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Sub-threshold Post Traumatic Stress Disorder in the WHO World Mental Health Surveys

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Abstract

Background—Although only a minority of people exposed to a traumatic event (TE) develops PTSD, symptoms not meeting full PTSD criteria are common and often clinically significant. Individuals with these symptoms have sometimes been characterized as having *sub-threshold* PTSD, but no consensus exists on the optimal definition of this term. Data from a large cross-national epidemiological survey are used to provide a principled basis for such a definition.

Methods—The WHO World Mental Health (WMH) Surveys administered fully-structured psychiatric diagnostic interviews to community samples in 13 countries containing assessments of PTSD associated with randomly selected TEs. Focusing on the 23,936 respondents reporting lifetime TE exposure, associations of approximated DSM-5 PTSD symptom profiles with six outcomes (distress-impairment, suicidality, comorbid fear-distress disorders, PTSD symptom duration) were examined to investigate implications of different sub-threshold definitions.

Results—Although consistently highest distress-impairment, suicidality, comorbidity, and symptom duration were observed among the 3.0% of respondents with DSM-5 PTSD than other symptom profiles, the additional 3.6% of respondents meeting two or three of DSM-5 Criteria BE also had significantly elevated scores for most outcomes. The proportion of cases with threshold versus sub-threshold PTSD varied depending on TE type, with threshold PTSD more common following interpersonal violence and sub-threshold PTSD more common following events happening to loved ones.

Conclusions—Sub-threshold DSM-5 PTSD is most usefully defined as meeting two or three of the DSM-5 Criteria B-E. Use of a consistent definition is critical to advance understanding of the prevalence, predictors, and clinical significance of sub-threshold PTSD.

Keywords

posttraumatic stress disorder; PTSD; partial PTSD; sub-threshold PTSD; nosology; epidemiology

INTRODUCTION

Although most adults have been exposed to lifetime traumatic events (TEs), only a minority ever meet criteria for PTSD (1, 2). Yet many others develop PTSD symptoms classified as partial or sub-threshold PTSD (3–8). Sub-threshold symptoms are often clinically significant, may require intervention, and are treatable (9, 10). Considerable research exists

on sub-threshold PTSD despite concerns about possible over-diagnosis (11) and secondary gain (12). Most, although not all (6, 13–15), such studies document levels of distress, impairment, suicidality, and comorbidity intermediate between people with PTSD and those with no PTSD symptoms (13, 16–18). However, these studies are inconsistent in definitions of sub-threshold PTSD. The most common definitions are: (i) at least one symptom of each DSM criterion (3–7, 14, 17, 19, 20); (ii) all required symptoms of re-experiencing and one other DSM criterion (5, 19–23); (iii) all required symptoms of re-experiencing and hyper-arousal and at least one avoidance symptom (24, 25); and (iv) all required symptoms of at least one DSM Criterion (26, 27). Because the number of symptom criteria required for a diagnosis has increased from three to four in DSM-5, additional definitions of sub-threshold DSM-5 PTSD are possible.

One consequence of these inconsistent definitions is that lifetime prevalence estimates of sub-threshold PTSD vary widely across studies (10, 28). The few studies that examined multiple definitions argued for creating a consensus definition (23, 29, 30). However, only a handful of studies proposed such a definition (3, 23) and even those few did so based on comparison of only two definitions. The current report presents more comprehensive data on prevalence and correlates of sub-threshold PTSD designed to produce a consensus definition based on data from the WHO World Mental Health (WMH) Surveys.

METHODS AND MATERIALS

Samples

Data come from the 13 surveys in the WMH surveys that assessed PTSD associated with *randomly selected* TEs (31). The 23,936 respondents in these surveys reporting lifetime TE exposure are the focus of analysis. The 13 countries include eight classified by the World Bank (32) as high income (Belgium, Germany, Italy, Japan, Netherlands, New Zealand, Spain, United States), four upper-middle income (São Paulo in Brazil, Bulgaria, Mexico, Romania), and one lower-middle income (Colombia). Most surveys were based on nationally representative household samples, the exceptions being surveys of all urbanized areas in Colombia and Mexico and of specific Metropolitan areas in Brazil (São Paulo) and a series of cities in Japan. Response rates ranged from 55.1 % (Japan) to 87.7% (Colombia). The weighted (by sample size) mean response rate across surveys was 70.3%. More detailed sample descriptions are presented elsewhere (33).

Interviews were administered face-to-face in respondent homes after obtaining informed consent using procedures approved by local Institutional Review Boards. The interview schedule was developed in English and translated into other languages using a standardized WHO translation, back-translation, and harmonization protocol (34). Interviews were in two parts. Part I, administered to all respondents, assessed core DSM-IV mental disorders (n=67,652 respondents across all 13 surveys). Part II assessed additional disorders and correlates. Questions about TEs and PTSD were included in Part II, which was administered to 100% of Part I respondents who met lifetime criteria for any Part I disorder and a probability subsample of other Part I respondents (n=34,321 across all 13 surveys). Part II respondents with no Part I disorder were up-weighted to adjust for under-sampling, resulting in Part II weighted prevalence estimates being identical to Part I estimates. Additional

weights adjusted for differential within and between household selection and deviations between sample and population demographic-geographic distributions. More details about WMH sample design and weighting are presented elsewhere (33).

Measures

Traumatic events (TEs)—WMH assessed lifetime exposure to 29 TEs, including seven war-related (e.g., combatant, civilian in war zone), five types of physical assault (e.g., beaten by caregiver as a child, mugged), three types of sexual assault (e.g., stalked, attempted rape, rape), six involving threats to physical integrity excluding violence (e.g., life-threatening accidents, natural disasters), five involving threats to loved ones (e.g., life-threatening illness/injury), and traumatic death of loved one. Two additional open-ended questions asked about TEs not included on the list and TEs respondents did not wish to describe concretely. Respondents were probed about number of lifetime occurrences and age at first occurrence of each reported TE type.

PTSD—Mental disorders were assessed with the Composite International Diagnostic Interview (CIDI) (35), a fully-structured lay-administered interview yielding DSM-IV diagnoses. PTSD was assessed in relation to one *randomly selected* lifetime TE for each respondent in order to produce a population-level representative sample of TEs (35). Each random TE was weighted by its probability of selection for the respondent, producing a weighted dataset representative of all lifetime TEs occurring to all respondents. The possibility of some TEs being part of linked trauma clusters (e.g., a motor vehicle accident resulting in life-threatening injury to the respondent and death of a loved one) was addressed by probing for such clusters after selecting random TEs and adjusting weights when trauma clusters were reported.

A total of 23,936 Part II respondents (67.1%) reported one or more TEs. Approximately one-fourth (24.6%) of those with TEs reported experiencing exactly one and the others reported a mean of 6.0 (range 2–160; inter-quartile range 3–6). Fifteen percent of random TEs were part of linked trauma clusters. As detailed elsewhere (36), CIDI-SCID concordance for DSM-IV PTSD was moderate (37) ($\kappa=.49$; AUC=.69). However, the proportion of CIDI cases confirmed by the SCID was high (86.1%), meaning that the vast majority CIDI cases would independently be judged to have PTSD by trained clinicians.

Based on preliminary analyses comparing DSM-IV and DSM-5 criteria in an independent sample (detailed results available on request), we used the DSM-IV/CIDI PTSD symptoms assessment in the CIDI to approximate DSM-5 criteria (38) by fully operationalizing DSM-5 Criteria B (one of five symptoms of intrusive recollection), C (one of two symptoms of avoidance), F (duration more than one month), and G (clinically significant distress or impairment), and conservatively operationalizing Criteria D (two of the four symptoms of negative alterations in cognitions and mood assessed in the CIDI, whereas two of seven are required in DSM-5) and E (two of the five symptoms of marked alterations in arousal and reactivity assessed in the CIDI, whereas two of six are required in DSM-5) (Table 1). Our approximation is conservative because it requires the same number of Criterion D and E symptoms as DSM-5 but from smaller sets. Preliminary evaluation of this approximation in

the independent sample mentioned above suggests that it captures over 90% of DSM-5 PTSD cases. Given this high sensitivity in conjunction with perfect specificity, we felt that a focus on approximate DSM-5 criteria was preferable to a focus on DSM-IV criteria in light of the fact that the practical implications of results in the future will be with regard to DSM-5 criteria.

We created four definitions of sub-threshold PTSD to reflect the most commonly used definitions in previous studies and to capture the changes in the number of Criteria and required symptoms within each cluster in DSM-5. These include definitions of sub-threshold PTSD requiring (i) at least one symptom from each of the four DSM-5 Criterion B-E, (ii) full symptoms of 3 Criteria B-E, (iii) full symptoms of 2 Criteria B-E, and (iv) full symptoms of 1 Criteria B-E (Table 1).

Other mental disorders—In addition to PTSD, the CIDI assessed five DSM-IV fear disorders (panic disorder without agoraphobia, specific phobia, social phobia, agoraphobia without history of panic disorder, obsessive compulsive disorder), three distress disorders (major depressive disorder/dysthymia, generalized anxiety disorder, bipolar disorders [I–II and sub-threshold]), three disruptive behavior disorders (oppositional-defiant disorder [ODD], conduct disorder [CD], intermittent explosive disorder), and two substance disorders (alcohol and drug abuse with or without dependence). Age-of-onset of each disorder was assessed using special probing techniques shown experimentally to improve recall accuracy (39). DSM-IV organic exclusion rules and diagnostic hierarchy rules were used (other than for ODD, which was defined with or without CD, and substance abuse, which was defined with or without dependence). As detailed elsewhere (36), generally good concordance was found between these CIDI diagnoses and blinded clinical diagnoses based on clinical reappraisal interviews with the SCID (40).

Outcomes—Six outcomes are considered here: duration of DSM-5 Criterion B-E symptoms of PTSD (coded for symptoms with longest duration to allow comparison of threshold and sub-threshold PTSD); clinically significant distress-impairment associated with these symptoms; severe distress-impairment associated with these symptoms; first lifetime onset of suicidal ideation in conjunction with the focal TE among respondents with no prior history of suicidality; first lifetime onset of the five DSM-IV/CIDI fear disorders in conjunction with the focal TE among respondents with no prior history of these disorders; and first lifetime onset of the four DSM-IV/CIDI distress disorders in conjunction with the focal TE among respondents with no prior history of these disorders.

Predictors—Once a decision was made about how to define sub-threshold PTSD, we examined predictors of threshold PTSD, sub-threshold PTSD, and PTSD symptoms falling short of our sub-threshold definition compared to respondents with no PTSD symptoms. The predictors included respondent sex, age at TE exposure, type of TE, and counts of four types of prior lifetime DSM-IV/CIDI disorders: fear, distress, disruptive behavior, and substance disorders.

Analysis Methods

Prevalence of PTSD symptom profiles was estimated with cross-tabulations. Initial regression analyses focused on associations between number of DSM-5 *symptoms* (0, 1, 2+) within each of the B-E criterion sets and the six outcomes to evaluate, whether each symptom clusters was associated with these outcomes and the implications of the DSM-5 thresholds requiring only one symptom each for Criteria B and C and two symptoms each for Criteria D and E. We then estimated the associations between number of DSM-5 *criteria* (1, 2, 3, and threshold PTSD [4]) and the six outcomes to determine an optimal sub-threshold PTSD definition. Once a preferred definition was obtained, predictors of threshold PTSD, sub-threshold PTSD, and symptomatic response not meeting our criteria for sub-threshold (versus no symptoms) were examined in parallel regression equations.

The regression equations were estimated using a logistic link function at the person level to study predictors of all outcomes other than symptom duration. Discrete-time survival analysis in a logistic regression framework using person-month as the unit of analysis was used to study predictors of symptom duration. Control variables included country, sex, type of TE, and respondent age at occurrence of the focal TE. The analyses predicting comorbid fear and distress disorders focused on first lifetime onset of each such disorder in the year of TE occurrence using a disorder-specific data array that was pooled across the five fear disorders and separately across the three distress disorders. Pooling was used because of the rarity of each comorbid disorder having first onset in the year of TE occurrence. The equations used to predict these comorbid disorders included dummy predictor variables to distinguish the outcome disorders, thereby constraining coefficients to be constant across this range of outcomes. Logistic regression coefficients and their standard errors were exponentiated and are reported as odds-ratios (ORs) with 95% confidence intervals (CIs). Statistical significance was evaluated using .05-level two-sided tests. The design-based Taylor series method (41) implemented in SAS (42) was used to adjust for weighting and clustering.

RESULTS

Prevalence of PTSD symptom profiles

Prevalence of the CIDI approximation of DSM-5 PTSD was 3.0%, while an additional 4.6% of respondents met criteria for at least one definition of sub-threshold PTSD. (Table 2) Prevalence of sub-threshold PTSD was lowest for the definition requiring at least one symptom for each Criterion B-E (0.7%) and highest for the definition requiring full symptoms for at least one of the four Criteria B-E (4.6%). Only a small proportion of respondents (0.2%) reported at least one symptom in Criteria B-E and failed to qualify for any definition of sub-threshold PTSD.

Associations of DSM-5 PTSD Criteria B-E symptoms with the outcomes

Within-criterion symptom-level models found considerable variation across criteria in the associations between symptoms and outcomes. (Table 3) Criterion D symptoms were significantly associated with all six outcomes ($\chi^2_2 = 6.2\text{--}38.3$, $p = .045\text{--}<.001$), Criterion E symptoms with four ($\chi^2_2 = 6.1\text{--}11.2$, $p = .048\text{--}.004$), Criterion B symptoms with two ($\chi^2_2 =$

10.0–10.4, $p = .012-.007$), and Criterion C symptoms with only one outcome ($\chi^2_2 = 8.0$, $p = .018$). The pattern of results for Criteria B (re-experiencing) and C (avoidance) symptoms were consistent with the DSM-5 symptom threshold of 1+ symptom for each of these criteria. For models with globally significant effects of Criteria B-C and at least one individually significant coefficient, ORs associated with 1 symptom (2.2 and 1.4, respectively) were virtually identical to those associated with 2+ symptoms (2.1 and 1.4, respectively). Both ORs in each pair were statistically significant. The results for Criteria D (negative alterations in cognition and mood) and E (hyper-arousal) symptoms were consistent with the DSM-5 symptom threshold of 2+ symptoms. Results for models with globally significant effects of Criteria D-E showed ORs associated with 2+ symptoms (1.7–5.3) to be statistically significant and higher than the insignificant ORs associated with 1 symptom (0.7–2.7) in nine of ten comparisons.

Confounding due to contemporaneous comorbidity

Before concluding that the DSM-5 Criterion B-E symptom thresholds are appropriate, it is important to consider the possibility that the above results are due to uncontrolled contemporaneous comorbidity rather than to sub-threshold PTSD. The analyses in Table 3 were replicated after adding controls for the onset of fear and distress disorders in conjunction with the focal TEs. Results were not affected by introducing these controls, arguing against the suggestion that these results are due to unmeasured comorbidity. (Results are not reported but are available on request.)

Associations of DSM-5 sub-threshold PTSD profiles with the outcomes

Subsequent analyses examined associations of each sub-threshold definition with the outcomes based on dichotomous classifications for whether or not the DSM-5 symptom threshold was met for each Criterion. We did not examine the sub-threshold definition requiring at least one symptom in each Criterion given our results supporting the DSM-5 symptom thresholds and the low prevalence of this definition of sub-threshold PTSD.

A clear gradient was found across the aggregated number-of-criteria profiles for all six outcomes, with the highest outcome scores consistently associated with threshold PTSD, the next highest generally associated with the three-of-four criteria profile (with the exception of clinically significant distress-impairment, which was somewhat higher in the two-of-four profile), and next highest with the two-of-four profiles (with the exception of suicidality, which was higher in the one-of-four profile than in the two-of-four profile). (Table 4) The none-of-four profile, finally, had the lowest scores on all outcomes other than symptom duration. The number of respondents with the none-of-four profile whose symptom duration was estimated (i.e., those with clinically significant symptoms persisting more than one month) was very small ($n = 49$), though, making the estimate of mean duration unstable in this subgroup.

Leaving aside duration because of this instability, differences in all five other outcome scores were statistically significant among respondents with threshold PTSD and three-of-four criteria compared to the none-of-four, for four outcomes among respondents with two-of-four, and for one outcome among respondents with one-of-four. Significance tests

comparing the outcomes of respondents with threshold PTSD versus sub-threshold profiles found three significant differences with the three-of-four profiles (clinically significant and severe distress-impairment and comorbid distress disorders; $\chi^2_1 = 4.0-17.3$, $p = .045-.001$) and four each with the two-of-four (all outcomes other than comorbid fear disorders; $\chi^2_1 = 4.4-27.5$, $p = .036-.001$) and one-of-four (all outcomes other than comorbid fear disorders; $\chi^2_1 = 4.0-39.5$, $p = .045-.001$) profiles.

Differences in outcomes within DSM-5 sub-threshold profiles

The above analyses focused on differences *between* but not *within* the three-of-four, two-of-four, and one-of-four DSM-5 sub-threshold profiles. In order to investigate the latter distinctions, we estimated disaggregated versions of the models in Table 4 to consider different combinations of Criteria within each of the sub-threshold symptom profiles. There are 14 such profiles: four representing three-of-four criteria profiles, six two-of-four criteria profiles, and four one-of-four criteria profiles. The pattern of results from these models did not suggest any specific type or combination of symptoms of particular importance. These results are not presented here but are available upon request.

Predictors of threshold versus sub-threshold PTSD

Based on finding that respondents with two-of-four Criteria B-E exhibit consistently worse outcomes than those with one-of-four Criteria B-E or less, we defined sub-threshold PTSD as meeting at least two-of-four Criteria B-E. A number of interesting similarities and differences were found in the predictors of threshold PTSD, sub-threshold PTSD, and other symptoms of PTSD versus no symptoms among people exposed to TEs. (Table 5) Females had significantly elevated odds of all symptomatic outcomes compared to males ($OR=1.7-3.1$). Prior history of DSM-IV/CIDI fear and distress disorders predicted threshold ($OR=1.7-1.9$) and sub-threshold ($OR=1.5-1.7$) PTSD but not other symptoms of PTSD, whereas prior substance disorder predicted threshold PTSD ($OR=1.4$) but not the other two outcomes. Childhood TE exposure was associated with elevated odds of threshold PTSD ($OR=3.1$) but not the other symptomatic outcomes, while adolescent TE exposure was associated with significantly reduced odds of other symptoms ($OR=0.4$) but not of either threshold or sub-threshold PTSD. TEs involving intimate partner violence and sexual violence were associated with significantly elevated odds (relative to unexpected death of a loved one) of threshold PTSD ($OR=2.6$) but not of the other outcomes, while TEs associated with traumas that occurred to a loved one were associated with significantly reduced relative odds of threshold PTSD ($OR=0.5$) but not of the other outcomes. War-related TEs ($OR=0.3$), accidents ($OR=0.5-0.6$), and “other” TEs ($OR=2.1-2.5$) were associated with significantly reduced relative odds of threshold and sub-threshold PTSD but not of other PTSD symptoms.

DISCUSSION

The data reported here are the first large-scale cross-national data on prevalence and correlates of sub-threshold PTSD and provide the first comprehensive comparison of diverse sub-threshold PTSD definitions. Before commenting on those results, though, it is noteworthy that the associations between DSM-5 Criteria B-E symptom counts and the

outcomes considered here generally supported the DSM-5 thresholds of one symptom each for Criteria B (re-experiencing) and C (avoidance) and each for Criteria D (negative alterations in cognition and mood) and E (hyper-arousal). A question could be raised, though, whether our use of a conservative approximation of DSM-5 criteria biased the data on which this result is based. We believe not, as the independent comparison of diagnoses based on our approximation with diagnoses based on full DSM-5 criteria that was mentioned in the section on measures suggests that any such bias was minimal (i.e., more than 90% of DSM-5 cases captured by our approximation). This means that the symptoms added in DMS-5 are much less common than those already in DSM-IV, leading to the number of people having the new symptoms in the absence of the DSM-IV symptoms being small. The criterion-level thresholds considered here consequently should be good approximations of DSM-5 thresholds, bolstering the validity of our empirical support for the DSM-5 thresholds.

As expected, we found threshold DSM-5 PTSD associated with distress-impairment, and comorbidity at levels generally higher than sub-threshold PTSD. This result is broadly consistent with previous studies (3, 4, 7, 25, 43). However, the main focus of the paper was on alternative sub-threshold symptom profiles. We found that the sub-threshold profiles requiring two or three Criteria B-E were clearly more associated with more adverse outcomes than those associated with one-of-four Criteria B-E, leading us to recommend that future epidemiological studies define sub-threshold DSM-5 PTSD as meeting two or three Criteria B-E.

It is noteworthy that our proposed definition focuses only on *number* of DSM-5 PTSD criteria, while previous studies made distinctions regarding specific symptoms, most notably regarding the particular importance of avoidance (23), re-experiencing (5), and hyper-arousal (20). We found no evidence for special importance of these or other specific symptoms. It is also noteworthy that wide variation was found in prevalence estimates of sub-threshold PTSD across the range of definitions proposed in the literature, demonstrating that it is important to have a consensus definition to avoid wide variation in estimates of prevalence and correlates. Use of such a consistent definition could also promote the accumulation of data allowing valid comparisons of prevalence, predictors, and markers of clinical significance. Such evidence might subsequently lead to the inclusion of a diagnosis of sub-threshold PTSD or stress-related adjustment disorder in future DSM editions (44).

When using our preferred definition of sub-threshold PTSD the proportion of people exposed to TEs classified as having sub-threshold DSM-5 PTSD (3.6%, see Table 2) is roughly comparable to the proportion classified as having threshold PTSD (3.0%). Although this finding is generally consistent with other studies (3, 14, 29), our additional finding of significant differences in relative prevalence of threshold versus sub-threshold prevalence across TE types shows that this comparability will vary depending on the types of TEs under study.

The above results need to be interpreted in the context of three limitations in the WMH assessment of PTSD, all of which would be expected to introduce a conservative bias into the designation of respondents as having threshold DSM-5 PTSD: that the assessment was

based on a conservative approximation of DSM-5 criteria; that it was made using a fully-structured lay interview rather than a semi-structured clinical interview; and that focal TEs were selected randomly from all the TEs respondents ever experienced rather than from the TEs nominated by respondents as their worst.

As noted above, we reckon that the conservative bias associated with using DSM-IV symptom measures to approximate DSM-5 criteria reduced the prevalence estimate of DSM-5 PTSD by less than 10% of that estimate (i.e. true DSM-5 prevalence might have been 3.3% compared to the 3.0% estimated with our approximation). The conservative bias associated with using the fully-structured CIDI was noted in the section on measures, where we reported that the vast majority of CIDI cases were confirmed in blinded SCID clinical reappraisal interviews while the SCID also found additional cases that were missed by the CIDI. The conservative bias associated with the focus on randomly selected TEs, in comparison, was not mentioned in the section on measures. This bias relates to the fact that roughly 15% of respondents reported that their randomly selected TE was part of a linked trauma cluster. If the random TE was not the central trauma in the cluster (e.g., the random TE was a motor vehicle accident, whereas the linked trauma that caused the PTSD was the death of a loved one in that accident) and if the respondent answered the symptom questions with a narrow focus on the random TE rather than on the entire cluster (e.g., nightmares about the crash rather than about the death) the presence of symptoms associated with the linked TE might not have been reported, leading to a conservative bias in estimating threshold PTSD.

These conservative biases almost certainly led to an under-estimation of the prevalence of threshold DSM-5 PTSD. It is less clear, though, whether they increased or decreased the estimated prevalence of sub-threshold PTSD or the odds-ratios reported here, as the incorrect classification of true threshold cases as sub-threshold would increase estimated sub-threshold prevalence and severity while the incorrect classification of true sub-threshold cases as asymptomatic would reduce estimated sub-threshold prevalence and severity. More fine-grained assessments than those in the WMH surveys would be needed to determine the relative importance of these competing types of bias and, with it, the possibility that a more valid definition of sub-threshold PTSD exists than the definition proposed here. Prior to the time when such data are available, we suggest that our proposed definition be used as a way to systematize comparisons across existing datasets and to provide a starting point for the evaluation of more nuanced definitions in new studies collecting more nuanced data.

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Table 1**DSM-5 PTSD Criteria and Definitions of Sub-threshold PTSD**

DSM-5 PTSD Criteria	Symptoms Required^a
A. Exposure to actual or threatened death, serious injury, or sexual violence	
B. Re-experiencing	1 of 4
C. Avoidance	1 of 2
D. Negative alterations in cognition and mood	2 of 7
E. Hyper-arousal	2 of 6
F. Duration of at least one month	
G. Clinically significant distress/impairment	
H. Symptoms not due to physiological effects of a substance or medical condition	

Sub-threshold PTSD Definitions	Definition
1. One or more symptoms of each Criterion B-E	1+ symptom in each of the 4 Criteria B-E
2. Three of four Criteria B-E	Exactly 3 of 4 Criteria B-E
3. Two of four Criteria B-E	Exactly 2 of 4 Criteria B-E
4. One of four Criteria B-E	Exactly 1 of 4 Criteria B-E

^aThe number of symptoms required to meet each Criterion is listed only for Criteria B-E. The full list of symptoms that comprise each of these Criteria can be found in the DSM-5.

Table 2

Distribution of Threshold and Sub-Threshold DSM-5/CIDI PTSD Symptom Profiles in the WMH Representative Sample of Traumatic Events

	%	(se)	(n) ^a
I. Threshold PTSD	3.0	(0.2)	(835)
II. Sub-threshold			
One or more symptoms of each Criterion B-E	0.7	(0.1)	(248)
Three of the four Criteria B-E	1.8	(0.1)	(621)
Two of the four Criteria B-E	1.7	(0.4)	(1,085)
One of the four Criteria B-E	4.6	(0.5)	(1,413)
Any sub-threshold	4.6	(0.5)	(1,413)
III. Others with any Criterion B-E symptoms	0.2	(0.1)	(49)
IV. No symptoms	92.2	(0.5)	(21,639)
V. Total	100.0		(23,936)

DSM, Diagnostic and Statistical Manual of Mental Disorders; CIDI, Composite International Diagnostic Interview; WMH, World Mental Health; PTSD, post-traumatic stress disorder

^a Sample sizes reported are the numbers of respondents in the numerators. The denominator for all calculations is 23,936.

Table 3

Associations (Odds-Ratios) of Symptom Counts Across DSM-5/CIDI PTSD Criteria B-E with a Range of Outcomes in the WMH Sample of Randomly Selected Traumatic Events (TEs)^a

Distress-Impairment						Suicidal Ideation ^d			Comorbid Disorders					Symptom Duration ^f				
Clinically Significant ^b			Severe ^c			%	OR	(95% CI)	%	OR	(95% CI)	%	OR	(95% CI)	Mean Duration	OR	(95% CI)	
%	OR	(95% CI)	%	OR	(95% CI)													
I. Criterion B. Intrusive recollections																		
2+	93.1	2.1	(1.0–4.5)	78.2	2.1*	(1.3–3.4)	5.2	1.1	(0.5–2.1)	1.4	2.3	(1.0–5.2)	3.9	1.1	(0.6–1.9)	89.9	0.9	(0.7–1.4)
1	86.1	1.6	(0.6–4.4)	68.1	2.2*	(1.0–4.8)	3.6	1.5	(0.6–4.1)	0.1	0.4	(0.1–2.2)	3.9	1.7	(0.6–5.0)	66.2	1.1	(0.7–1.7)
0	84.0	1.0	--	54.4	1.0	--	1.2	1.0	--	0.3	1.0	--	0.6	1.0	--	70.2	1.0	--
χ^2_2		3.9			10.4*			0.8			10.0*, †			1.1		0.4		
II. Criterion C. Avoidance																		
2+	96.1	2.7*	(1.1–6.5)	75.8	0.7	(0.4–1.3)	5.4	0.6	(0.2–1.4)	1.7	0.7	(0.2–1.8)	4.0	0.8	(0.4–1.4)	103.1	1.4*	(1.1–2.0)
1	91.9	1.4	(0.7–3.1)	75.7	1.1	(0.6–2.0)	4.7	0.6	(0.2–1.8)	0.7	0.4	(0.2–1.1)	3.7	0.9	(0.4–1.7)	90.2	1.4*	(1.1–1.9)
0	82.9	1.0	--	66.1	1.0	--	1.2	1.0	--	0.3	1.0	--	0.7	1.0	--	52.0	1.0	--
χ^2_2		5.2			2.4			1.6			3.7			0.9		8.0*		
III. Criterion D. Cognitions-mood																		
2+	96.5	2.5*	(1.1–5.8)	85.2	4.2*	(2.4–7.1)	7.7	5.3*	(2.3–11.9)	1.8	3.9*	(1.5–10.3)	5.3	2.9*	(1.4–6.0)	106.5	1.7*	(1.2–2.0)
1	92.5	1.7	(0.9–3.3)	55.4	0.9	(0.5–1.7)	1.0	0.7	(0.2–2.4)	0.8	2.7	(0.7–9.8)	1.8	0.9	(0.4–2.2)	81.1	1.3	(0.9–1.7)
0	81.7	1.0	--	60.9	1.0	--	1.2	1.0	--	0.3	1.0	--	0.6	1.0	--	49.1	1.0	--
χ^2_2		6.2*			38.3*			24.8*			8.2 ^c			28.9*		10.9*		
IV. Criterion E. Arousal-reactivity																		
2+	95.0	5.0*	(1.5–16.1)	77.6	2.3*	(1.3–4.3)	5.2	1.5	(0.6–3.6)	1.3	1.0	(0.5–2.2)	4.2	3.3*	(1.6–6.8)	90.1	1.4	(0.9–2.0)
1	79.3	1.9	(0.6–6.1)	55.0	1.1	(0.5–2.8)	2.2	1.2	(0.4–4.1)	0.2	0.3	(0.1–1.3)	1.8	1.7	(0.9–3.6)	53.0	1.7*	(1.1–2.6)
0	76.0	1.0	--	54.1	1.0	--	1.2	1.0	--	0.3	1.0	--	0.6	1.0	--	67.6	1.0	--
χ^2_2		7.8*			10.9*			0.8			3.2			11.2*		6.1*		
χ^2_8		41.8*			72.3*			55.7*			48.8*			152.3*		34.0*		
(n)		(2,499) ^b			(2,297) ^c			(22,030) ^d			(23,936) ^e			(23,908) ^e		(2,297) ^f		

DSM, Diagnostic and Statistical Manual of Mental Disorders; CIDI, Composite International Diagnostic Interview; PTSD, post-traumatic stress disorder; WMH, World Mental Health; TE, traumatic event; OR, odds ratio; CI, confidence interval

* Significantly different from respondents with no symptoms of the criterion at the .05 level, two-sided test.

[†] The coefficients are significant as a pair even though neither OR is individually significant. This occurs because there is a significant difference between the insignificantly elevated OR for 2+ symptoms and the insignificantly reduced OR for 1 symptom.

^a See the section on Analysis Methods in the text for a description of the regression models.

^b The sample is limited to cases where the respondent reported one or more symptoms of at least one Criterion B-E lasting more than one month, as clinically significant distress and impairment were assessed only when at least one such symptom was reported.

^c The sample is limited to cases where the respondent reported one or more symptoms of at least one Criterion B-E lasting more than one month and reported clinically significant distress or impairment associated with this/these symptom(s), as severe distress and impairment were assessed only in this sub-sample. Note that the outcome of severe distress-impairment is conditionally independent of the outcome of serious distress-impairment because all respondents in the sample used to predict severe distress-impairment reported significant distress-impairment.

^d The sample is limited to cases where the respondent did not have a lifetime history of suicidal ideation prior to age of occurrence of the TE, as first lifetime onset of suicidal ideation is the outcome. Presence of clinically significant distress or impairment associated with the TE was not required in defining this sample, but Criteria B-E symptoms were classified as present in defining the predictors only if the respondent reported clinically significant distress or impairment associated with these symptoms.

^e The ORs reported here are pooled across disorder-specific equations for each of the fear and each of the distress disorders assessed in the surveys. The % estimates are averages across those pooled equations. Presence of clinically significant distress or impairment associated with the TE was not required in defining these samples, but Criterion B-E symptoms were classified as present in defining the predictors only if the respondent reported clinically significant distress or impairment associated with these symptoms. The 23,936 respondents included in the pooled person-disorder data array for the five fear disorders resulted in 112,460 observations, and the 23,908 respondents included in the pooled person-disorder data array for mood disorders resulted in 79,836 observations

^f The sample is limited to cases where the respondent reported one or more symptoms of at least one Criterion B-E symptom lasting more than one month and reported clinically significant distress or impairment associated with this/these symptom(s), as these are the cases for which symptom duration was assessed. The predictors of symptom duration are estimated in a discrete-time survival framework with person-month the unit of analysis. Duration was censored at 60 months if symptoms persisted longer than 60 months in order to reduce the effects of extreme outliers. A total of 71,304 person-months were included in the analysis.

Table 4

Associations (Odds-Ratios) of Different Definitions of DSM-5 Sub-Threshold PTSD with a Range of Outcomes in the WMH Sample of Randomly Selected Traumatic Events (TEs)^a

	Distress-Impairment				Suicidal Ideation ^d				Comorbid Disorders				Symptom Duration ^f	
	Clinically significant ^b		Severe ^c						Fear ^e		Distress ^e			
	%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)	Mean Duration	OR (95% CI)
I. Threshold PTSD	98.0 ^g	26.9 ^{*g}	87.6	22.3 [*]	8.2	5.4 [*]	2.0	5.5 [*]	5.5	8.6 [*]	117.0	2.0	117.0	(1.0–3.6)
II. Three of Criteria B-E	93.4	8.6 [*]	70.4	6.8 [*]	3.6	2.3 [*]	0.9	2.6 [*]	3.6	4.9 [*]	82.3	1.7	82.3	(0.8–3.2)
III. Two of Criteria B-E	92.9	9.7 [*]	69.4	5.4 [*]	1.4	1.0	0.5	2.8 [*]	1.9	3.0 [*]	47.3	1.1	47.3	(0.6–2.2)
IV. One of Criteria B-E	72.7	1.4	47.6	2.3	2.3	1.5	0.5	2.2	1.9	2.9 [*]	58.9	0.9	58.9	(0.4–1.9)
V. None of Criteria B-E	68.0	1.0	30.7	1.0	1.2	1.0	0.3	1.0	0.6	1.0	69.1	1.0	69.1	--
VI. Total	90.7		72.8		1.4		0.4		0.8		84.4		84.4	
(n)		(2,499) ^b		(2,297) ^c		(22,030) ^d		(23,936) ^e		(23,908) ^e				(2,297) ^f

DSM, Diagnostic and Statistical Manual of Mental Disorders; CID-I, Composite International Diagnostic Interview; PTSD, post-traumatic stress disorder; WMH, World Mental Health; TE, traumatic event; OR, odds ratio; CI, confidence interval

^a Significantly different from respondents with no Criteria B-E at the .05 level, two-sided test.

^b See the section on Analysis Methods in the text for a description of the regression models.

^c The sample is limited to cases where the respondent reported one or more symptoms of at least one Criterion B-E lasting more than one month, as clinically significant distress and impairment were assessed only when at least one such symptom was reported.

^d The sample is limited to cases where the respondent reported one or more symptoms of at least one Criterion B-E lasting more than one month and reported clinically significant distress or impairment associated with this/these symptom(s), as severe distress and impairment were assessed only in this sub-sample. Note that the outcome of severe distress-impairment is conditionally independent of the outcome of serious distress-impairment because all respondents in the sample used to predict severe distress-impairment reported clinically significant distress-impairment.

^e The sample is limited to cases where the respondent did not have a lifetime history of suicidal ideation prior to age of occurrence of the TE, as first lifetime onset of suicidal ideation is the outcome. Presence of clinically significant distress or impairment associated with the TE was not required in defining this sample, but Criteria B-E symptoms were classified as present in defining the predictors only if the respondent reported clinically significant distress or impairment associated with these symptoms.

^f The ORs reported here are pooled across disorder-specific equations for each of the fear and each of the distress disorders assessed in the surveys. The % estimates are averages across those pooled equations. Presence of clinically significant distress or impairment associated with the TE was not required in defining these samples, but Criteria B-E symptoms were classified as present in defining the

predictors only if the respondent reported clinically significant distress or impairment associated with these symptoms. The 23,936 respondents included in the pooled person-disorder data array for the five fear disorders resulted in 112,460 observations, and the 23,908 respondents included in the pooled person-disorder data array for mood disorders resulted in 79,836 observations.

^fThe sample is limited to cases where the respondent reported one or more symptoms of at least one Criterion B-E symptom lasting more than one month and reported clinically significant distress or impairment associated with this/these symptom(s), as these are the cases for which symptom duration was assessed. The predictors of symptom duration are estimated in a discrete-time survival framework with person-month the unit of analysis. Duration was censored at 60 months if symptoms persisted longer than 60 months in order to reduce the effects of extreme outliers. A total of 71,304 person-months were included in the analysis.

^gThe requirement of clinically significant distress or impairment was not operationalized in defining threshold cases for this outcome, as this would have led to 100% of cases having the outcome and making it impossible to include them in the regression equation.

Table 5

Associations (Odds-Ratios) of Socio-Demographics, Temporally Prior Mental Disorders, and Characteristics of Traumatic Experiences with DSM-5/CIDI PTSD, Sub-Threshold PTSD, and PTSD Symptoms in the WMH Representative Sample of Traumatic Experiences (TEs)^a

	Threshold PTSD		Sub-threshold ^b		Others with Symptoms ^c	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Sex						
Female	1.7*	(1.1–2.6)	2.6*	(1.6–4.2)	1.8*	(1.1–3.1)
Male	1.0	--	1.0	--	1.0	--
χ^2_1	5.5*		15.1*		5.0*	
Prior mental disorders^d						
Fear Disorders	1.9*	(1.7–2.2)	1.5*	(1.3–1.8)	1.2	(0.9–1.7)
Distress Disorders	1.7*	(1.4–2.0)	1.5*~	(1.2–1.9)	1.0	(0.7–1.4)
Substance Disorders	1.4*	(1.0–1.8)	1.3~	(0.9–2.0)	0.7	(0.4–1.3)
Behavior Disorders	1.1	(0.8–1.6)	0.8~	(0.5–1.5)	1.9*	(1.0–3.5)
χ^2_3	190.6*		35.9*		7.4	
Age of TE exposure						
0–12	3.1*	(1.4–6.5)	1.0	(0.8–4.0)	0.4	(0.1–1.4)
13–19	1.2	(0.5–2.6)	1.2	(0.5–2.1)	0.4*	(0.2–0.9)
20–29	1.3	(0.7–2.3)	1.1	(0.7–2.3)	0.5	(0.2–1.1)
30–44	0.9	(0.5–1.7)	1.0	(0.7–1.8)	1.1	(0.5–2.2)
45+ years	1.0	--	1.0	--	1.0	--
χ^2_4	24.6*		5.8		11.1*	
Type of TE						
War-related Events	0.3*	(0.2–0.7)	0.3*	(0.2–0.6)	1.0	(0.4–2.8)
Other Interpersonal Violence	0.7	(0.4–1.2)	0.9	(0.5–1.5)	0.6	(0.4–1.2)
Intimate/Sexual Violence	2.6*†	(1.7–4.0)	1.2	(0.7–1.9)	1.5	(0.6–3.3)
Accidents	0.5*	(0.3–0.8)	0.6*	(0.4–0.9)	1.0	(0.5–1.8)
Death of loved one (ref)	1.0	--	1.0	--	1.0	--

	Threshold PTSD		Sub-threshold ^b		Others with Symptoms ^c	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Other events to loved ones	0.5 ^{*†}	(0.3–0.8)	1.1	(0.7–1.9)	0.7	(0.4–1.3)
Other	2.1 [*]	(1.3–3.3)	2.5 [*]	(1.6–4.0)	3.1	(0.9–10.5)
χ^2_6	86.9 [*]		53.9 [*]		8.0	
(n)	(22,474)		(22,742)		(22,016)	

DSM, Diagnostic and Statistical Manual of Mental Disorders; PTSD, post-traumatic stress disorder; WMH, World Mental Health; TE, traumatic event; OR, odds ratio; CI, confidence interval

^{*} Significant at the .05 level, two-sided test.

[†] Significant difference between the ORs for threshold and sub-threshold DSM-5 PTSD.

[~] Significant difference between the ORs for sub-threshold DSM-5 PTSD and some Criterion B-E symptoms.

^a Based on logistic regression analysis controlling for country income group, marital status and education at the time of the random TE, and TEs occurring prior to the random TE, with the reference group equaling respondents with a random TE who did not have any Criterion B-E symptoms lasting at least one month.

^b Sub-threshold cases include all respondents meeting criteria for at least two-of-four Criteria B-E.

^c Includes all respondents with one or more Criterion B-E symptoms lasting at least one month but not meeting criteria for threshold or sub-threshold DSM-5 PTSD.

^d Prior mental disorder variables represent counts of fear, distress, substance, and behavior disorders with onsets prior to the occurrence of the random TE.