidity using ICD-11 criteria among overlapping samples. However, further analysis in ‘unique’ samples (samples who meet DSM-5 but not ICD-11 criteria and vice versa) indicated higher comorbidity with GAD and lower comorbidity with MDD for ICD-11 PTSD cases in this study. It should be noted that ICD and DSM systems are widely used diagnostic systems. However, all existing studies comparing the two systems were conducted in Western samples. Extensive studies have pointed that cultural variations in the prevalence and presentation of PTSD exists (e.g. Jayawickreme, Jayawickreme, & Foa, 2013; Marques, Robinaugh, LeBlanc, & Hinton, 2011; Yehuda et al., 2015). Therefore, the presentation of ICD-11 and DSM-5 PTSD symptoms might be different in a non-western sample. Studies within non-Western samples would be informative for the utility of the two systems globally.

In the present study, we first investigated the concordance between the DSM-5 and the ICD-11 PTSD

criteria in a sample of adult Chinese earthquake survivors. Subsequently, we further compared co-existing rates between PTSD and two common comorbidities (MDD/GAD) using the two diagnostic systems. Given that this is the first exploratory study to compare these two diagnostic systems in a non-western sample and the mixed results of previous studies, we had no strong a priori hypotheses regarding prevalence and comorbidities.

2. Method and material

2.1. Procedure and participants

The data used in this study were acquired from an epidemiological sample of adult Chinese earthquake survivors (Li et al., 2018). Participants were recruited from five rebuilt communities in Hanwang Town which was almost completely destroyed by the 2008 Wenchuan Earthquake, Sichuan Province, China. The survey was conducted nine and a half years after the earthquake. Households were treated as basic sampling unit, and only one adult member in each household was randomly selected as a participant. Specifically, the household member whose birthday was closest to the date of investigation was first selected for participation, and if the individual was unavailable, the household member whose birthday was the next closest was selected; this procedure continued until a participant was identified. Individuals did not live in the earthquake zone at the time of the earthquake were excluded from participation. Therefore, all participants personally experienced the 2008 Wenchuan earthquake. Individuals with mental retardation or psychosis (e.g. schizophrenia and organic mental disorders) were excluded from participation. Investigators including trained clinical psychologists, psychiatrists, psychotherapists, and psychology graduate students administered self-report questionnaires to consenting participants after providing a detailed introduction of the study. This study was approved by the Institutional Review Board of the Institute of Psychology, Chinese Academy of Sciences. A written informed consent was obtained from all participants.

A total of 1074 people who personally experienced the earthquake was enrolled in the study. Fourteen participants were excluded because of missing data on more than 20% symptom items. The final sample included 1060 adults from 16 to 65 years (Mean = 51.1, SD = 10.0). In this sample, 343 (32.4%) were males and 695 (65.6%) were females. Regarding marital status, 901 (85.0%) were married, 145 (13.7%) were unmarried (single/divorced/separated/widowed). In terms of educational level, 721 (68.1%) did not complete high school education, and 324 (30.6%) completed high school or higher

education. The majority of participants (98.6%) self-reported as Chinese Han ethnicity.

2.2. Measures

Trauma exposure was measured with 10 questions including (1) were you trapped under rubble; (2) Were you injured; (3) Were you disabled due to injuries; (4) Did you participate in rescue efforts; (5) Did you witness a death of someone; (6) Did you see mutilated bodies; (7) Did any family members die in the disaster; (8) Were any family members injured; (9) Did a friend or neighbour die in the disaster; and (10) Did you lose your livelihood due to the disaster. Respondents were instructed to answer yes (1) or no (0) regarding their experiences during the earthquake. The total score of these 10 items was used to reflect the severity of earthquake-related exposure.

PTSD symptoms were assessed with the PTSD Checklist for DSM-5 (PCL-5). The 20-item PCL-5 is rated on a five-point Likert-scale (0 = not at all to 4 = extremely) to reflect the severity of PTSD symptoms referring to the 'Wenchuan Earthquake' during the past month (Blevins, Weathers, Davis, Witte, & Domino, 2015). The Chinese version of the PCL-5 was adapted by a two-stage process of translation and back translation and has been previously used in Chinese populations exposed to traumatic events (Liu, Wang, Cao, Qing, & Armour, 2016; Liu et al., 2014; Wang et al., 2015). Items measuring nightmares, flashbacks, avoidance of thoughts/feelings, avoidance of external reminders, hypervigilance, and exaggerated startle in the PCL-5 were used to correspond with ICD-11 items. Cronbach's α for 20 items for DSM-5 and six items for ICD-11 were 0.95 and 0.90 in this sample, respectively. Symptoms rated at 2 or greater indicated the presence of a symptom. A PTSD diagnosis for ICD and DSM is based on the three symptom criteria of ICD-11 and four symptom criteria for DSM-5 mentioned above, respectively. The DSM-5 and ICD-11 PTSD models were evaluated using confirmatory factor analysis (CFA) performed with Mplus 7.0. Both the DSM-5 model (CFI = 0.951, TLI = 0.944, RMSEA = 0.046 (90% CI: 0.042–0.051), SRMR = 0.037) and the ICD-11 model (CFI = 0.998, TLI = 0.995, RMSEA = 0.022 (90% CI: 0.000–0.049), SRMR = 0.009) yielded adequate fit.

MDD symptoms were assessed with the Patient Health Questionnaire (PHQ-9). The PHQ-9 is a self-report measure rated on a four-point Likert-scale (0 = not at all to 3 = nearly every day) to indicate how often a particular symptom experienced by the respondent in the past 2 weeks (Kroenke, Spitzer, & Williams, 2001). A PHQ-9 summed score of at least 10 represents clinically significant depression symptoms. Cronbach's α for the PHQ-9 was 0.89 in this sample.

GAD symptoms were measured with the Generalized Anxiety Disorder-7 (GAD-7). Items are rated from 0 (not at all) to 3 (nearly every day) to reflect the frequency of a particular symptom during the past 2 weeks. A cut-score of ≥ 10 has been recommended for detecting cases of current GAD (Spitzer, Kroenke, Williams, & Lowe, 2006). Cronbach's α for GAD-7 was 0.93 in this sample.

2.3. Statistical analyses

The CFAs to assess the DSM-5 and ICD-11 PTSD models were performed with Mplus 7.0. All the other statistics were calculated using SPSS 20.0. Missing data were estimated using the expectation maximization algorithm. First, prevalence estimates together with 95% confidence intervals and the patterns of agreement and disagreement of PTSD prevalence using DSM-5 and ICD-11 criteria were computed in this sample (Shevlin et al., 2018). Second, the McNemar's test was used to assess whether there were differences in prevalence across the DSM-5 and ICD-11 diagnostic algorithms. The McNemar's test was chosen for its appropriateness for tests differences in a dichotomous variable between two related groups (Wisco et al., 2016). Third, a z-test was used to compare differences in rates of comorbidity with MDD and GAD between DSM-5 and ICD-11 PTSD (e.g. Hyland et al., 2016).

3. Results

3.1. Prevalence of trauma exposure and PTSD

The mean score on the trauma exposure was 3.6 (SD = 2.0, range: 0–10). A total of 521 (49.2%) participants was exposed to at least four of the traumatic experiences during the earthquake. The prevalence of PTSD symptom clusters using different criteria is presented in Table 1. The prevalence of negative alterations in cognitions and mood symptom cluster in DSM-5 was lowest among all symptom clusters. The rates of PTSD using DSM-5

Table 1. Participants meeting criteria for symptom clusters.

PTSD symptom clusters	<i>n</i>	%
DSM-5		
Intrusion (positive)	629	59.3
Avoidance (positive)	408	38.5
Negative alterations in cognitions and mood (positive)	265	25.0
Alterations in arousal and reactivity (positive)	350	33.9
ICD-11		
Intrusion (positive)	376	35.5
Avoidance (positive)	408	38.5
Sense of threat (positive)	352	33.2

N = 1060. Positive were defined as at least one symptom (2 or higher) for DSM-5 intrusion, DSM-5 avoidance, ICD-11 intrusion, ICD-11 avoidance, and ICD-11 threaten symptom clusters. Positive were defined as at least two symptom (2 or higher) for DSM-5 negative alterations in cognitions and mood and alterations in arousal and reactivity symptom clusters.

and ICD-11 were 15.9% (169 participants; 95% CI = 13.7%–18.2%) and 18.6% (197 participants; 95% CI = 16.2%–21.0%), respectively. McNemar's test indicated that the difference in diagnostic rates according to the two criteria was statistically significant as a significantly greater proportion of earthquake survivors met criteria for ICD-11 than DSM-5 ($\chi^2 = 7.15$, $p = 0.008$, $\phi = 0.08$). When excluding the negative alterations in cognitions and mood symptom cluster and identifying individuals satisfied the remaining three clusters of DSM-5 PTSD, this partial DSM-5 PTSD rate was 23.2% (246 participants) which significantly higher than the original PTSD rate ($z = 4.24$, $p < 0.001$).

3.2. Diagnostic agreement

Results of the patterns of agreement and disagreement between ICD-11 and DSM-5 are presented in Table 2. Of participants classified as probable PTSD cases according to ICD-11, DSM-5, or both, a substantial proportion met one but not the other set of criteria (ICD-11vs DSM-5: 43.6% ($n = 102$) of 234 participants).

3.3. Comorbidity with MDD and GAD

The results of co-occurrence with depression and anxiety using ICD-11 and DSM-5 criteria of PTSD are presented in Table 3. Although comorbidity with

Table 2. Patterns of agreement and disagreement between ICD-11 and DSM-5 PTSD diagnoses in this sample.

	DSM-5 Diagnosis		
	Negative	Positive	Total
ICD-11			
Negative	826(77.9)	37(3.5)	863(81.4)
Positive	65(6.1)	132(12.5)	197(18.6)
Total	891(84.1)	169(15.9)	1060(100.0)

The numbers in front of each cell are the number of participants and the numbers in the parentheses are the percentage of total.

Table 3. Co-occurrence of depression and anxiety for cases meeting criteria for the DSM-5 and ICD-11 PTSD diagnosis.

	Co-occurrence with MDD (%)			Co-occurrence with GAD (%)		
	<i>n</i>	%	95%CI	<i>n</i>	%	95%CI
Comorbidity rates for ICD-11 and DSM-5 PTSD						
DSM-5 PTSD ($n = 169$)	93	55.0	47.6–62.6	72	42.6	35.5–50.0
ICD-11 PTSD ($n = 197$)	96	48.7	42.0–55.3	74	37.6	31.1–43.9
Comorbidity rates for 'unique' cases of ICD-11 and DSM-5 PTSD						
Unique DSM-5 PTSD ($n = 37$)	20	54.1	36.4–71.0	12	32.4	17.2–48.6
Unique ICD-11 PTSD ($n = 65$)	23	35.4	23.5–47.1	14	21.5	12.0–31.7

PTSD: Posttraumatic stress disorder; MDD: major depression disorder; GAD: generalized anxiety disorder.

95% CI: 95% confidence intervals for prevalence rates.

Unique DSM-5 PTSD: individuals who met criteria for PTSD per DSM-5 but not ICD-11.

Unique ICD-11 PTSD: individuals who met criteria for PTSD per ICD-11 but not DSM-5.

MDD and GAD among participants screened as having PTSD using the ICD-11 were lower than using DSM-5, no significant differences found in comorbidity between ICD-11 and DSM-5 (all p values >0.05). We also examined comorbidities among 'unique' cases of PTSD (individuals who met criteria for PTSD per DSM-5 but not ICD-11 or vice versa). No significant differences were found in comorbidity between ICD-11 and DSM-5 (all p value >0.05) for unique cases of PTSD.

4. Discussion

This study compared the prevalence and comorbidity of PTSD defined in ICD-11 and DSM-5 using data from an epidemiological sample of adult Chinese earthquake survivors. Results showed that significantly greater proportion of participants met criteria for ICD-11 than DSM-5 PTSD. Additionally, we found that a substantial proportion of individuals who met ICD-11 PTSD criteria did not meet DSM-5 criteria. In terms of comorbidity of PTSD with MDD/GAD, there were no significant differences between the ICD-11 and DSM-5 criteria.

The ICD-11 criteria identified more PTSD cases than DSM-5, which is inconsistent with previous studies finding the DSM-5 prevalence rate significantly higher than ICD-11 (e.g. Hyland et al., 2016; Shevlin et al., 2018). Previous studies suggest that culture has important impact on victim's prevalence and presentation of PTSD (e.g. Asnaani & Hall-Clark, 2017; Jayawickreme et al., 2013; Marques et al., 2011; Yehuda et al., 2015). For example, the cognitions of PTSD symptoms and prevalence of symptom clusters vary across cultures (Marques et al., 2011). Therefore, the discrepancy may be due to our utilization of a non-Western sample. Regarding the particularity of Chinese culture, previous studies have suggested that Chinese people traditionally tend to attribute their psychological distress to physical origins rather than openly expressing them (e.g. Tang, 2007; Wang et al., 2000), which may lead to the lower frequency of distress symptoms of PTSD. The idea is further supported by the results indicating the lowest prevalence of DSM-5 negative alterations in cognitions and mood symptom cluster and the significantly increased partial PTSD rate after excluding this cluster. Compared with this study, the lowest prevalence of DSM-5 symptom cluster was avoidance symptom cluster (DSM-5 Criterion C) in western countries (e.g. Hafstad, Dyb, Jensen, Steinberg, & Pynoos, 2014; Hoge, Riviere, Wilk, Herrell, & Weathers, 2014). Besides the use of non-western sample, it should be noted that this study did not assess functional impairment. The endorsement of functional impairment criteria may increase the prevalence of negative alterations in cognitions and mood symptom cluster as this symptom cluster was

strongly associated with functional impairment (Meyer et al., 2018; Ross, Murphy, & Armour, 2018). The current finding highlights the necessity of further extensive studies with samples from diverse cultural contexts. Moreover, some previous studies assessed the full range of trauma exposure and queried PTSD symptoms relative to the worst trauma exposure. In contrast, this study assessed the PTSD symptoms referring to the earthquake. The lack of taking influence of multiple traumatization on prevalence rates might also lead to the differences with previous findings.

Apart from the substantial differences between them in terms of prevalence, it should be noted that a substantial proportion of participants in this study met one (e.g. DSM-5) but not the other system (e.g. ICD-11). The concordance between DSM-5 and ICD-11 was lower in this sample than some previous studies (e.g. Shevlin et al., 2018; Wisco et al., 2017). This study did not restricted to meet functional impairment criteria, which may contribute to this results. Despite differences in the prevalence of concordance, these results were generally congruent with previous studies (e.g. Hafstad et al., 2017; O'Donnell et al., 2014) indicating that using different diagnostic systems may influence the identification of PTSD cases both qualitatively and quantitatively. Considering that ICD is the official diagnostic system of the WHO and is used in more countries for clinical practice (Stein & Reed, 2019), while the DSM system is widely used in trauma-related research, large differences across these two diagnostic systems of describing PTSD may increase the barrier between clinical practice and research as they identify distinct sets of individuals. In order to benefit PTSD clinical care globally, extensive efforts should be made to harmonize these two diagnostic systems.

The modifications for ICD-11 aimed at reducing psychiatric comorbidity by eliminating 'non-specific symptoms' of PTSD. However, results of this study showed no substantial reduction of ICD-11 than DSM-5 criteria in comorbidity with MDD and GAD. These results together with previous findings (e.g. Barbano et al., 2019; Elhai, Grubaugh, Kashdan, & Frueh, 2008) indicated that removing overlapping symptoms ICD-11 criteria could not effectively reduce comorbidity. Actually, comorbidity is the rule rather than the exception in mental illness and is widely assumed to reflect the interaction between a limited number of latent traits (Zisner & Beauchaine, 2016) or causal associations among symptoms (Garabiles, Lao, Xiong, & Hall, 2019). Therefore, removing non-specific symptoms, as done with ICD's PTSD criteria, may not able to achieve the original aim (Wisco et al., 2016).

It should be noted that almost all the studies comparing the ICD and DSM criteria of PTSD were

conducted among Western samples. This is the first study to investigate the differences between these two criteria in a non-Western population which supplements existing knowledge. This study has significant implications for research and clinical practice. The higher prevalence of ICD-11 than DSM-5 is inconsistent with previous studies, which may suggest the influence of culture on presentations of disorders. These results have implications in organizing globally applicable ICD-11 criteria that the development of the ICD-11 should take culture into consideration. To address this, the WHO has ensured the influence of culture would be prominently included in revised ICD-11 (Gureje, Lewis-Fernandez, Hall, & Reed, 2019). In addition, clinicians should pay attention to specific symptoms among people with certain cultural backgrounds. For example, the diagnostic assessment of Chinese patients should include greater consideration of somatic symptoms as Chinese tend to present with somatic rather than emotional symptoms (Tang, 2007).

Limitations of this study should be noted. First, we used a measure developed to assess DSM-based PTSD symptoms, which did not correspond precisely to ICD-11 symptoms. The ICD-11 defines intrusions as re-experiencing the traumatic events in the present (Brewin et al., 2017) accompanied by emotions of fear or horror (Hansen et al., 2015) that did not capture by PCL-5. The PCL-5 also did not measure functional impairment and CPTSD symptoms. Moreover, using the same instrument to measure the DSM-5 and ICD-11 PTSD symptoms may also artificially inflate the overlap between the diagnoses and the comorbidity with other diagnoses. Therefore, a standardized measure of ICD-11 PTSD symptoms such as the International Trauma Questionnaire (Cloitre et al., 2018) including the assessment of functional impairment and CPTSD symptoms should be used in future studies. Second, this study used a moderate sized sample suffering from a specific traumatic event and relied on self-reported measures to assess symptoms. Future studies with samples from a range of trauma-exposed populations using interview-based measures should be carried out. Finally, the lifetime measurement for traumatic exposure was not included in this study. Other traumatic life events which may potentially affect PTSD symptoms were not measured or included in analysis.

Notwithstanding these limitations, this study is the first to compare the ICD-11 and DSM-5 criteria for PTSD among Chinese trauma-exposed adults. Results found that ICD-11 and DSM-5 performed differently in assessing the prevalence of PTSD, and showed similar co-existing rates with MDD and GAD. This study adds to knowledge about similarities and differences of using different criteria sets of PTSD and

carries implications for clinical and research utilization of the two widely used diagnostic systems for PTSD.

Acknowledgments

This study was partially supported by the External Cooperation Program of Chinese Academy of Sciences (No. 153111KYSB20160036), the Key Research Program of the Chinese Academy of Sciences (No. ZDRW-XH-2019-4), the National Natural Science Foundation of China (No.31271099, 31471004 and 31771246), the Key Project of Research Base of Humanities and Social Sciences of Ministry of Education (No.16JJD190006), the Beijing Municipal Science and Technology Commission (No. Z171100000117014) and the China Postdoctoral Science Foundation (No. 2018M633141). None of these funding sources had a role in study design, in the collection, analysis, interpretation of data, in writing of the report and in the decision to submit the paper for publication.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by the the External Cooperation Program of Chinese Academy of Sciences [No. 153111KYSB20160036]; the Key Research Program of the Chinese Academy of Sciences [No. ZDRW-XH-2019-4]; the National Natural Science Foundation of China [No.31271099, 31471004]; the National Natural Science Foundation of China [No.31771246]; the China Postdoctoral Science Foundation [No. 2018M633141]; the Beijing Municipal Science and Technology Commission [No. Z171100000117014]; the Key Project of Research Base of Humanities and Social Sciences of Ministry of Education [No.16JJD190006].

ORCID

Li Wang  <http://orcid.org/0000-0002-1459-3412>

Brian J. Hall  <http://orcid.org/0000-0001-9358-2377>

References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5)*. Washington, DC: American Psychiatric Pub.
- Asnaani, A., & Hall-Clark, B. (2017). Recent developments in understanding ethnocultural and race differences in trauma exposure and PTSD. *Current Opinion in Psychology, 14*, 96–101.
- Barbano, A. C., van der Mei, W. F., deRoon-Cassini, T. A., Grauer, E., Lowe, S. R., Matsuoka, Y. J., ... Shalev, A. Y. (2019). Differentiating PTSD from anxiety and depression: Lessons from the ICD-11 PTSD diagnostic criteria. *Depression and Anxiety*, (November 2018), 1–9. doi:10.1002/da.22881
- Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The posttraumatic stress disorder checklist for DSM-5 (PCL-5): Development and

- initial psychometric evaluation. *Journal of Traumatic Stress*, 28, 489–498.
- Brewin, C. R., Cloitre, M., Hyland, P., Shevlin, M., Maercker, A., & Reed, G. M. (2017). A review of current evidence regarding the ICD-11 proposals for diagnosing PTSD and complex PTSD. *Clinical Psychology Review*, 58, 1–15.
- Cloitre, M., Shevlin, M., Brewin, C. R., Bisson, J. I., Roberts, N. P., Maercker, A., ... Hyland, P. (2018). The international trauma questionnaire: Development of a self-report measure of ICD-11 PTSD and complex PTSD. *Acta Psychiatrica Scandinavica*, 138(6), 536–546.
- Elhai, J. D., Grubaugh, A. L., Kashdan, T. B., & Frueh, B. C. (2008). Empirical examination of a proposed refinement to DSM-IV posttraumatic stress disorder symptom criteria using the National Comorbidity Survey Replication data. *Journal of Clinical Psychiatry*, 69(12), 597–602.
- Garabiles, M. R., Lao, C. K., Xiong, Y., & Hall, B. J. (2019). Exploring comorbidity between anxiety and depression among migrant Filipino domestic workers: A network approach. *Journal of Affective Disorders*, 250, 85–93.
- Gureje, O., Lewis-Fernandez, R., Hall, B. J., & Reed, G. (2019). Systematic inclusion of culture-related information in ICD-11. *World Psychiatry*, 18, 357–358.
- Hafstad, G. S., Dyb, G., Jensen, T. K., Steinberg, A. M., & Pynoos, R. S. (2014). PTSD prevalence and symptom structure of DSM-5 criteria in adolescents and young adults surviving the 2011 shooting in Norway. *Journal of Affective Disorders*, 169, 40–46.
- Hafstad, G. S., Thoresen, S., Wentzel-Larsen, T., Maercker, A., & Dyb, G. (2017). PTSD or not PTSD? Comparing the proposed ICD-11 and the DSM-5 PTSD criteria among young survivors of the 2011 Norway attacks and their parents. *Psychological Medicine*, 47(7), 1283–1291.
- Hansen, M., Hyland, P., Armour, C., Shevlin, M., & Elklit, A. (2015). Less is more? Assessing the validity of the ICD-11 model of PTSD across multiple trauma samples. *European Journal of Psychotraumatology*, 6(1), 28766.
- Hansen, M., Hyland, P., Karstoft, K.-I., Vaegter, H. B., Bramsen, R. H., Nielsen, A. B. S., ... Andersen, T. E. (2017). Does size really matter? A multisite study assessing the latent structure of the proposed ICD-11 and DSM-5 diagnostic criteria for PTSD. *European Journal of Psychotraumatology*, 8(sup7), 1398002.
- Hoge, C. W., Riviere, L. A., Wilk, J. E., Herrell, R. K., & Weathers, F. W. (2014). The prevalence of post-traumatic stress disorder (PTSD) in US combat soldiers: A head-to-head comparison of DSM-5 versus DSM-IV-TR symptom criteria with the PTSD checklist. *The Lancet Psychiatry*, 1(4), 269–277.
- Hyland, P., Shevlin, M., McNally, S., Murphy, J., Hansen, M., & Elklit, A. (2016). Exploring differences between the ICD-11 and DSM-5 models of PTSD: Does it matter which model is used? *Journal of Anxiety Disorders*, 37, 48–53.
- Jayawickreme, N., Jayawickreme, E., & Foa, E. B. (2013). Using the individualism-collectivism construct to understand cultural differences in PTSD. In K. Gow & M. Celinski (Eds.), *Natural disaster research, prediction and mitigation. Mass trauma: Impact and recovery issues* (pp. 55–76). Hauppauge: Nova Science Publishers.
- Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, 16(9), 606–613.
- Li, G., Wang, L., Cao, C., Fang, R., Liu, P., Luo, S., ... Elhai, J. D. (2018). DSM-5 posttraumatic stress symptom dimensions and health-related quality of life among Chinese earthquake survivors. *European Journal of Psychotraumatology*, 9(1), 1468710.
- Liu, L., Wang, L., Cao, C., Qing, Y., & Armour, C. (2016). Testing the dimensional structure of DSM-5 posttraumatic stress disorder symptoms in a nonclinical trauma-exposed adolescent sample. *Journal of Child Psychology and Psychiatry*, 57(2), 204–212.
- Liu, P., Wang, L., Cao, C., Wang, R., Zhang, J., Zhang, B., ... Elhai, J. D. (2014). The underlying dimensions of DSM-5 posttraumatic stress disorder symptoms in an epidemiological sample of Chinese earthquake survivors. *Journal of Anxiety Disorders*, 28(4), 345–351.
- Maercker, A., Brewin, C. R., Bryant, R. A., Cloitre, M., Reed, G. M., van Ommeren, M., ... Rousseau, C. (2013b). Proposals for mental disorders specifically associated with stress in the international classification of diseases-11. *The Lancet*, 381(9878), 1683–1685.
- Maercker, A., Brewin, C. R., Bryant, R. A., Cloitre, M., van Ommeren, M., Jones, L. M., ... Somasundaram, D. J. (2013a). Diagnosis and classification of disorders specifically associated with stress: Proposals for ICD-11. *World Psychiatry*, 12(3), 198–206.
- Marques, L., Robinaugh, D. J., LeBlanc, N. J., & Hinton, D. (2011). Cross-cultural variations in the prevalence and presentation of anxiety disorders. *Expert Review of Neurotherapeutics*, 11(2), 313–322.
- Meyer, E. C., Konecky, B., Kimbrel, N. A., DeBeer, B. B., Marx, B. P., Schumm, J., ... Morissette, S. B. (2018). Gender differences in associations between DSM-5 posttraumatic stress disorder symptom clusters and functional impairment in war veterans. *Psychological Services*, 15(2), 230–237.
- O'Donnell, M. L., Alkemade, N., Nickerson, A., Creamer, M., McFarlane, A. C., Silove, D., ... Forbes, D. (2014). Impact of the diagnostic changes to post-traumatic stress disorder for DSM-5 and the proposed changes to ICD-11. *British Journal of Psychiatry*, 205(3), 230–235.
- Resick, P. A., Bovin, M. J., Calloway, A. L., Dick, A. M., King, M. W., Mitchell, K. S., ... Wolf, E. J. (2012). A critical evaluation of the complex PTSD literature: Implications for DSM-5. *Journal of Traumatic Stress*, 25(3), 241–251.
- Ross, J., Murphy, D., & Armour, C. (2018). A network analysis of DSM-5 posttraumatic stress disorder and functional impairment in UK treatment-seeking veterans. *Journal of Anxiety Disorders*, 57, 7–15.
- Shevlin, M., Hyland, P., Vallières, F., Bisson, J., Makhshvili, N., Javakhishvili, J., ... Roberts, B. (2018). A comparison of DSM-5 and ICD-11 PTSD prevalence, comorbidity and disability: An analysis of the Ukrainian internally displaced person's mental health survey. *Acta Psychiatrica Scandinavica*, 137(2), 138–147.
- Spitzer, R. L., Kroenke, K., Williams, J. B., & Lowe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, 166(10), 1092–1097.
- Stein, D. J., McLaughlin, K. A., Koenen, K. C., Atwoli, L., Friedman, M. J., Hill, E. D., ... Kessler, R. C. (2014). DSM-5 and ICD-11 definitions of posttraumatic stress disorder: Investigating “narrow” and “broad” approaches. *Depression and Anxiety*, 31(6), 494–505.
- Stein, D. J., & Reed, G. M. (2019). Global mental health and psychiatric nosology: DSM-5, ICD-11, and RDoC. *Revista Brasileira De Psiquiatria*, 41(1), 3–4.

- Tang, C. S. (2007). Assessment of PTSD and psychiatric comorbidity in contemporary Chinese societies. In J. P. Wilson & C. S. Tang (Eds.), *Cross-cultural assessment of psychological trauma and PTSD. International and cultural psychology series* (pp. 135–136). Boston, MA: Springer.
- Wang, L., Zhang, L., Armour, C., Cao, C., Qing, Y., Zhang, J., ... Fan, G. (2015). Assessing the underlying dimensionality of DSM-5 PTSD symptoms in Chinese adolescents surviving the 2008 Wenchuan earthquake. *Journal of Anxiety Disorders, 31*, 90–97.
- Wang, X., Gao, L., Shinfuku, N., Zhang, H., Zhao, C., & Shen, Y. (2000). Longitudinal study of earthquake-related PTSD in a randomly selected community sample in north China. *American Journal of Psychiatry, 157*(8), 1260–1266.
- Wisco, B. E., Marx, B. P., Miller, M. W., Wolf, E. J., Krystal, J. H., Southwick, S. M., & Pietrzak, R. H. (2017). A comparison of ICD-11 and DSM criteria for posttraumatic stress disorder in two national samples of U.S. military veterans. *Journal of Affective Disorders, 223*(June 2017), 17–19.
- Wisco, B. E., Miller, M. W., Wolf, E. J., Kilpatrick, D., Resnick, H. S., Badour, C. L., ... Friedman, M. J. (2016). The impact of proposed changes to ICD-11 on estimates of PTSD prevalence and comorbidity. *Psychiatry Research, 240*, 226–233.
- World Health Organization. (2018). *ICD-11 for mortality and morbidity statistics*. Geneva, Switzerland: WHO.
- Yehuda, R., Hoge, C. W., McFarlane, A. C., Vermetten, E., Lanius, R. A., Nievergelt, C. M., ... Hyman, S. E. (2015). Post-traumatic stress disorder. *Nature Reviews Disease Primers, 1*(1), 1–22.
- Zisner, A., & Beauchaine, T. P. (2016). Neural substrates of trait impulsivity, anhedonia, and irritability: Mechanisms of heterotypic comorbidity between externalizing disorders and unipolar depression. *Development and Psychopathology, 28*(4pt1), 1177–1208.