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Dissociation in Posttraumatic Stress Disorder: Evidence from the World Mental Health Surveys

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Abstract

Background—Although the proposal for a dissociative subtype of posttraumatic stress disorder (PTSD) in DSM-5 is supported by considerable clinical and neurobiological evidence, this

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evidence comes mostly from referred samples in Western countries. Cross-national population epidemiologic surveys were analyzed to evaluate generalizability of the subtype in more diverse samples.

Methods—Interviews were administered to 25,018 respondents in 16 countries in the World Health Organization World Mental Health Surveys. The Composite International Diagnostic Interview was used to assess 12-month DSM-IV PTSD and other common DSM-IV disorders. Items from a checklist of past-month nonspecific psychological distress were used to assess dissociative symptoms of depersonalization and derealization. Differences between PTSD with and without these dissociative symptoms were examined across a variety of domains, including index trauma characteristics, prior trauma history, childhood adversity, sociodemographic characteristics, psychiatric comorbidity, functional impairment, and treatment seeking.

Results—Dissociative symptoms were present in 14.4% of respondents with 12-month DSM-IV/Composite International Diagnostic Interview PTSD and did not differ between high and low/middle income countries. Symptoms of dissociation in PTSD were associated with high counts of re-experiencing symptoms and net of these symptom counts with male sex, childhood onset of PTSD, high exposure to prior (to the onset of PTSD) traumatic events and childhood adversities, prior histories of separation anxiety disorder and specific phobia, severe role impairment, and suicidality.

Conclusion—These results provide community epidemiologic data documenting the value of the dissociative subtype in distinguishing a meaningful proportion of severe and impairing cases of PTSD that have distinct correlates across a diverse set of countries.

Keywords

Dissociation; dissociative subtype; DSM-5; epidemiology; nosology; posttraumatic stress disorder; World Mental Health Surveys

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For over a century, clinicians have observed a wide range of dissociative phenomena in trauma survivors, such as affect compartmentalization, disrupted memory encoding, and time distortion and fugue (1,2). Yet, only two dissociative symptoms, flashbacks and psychogenic amnesia, are included in the DSM-IV diagnostic criteria for posttraumatic stress disorder (PTSD) (3). A proposal has been made to include a dissociative subtype of PTSD in the forthcoming DSM-5 revision (http://www.dsm5.org/ProposedRevisions/Pages/proposedrevision.aspx?rid=165). One important basis for this proposal is concern that some PTSD patients experience dissociative symptoms not in DSM-IV, which, if recognized, could improve appropriate diagnosis and treatment (4–7). Another important basis for the proposal is the observation that some people with PTSD respond to trauma with a range of dissociative symptoms of which the hallmark symptoms are derealization and depersonalization (8). Empirical support for the subtype includes evidence for antecedent validators (that trauma and stress are linked to dissociation) (4), concurrent validators (that distinctive psychobiological mechanisms underlie dissociation) (9), predictive validators (that dissociation predicts poor treatment outcome) (10,11), and differential response to treatments tailored to this subtype (12,13).

Existing studies of this dissociative subtype, however, are mainly based on treatment-seeking samples in Western countries (5–7,9,12,14–17). As treatment seekers exhibit greater comorbidity and impairment than nontreatment seekers, clinical samples do not represent the full spectrum of PTSD in the population. Indeed, dissociation may prove especially sensitive to treatment selection bias, given that symptoms such as reduced awareness, fragmented memories, and compartmentalized affects could influence help seeking. To our knowledge, though, there have been no large-scale population-based studies of dissociation

in PTSD, leaving it unclear whether associations documented in clinical studies, such as those between the dissociative subtype and early childhood adversities or repeated traumatic experiences (9,18,19), generalize to the population. Dissociation may also prove highly sensitive to culture bias, making it important to consider the possibility of cross-cultural variability in symptom expression and meaning (20,21).

The current report uses epidemiologic data from 16 countries in the World Health Organization (WHO) World Mental Health (WMH) Surveys to examine the generalizability of previously reported results regarding the prevalence and correlates of PTSD with versus without dissociation. We focus on both predictors (characteristics of the trauma implicated in the PTSD, socio-demographics, childhood adversities, prior traumas, temporally primary comorbid disorders) and outcomes (PTSD symptom counts, role impairments, suicidality, treatment) that we have reason to believe, based on previous studies (4,7,9,14–18), might distinguish between PTSD with and without dissociation.

Methods and Materials

Samples

Interviews were administered in nine countries classified by the World Bank (22) as high income (Belgium, France, Germany, Italy, Japan, Northern Ireland, Portugal, Spain, United States) and seven upper-middle income (São Paulo in Brazil, Bulgaria, Lebanon, Mexico, Romania) or low/lower-middle income (Colombia and Beijing/Shanghai in the People's Republic of China). All but five surveys were based on area probability household samples representative of the entire nation. The exceptions were surveys of all urbanized areas in two countries (Colombia and Mexico) and of specific metropolitan areas in three countries (São Paulo in Brazil, a series of cities in Japan, and Beijing and Shanghai in the People's Republic of China). Interviews were conducted face-to-face in respondent homes after obtaining informed consent. Human Subjects Committees monitored the surveys and approved recruitment and consent procedures in each country.

Interviews had two parts. Part I, administered to all respondents, assessed core anxiety, mood, disruptive behavior, and substance disorders and basic sociodemographic correlates. All part I respondents with a lifetime history of any core disorder plus a probability subsample of other respondents were administered part II, which assessed other disorders and a wide range of correlates. Trauma and PTSD were assessed in part II. Probability subsamples of part II respondents were administered exploratory question series, one of which assessed 30-day nonspecific psychological distress and included questions about dissociation that can be used to define a dissociative subtype of PTSD. This subset of part II respondents is the focus of the current report. This subsample was weighted to adjust for the undersampling of part I noncases and to adjust for sociodemographic/geographic discrepancies between samples and populations based on census data. The number of part II respondents in this subsample ranges from 189 across five Western European countries (Belgium, France, Germany, Italy, and Spain) to 5692 in the United States and totals 25,018 across all countries. Response rates range from a low of 55.1% (Japan) to 87.7% (Colombia) (69.0% weighted average). Technical details about WMH sample design are presented elsewhere (23).

Measures

The WMH interviews assessed prevalence and a wide range of predictors and consequences of numerous anxiety, mood, disruptive behavior, and substance disorders (24). The full text of the interview schedule is available at www.hcp.med.harvard.edu/wmh. The following section reviews only the measures considered in the current report.

Translation—The WMH interview schedule was developed in English and translated into other languages using a standardized WHO translation, back-translation, and harmonization protocol described elsewhere (25). Consistent interviewer training and quality control monitoring procedures were used in all surveys to facilitate cross-national comparison (26).

Trauma Exposure—Interviews assessed lifetime exposure to 27 traumatic events, including 7 related to war and sectarian violence (e.g., combatant, civilian in a war zone), 5 types of physical assault (e.g., mugged), 3 types of sexual assault, 6 types of trauma involving threats to physical integrity excluding violence (e.g., life-threatening accidents), traumatic death of a loved one, and 5 types of trauma involving threats to others (e.g., life-threatening illness-injury of loved one). Respondents were asked to report lifetime exposure to each trauma on a hard copy list and to check off each endorsed event for future reference. Two additional open-ended questions asked about 1) any other traumatic event not included on the list and 2) traumatic events respondents did not wish to describe concretely. Positive responses were followed by probes to assess the respondent's age when each trauma first occurred.

Mental Disorders—Mental disorders were assessed with the WHO Composite International Diagnostic Interview (CIDI) (27), a fully structured interview designed to generate diagnoses of common DSM-IV and ICD-10 mental disorders. DSM-IV criteria, including organic exclusions and diagnostic hierarchy rules, are used here. In addition to PTSD, we consider five anxiety disorders (separation anxiety disorder, panic disorder and/or agoraphobia, generalized anxiety disorder, specific phobia, and social phobia), two mood disorders (major depressive disorder/dysthymia and bipolar disorder), four disruptive behavior disorders (attention-deficit/hyperactivity disorder, oppositional-defiant disorder, conduct disorder, and intermittent explosive disorder), and two substance disorders (alcohol and drug abuse with/without dependence). Age-of-onset (AOO) of each disorder was assessed using special probing techniques shown experimentally to improve recall accuracy (28). Individual-level AOO reports of PTSD and comorbid disorders were compared to define temporally primary comorbid disorders to predict dissociation in 12-month PTSD.

As detailed elsewhere (29), generally good concordance was found between diagnoses based on CIDI and blinded Structured Clinical Interview for DSM-IV (30) clinical reappraisal interviews. Concordance for PTSD was in the moderate range (31), with κ of .49 and area under the receiver operating characteristic curve of .69. The two components of area under the receiver operating characteristic curve, sensitivity and specificity, were 38.3 and 99.1, respectively, resulting in a positive likelihood ratio of 42, which is well above the 10 threshold typically used to define screening scale diagnoses as definitive (32). Consistent with the high positive likelihood ratio, positive predictive value (the proportion of CIDI cases confirmed by the Structured Clinical Interview for DSM-IV) of DSM-IV/CIDI PTSD was 86.1%, suggesting that the vast majority CIDI cases would independently be judged to have PTSD by trained clinicians.

Posttraumatic stress disorder was assessed twice in the CIDI: once for symptoms associated with the respondent's self-selected worst lifetime trauma and a second time for symptoms associated with one other lifetime trauma selected using a random number generator from the respondent's lifetime traumas. Occurrence of the 17 DSM-IV Criterion B–D PTSD symptoms was assessed for the month after each trauma when the respondent experienced the largest number of symptoms. (Respondents who reported only one lifetime trauma were, of course, assessed only once.) Respondents who reported any lifetime Criterion B–D symptoms of PTSD associated with each trauma were then asked if they had three or more such symptoms in the 12 months before interview associated with any lifetime trauma. Respondents who answered affirmatively were then evaluated for 12-month PTSD and

asked which lifetime events caused these 12-month symptoms. Twelve-month PTSD was defined as meeting full lifetime DSM-IV/CIDI criteria and continuing to have at least some symptoms in the 12 months before interview.

The draft DSM-5 criteria define the dissociative subtype of PTSD as the subset of cases experiencing persistent or recurrent depersonalization or derealization (http://www.dsm5.org/ProposedRevision/Pages/proposedrevision.aspx?rid=165). The WMH interview schedule included a section on 30-day prevalence of nonspecific psychological distress that contained two questions on depersonalization (the experience of feeling as though they are standing next to themselves or watching themselves do something and they actually see themselves as if they were looking at another person; and the experience of feeling that their body does not seem to belong to them) and one on derealization (the experience of feeling that other people, objects, and the world around them are not real) from the Dissociative Experiences Scale (33). We defined respondents with 12-month DSM-IV/CIDI PTSD as having an approximation of the dissociative subtype if they reported either often or sometimes (on a four-category response scale that also included the categories rarely and never) having one or more of these three experiences. Cronbach's α for a scale of these items was .64.

Correlates of Dissociation in PTSD—In addition to the variables described above, we examined four potential correlates of dissociation in 12-month PTSD: prior (to the onset of PTSD) trauma history, childhood adversities; current impairments due to PTSD, and recent treatment.

Prior trauma history was assessed by calculating the number of lifetime traumas the respondent reported experiencing at an earlier age than age of exposure to the trauma implicated in their current PTSD.

Childhood adversities (CAs) were assessed with 12 measures, some overlapping with the traumas implicated in the PTSD, that included three types of interpersonal loss (parental death, parental divorce, and other parent-caregiver loss), four types of parental maladjustment (mental illness, substance abuse, criminality, and family violence), four types of maltreatment (physical, sexual, and emotional abuse and neglect), and family economic adversity. Physical and emotional abuse were assessed with a modified version of the Conflict Tactics Scale (34), sexual abuse with questions from the CIDI trauma section, and neglect with questions developed by child welfare researchers on frequency of lacking adequate food, clothing, and medical care; inadequate supervision; and being required to do age-inappropriate chores (35). Parental criminality was assessed with questions about perpetration, arrest, and incarceration (36). Parental mental illness (major depression, generalized anxiety disorder, panic disorder, and suicide attempt) and substance abuse were assessed with the Family History Research Diagnostic Criteria Interview (37) and its extensions (38). Family violence was assessed with the modified Conflict Tactics Scale. Economic adversity was assessed with questions about how often the respondent's family of origin lacked basic necessities of living. The distributions and structure among the CAs are reported elsewhere (39,40), where we show that the parental maladjustment and respondent maltreatment CAs cluster together into what we have referred to as a pattern of maladaptive family functioning.

Impairment due to PTSD was assessed with separate questions about suicidality and role functioning. Suicidality was assessed with the CIDI suicidal behavior module (41), which asked about 12-month occurrence of suicide ideation, plans, and attempts. Role functioning was assessed with a modified version of the Sheehan Disability Scale (SDS) (42), which asked respondents to rate how much their PTSD interfered with each of four role domains

(home management, ability to work, social life, and close relationships) using a 0 to 10 response scale of None (0), Mild (1–3), Moderate (4–6), Severe (7–9), and Very Severe (10) interference. A global SDS score was created by assigning each respondent the highest SDS domain score across the four domains.

Recent treatment was assessed with questions administered to all part II WMH respondents about treatment in the past 12 months for problems with their emotions, nerves, or use of alcohol or drugs in each of four sectors: specialty (psychiatrist, psychologist, or other health care provider in a mental health specialty setting), general medical (nonpsychiatrist health care provider not in a mental health specialty setting), human services (religious-spiritual advisor, social worker, or counselor not in the mental health specialty setting), and complementary-alternative medical (any other healer, internet support group, self-help group). In addition, respondents with 12-month PTSD were asked if they saw any professional in the past 12 months specifically for their PTSD.

Analysis Methods

Cross-tabulations were used to estimate prevalence of dissociation among respondents with 12-month PTSD and the association between trauma type and dissociation among respondents with 12-month PTSD. Logistic regression analysis (43) was used to examine correlates of dissociation among respondents with 12-month PTSD. The logistic regression coefficients and their standard errors were exponentiated and are reported here as odds ratios (ORs) with 95% confidence intervals. To adjust for the weighting-clustering of WMH data, standard errors were estimated using the Taylor series method (44) implemented in the SUDAAN software system (Research Triangle International, Research Triangle Park, North Carolina) (45). Multivariate significance was evaluated with Wald χ^2 tests based on design-corrected coefficient variance-covariance matrices. Statistical significance was consistently evaluated using .05 level two-sided tests.

Results

Prevalence

Twelve-month prevalence (standard error) of DSM-IV/CIDI PTSD in the total sample is 1.9% (.1), with 14.4% (1.3) of these cases estimated to have the dissociative subtype (Table 1). The latter proportion does not differ significantly across the seven broad types of trauma assessed in the surveys ($\chi^2_6 = 8.5$, $p = .20$). This compares with a 2.8% (.1) prevalence of these dissociative symptoms in the remainder of the sample.

PTSD Symptom Dimensions

Among respondents with 12-month DSM-IV/CIDI PTSD, presence of dissociation was significantly and positively associated with number of re-experiencing symptoms (Criteria B1–B5) but not with numbers of avoidance (Criteria C1–C3), emotional numbing (Criteria C4–C7), or hyperarousal (Criteria D1–D5) symptoms (Table 2). More detailed analyses found that Criterion B3 (flashbacks; OR = 2.3, 95% confidence interval = 1.3–4.2) accounts for the association of re-experiencing with dissociation, that the only other individual symptom significantly associated with dissociation is Criterion C3 (psychogenic amnesia; OR = 1.6, 95% confidence interval = 1.0–2.6), and that no significant differences exist by country income level in the associations of symptom with dissociation ($\chi^2_4 = .4$, $p = .82$). (Detailed results of these and other analyses not reported in tables are available on request.)

Sociodemographics, Trauma History, and PTSD Onset-Duration

Controlling for type of trauma implicated in the PTSD, odds of dissociation among respondents with 12-month PTSD are significantly elevated among men (OR = 1.7),

respondents whose PTSD started in childhood (2.8–4.1), and respondents who experienced prior traumas (2.0–4.7) (Table 3). Number of years since onset of PTSD and country income level, in comparison, are not significantly associated with dissociation. These patterns are largely unchanged with additional controls for numbers of symptoms of re-experiencing, avoidance, emotional numbing, and hyperarousal. More detailed analyses found a significant interaction of country income level with AOO of PTSD in predicting dissociation (χ^2_3 = 3.4, p = .022). This interaction indicates that the elevated OR of dissociation associated with early AOO is confined to ages 1 to 12 in high-income countries and extends to ages 1 to 19 in low/middle income countries. None of the other predictors in Table 3 has a significant interaction with country income level.

Childhood Adversities

Almost all CAs considered in the WMH surveys are associated with elevated odds of dissociation among respondents with 12-month PTSD in bivariate models (OR = 1.3–2.2). Four of these associations are significant (parental mental illness and substance disorder, family violence, and parental divorce) (Table 4). These associations all attenuate in a multivariate additive model. An alternative model in which numbers rather than types of CAs are used as predictors finds a significant dose-response relationship between numbers of maladaptive family functioning CAs and dissociation. The ORs of individual CAs all become nonsignificant when controls are introduced for numbers of CAs. The ORs in the numbers of CAs model remain significant when additional controls are introduced for numbers of symptoms of re-experiencing, avoidance, emotional numbing, and hyperarousal. More detailed analyses found no significant differences by country income level in the associations of CAs with dissociation.

Prior Disorders

All but 2 of the 13 temporally prior (to the onset of PTSD) lifetime comorbid DSM-IV/CIDI disorders considered here are associated with elevated odds of dissociation among respondents with 12-month PTSD in bivariate models (OR = 1.4–3.3). Six of these associations are significant (bipolar disorder, separation anxiety disorder, panic/agoraphobia, generalized anxiety disorder, specific phobia, and oppositional-defiant disorder) (Table 5). An alternative model in which numbers rather than types of comorbid disorders are used as predictors finds that high comorbidity (i.e., four or more comorbid disorders) is associated with especially elevated odds of dissociation (10.0). The numbers of disorders coefficients become nonsignificant, while the coefficients associated with separation anxiety disorder and specific phobia remain significant (3.0–3.6) in a model that includes both types and numbers of comorbid disorders as predictors. The ORs in the most parsimonious model (i.e., the model using only numbers of disorders as predictors) are largely unchanged when additional controls are introduced for numbers of symptoms of re-experiencing, avoidance, emotional numbing, and hyperarousal. More detailed analyses found no significant differences by country income level in these associations of disorders with dissociation.

Impairment, Suicidality, and Treatment

Significantly higher proportions of respondents with than without dissociation reported severe 12-month role impairments due to their PTSD (Table 6). Odds ratios in bivariate models across the four SDS scales (1.8–3.6) are consistently significant and remain elevated (1.8–3.6) in models that control for PTSD symptom counts. Dissociation is also associated with significantly elevated odds of 12-month suicidality (3.4–6.1). These ORs remain elevated (3.2–5.0) in models that control for PTSD symptom counts. More detailed analyses found no significant interactions between country income level and dissociation in predicting either impairments or suicidality (χ^2_1 = .1–1.9, p = .17–.79).

The rate of 12-month treatment for any emotional problem is insignificantly higher among respondents with PTSD in the presence versus absence of dissociative symptoms and remains unchanged when we control for PTSD symptom counts. The rate of 12-month treatment specifically for PTSD is not meaningfully higher in the presence versus absence of dissociative symptoms despite the higher rates of severe role impairment and suicidality associated with dissociation. More detailed analyses found no significant interactions between country income level and dissociation in predicting either type of treatment (χ^2_1 = 1.0–2.0, p = .16–.31).

Discussion

These results have to be interpreted in the context of several study limitations. The number of respondents with 12-month PTSD was too small for country-specific analyses. Posttraumatic stress disorder was assessed with a fully structured lay-administered interview rather than a clinical interview, introducing the possibility of conceptual confounding. This possibility increases due to the fact that the dissociation items were chosen post hoc rather than developed specifically to operationalize the proposed DSM-5 criteria. This limited assessment, the potential overlap of dissociative symptoms with a range of quite different experiences (e.g., symptoms of mood, anxiety, and psychotic disorders (46–48), and the fact that dissociative symptoms were assessed in a separate part of the interview and for a different time frame (past 30 days) should all lead to caution in interpreting results. Our use of a simple yes-no dichotomy to differentiate cases of PTSD with and without dissociative symptoms, furthermore, while consistent with the proposed DSM-5 formulation, can also be considered a limitation in that it failed to consider either the more fine-grained differentiations among dissociative symptoms called for in some studies (49,50) or the possibility that dissociation might be characterized more accurately as being on a continuum rather than as being associated with a distinct dichotomous subtype of PTSD (51,52). These refinements could not be investigated due to the small number of dissociative symptoms assessed.

Bearing these limitations in mind, the results presented here provide the first cross-national population-level epidemiologic data on the distribution and correlates of dissociative symptoms in PTSD. A number of key findings are noteworthy. The most fundamental of these is that we found 14.4% of PTSD cases in the community to meet criteria for the dissociative subtype, a proportion that does not differ significantly across the diverse set of countries considered here. This demonstrates clearly that the dissociative subtype is not confined to developed countries. This proportion is within the range found in previous studies (5–7,15,16).

Only one of our findings is in some sense inconsistent with previous evidence regarding correlates of dissociation in PTSD: that the proportion of cases meeting criteria for a dissociative subtype is significantly higher among male subjects than female subjects. Previous clinical studies either found dissociation more common among women than men (5,7,17) or no gender difference (15). Yet, the elevated OR of dissociation among male subjects versus female subjects is quite stable in the WMH data in that it is comparable in high-income and low/middle income countries. Given this consistency, the association deserves further investigation to determine the relevant psychological and biological mechanisms involved.

An especially intriguing set of WMH findings is that dissociation among respondents with PTSD is associated with childhood onset, exposure to prior traumatic events (and especially to a high number [5+] of prior traumatic events), and childhood adversities. When considered in conjunction with the finding that dissociation is not related to trauma type, this

implies that early age of exposure and repeated exposure are more critical than the content of exposure in promoting dissociative symptoms among people with PTSD. Clinical research is consistent with the finding that dissociative symptoms in PTSD can be found across a wide range of trauma types (9,53). A number of studies have also found that dissociation might be more common in early-onset PTSD associated with exposure to a complicated series of traumas (e.g., [15,54,55]). This pattern is consistent with discussions in clinical studies about complex PTSD and Disorders of Stress Not Otherwise Specified (56,57). However, these formulations suggest that such individuals also exhibit behavioral difficulties (such as impulsivity, aggression, sexual acting out, alcohol/drug misuse, and self-destructive actions), emotional difficulties (such as affective lability, rage, depression, and panic), cognitive difficulties (such as dissociation and pathological changes in personal identity), interpersonal difficulties, somatization, and in the most recent formulation, deficits in regulating emotional distress (58). These broader sets of symptoms were not assessed in the WMH surveys, leaving it for future investigators to determine the relationship between the dissociative subtype and complex PTSD.

The WMH findings that dissociation is associated with elevated PTSD symptom counts, high role impairment, and suicidality are consistent with clinical evidence that dissociation is related to severity of PTSD (7,11,59). It is striking in light of this fact that we failed to find evidence that respondents whose PTSD featured dissociation were more likely than those without dissociation to obtain treatment for their PTSD. This finding might indicate that dissociation undermines treatment seeking for PTSD, perhaps highlighting the need for differential screening and treatment strategies for people whose PTSD includes dissociative symptoms (4,60).

These results help to characterize the proposed dissociative subtype of PTSD in community samples. We document clearly that dissociation exists in a meaningful and roughly equal proportion of PTSD cases throughout a diverse set of countries. We find that the proposed dissociative subtype has value not only in that it distinguishes a meaningful proportion of PTSD cases but also that these cases have a distinct clinically meaningful set of predictors and consequences that are roughly equivalent across countries. And we find that this subtype is associated with a particularly impairing form of PTSD. These results raise the possibility that dissociation might be a marker of a complex form of PTSD characterized not only by early onset and exposure to multiple childhood traumas-adversities but also by multiple comorbidities and other clinical features not assessed in the WMH surveys. While evaluation of this possibility goes beyond the scope of the current report, the results presented here suggest that it deserves future empirical investigation.

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Table 1

Prevalence of Dissociative Symptoms Among Respondents with 12-Month DSM-IV/CIDI PTSD as a Function of Trauma Type Implicated in the PTSD[a]

	Proportion with Dissociative Symptoms[b]		
Trauma Type	**%**	**(SE)**	***n*[c]**
War-Related	17.5	(4.6)	30
Sexual Violence	19.9	(3.4)	144
Physical Violence	13.9	(3.1)	102
Accident	16.2	(4.9)	80
Traumatic Death of Loved One	13.0	(3.3)	201
Network Event	12.0	(3.5)	98
Other/Private Event[d]	8.9	(2.6)	92
Total	14.4	(1.3)	747

CIDI, The World Health Organization Composite International Diagnostic Interview; PTSD, posttraumatic stress disorder; WMH, World Mental Health.

[a] War-related traumas include: combat experience, purposefully injured or tortured or killed someone, relief worker in a war zone, civilian in a war zone, civilian in a region of terror, refugee, and saw atrocities; sexual violence traumas include: rape, sexual assault, and stalking; physical violence traumas include beaten by a parent or other childhood caregiver, beaten by a spouse or other romantic partner, beaten up by anyone else, mugged or threatened with a weapon, and kidnapped; accident traumas include natural disaster, toxic chemical exposure, other man-made disaster, life-threatening automobile accident, other life-threatening accident or injury, and life-threatening illness; network event traumas include having a life-threatening illness, any other traumatic event experienced by a loved one, witnessed physical violence at home as a child, discovered or saw a dead body or witnessed someone die or become seriously injured, and accidentally caused someone to have a serious injury or die.

[b] The proportion of cases with DSM-IV/CIDI PTSD who had dissociative symptoms does not differ significantly across trauma types ($\chi^2_6 = 8.5$, $p = .20$).

[c] The sample sizes reported represent the denominators (i.e., all respondents with the trauma type in the row; not the proportion of this total that had dissociative symptoms).

[d] Other events include all those reported in response to an open-ended question about exposure to traumas not on the prespecified WMH list that would not clearly be classified back into one of the more specific categories on that list. Private events include those reported in response to the following question: “Sometimes people have experiences they don’t want to talk about in interviews. I won’t ask you to describe anything like this, but, without telling me what it was, did you ever have a traumatic event that you didn’t report to me because you didn’t want to talk about it?”

Table 2

Mean Differences and Multivariate Associations (Odds Ratios) of Standardized DSM-IV/CIDI PTSD Symptom Counts Among Respondents with 12-Month DSM-IV/CIDI PTSD in the Presence Versus Absence of Dissociative Symptoms ($n = 747$)

	Dissociative Symptoms Present		Dissociative Symptoms Absent			
	Mean[a]	(SE)	Mean[a]	(SE)	OR[b]	(95% CI)
Re-experiencing	.39[c]	(.15)	−.07	(.05)	1.3[d]	(1.1–1.7)
Avoidance	.22	(.15)	−.04	(.07)	1.1	(.9–1.4)
Numbing	.20	(.11)	−.03	(.05)	1.1	(.9–1.4)
Hyperarousal	.16	(.20)	−.03	(.05)	1.0	(.8–1.3)
Total	.38	(.20)	−.07	(.05)	1.4	(1.0–1.9)
n	126		621			

CI, confidence interval; CIDI, The World Health Organization Composite International Diagnostic Interview; OR, odds ratio; PTSD, posttraumatic stress disorder.

[a] Symptom scores were standardized to a mean of 0 and variance of 1.

[b] Based on a multivariate logistic regression model with the four symptom counts predicting the presence versus absence of dissociative symptoms among respondents with 12-month DSM-IV/CIDI PTSD.

[c] Significant difference between mean number of symptoms of re-experiences, avoidance, numbing, and hyperarousal among respondents with versus without dissociative symptoms at the .05 level, two-sided test.

[d] Significant association between the predictor and presence versus absence of dissociative symptoms at the .05 level, two-sided test.

Table 3

Associations (Odds Ratios) of Sociodemographic Variables and Trauma Characteristics with the Presence Versus Absence of Dissociative Symptoms Among Respondents with 12-Month DSM-IV/CIDI PTSD (n = 747)[a]

	No Controls		With Controls	
	OR	**(95% CI)**	**OR**	**(95% CI)**
Sex				
Male	1.7[b]	(1.0–2.5)	1.7[b]	(1.0–2.8)
Female	1.0	—	1.0	—
Age of Onset of PTSD[c]				
0–6	4.1[b]	(1.4–11.4)	4.2[b]	(1.4–12.6)
7–12	2.8[b]	(1.2–6.6)	2.7[b]	(1.1–6.4)
13–19	1.4	(.7–2.5)	1.3	(.7–2.5)
20+	1.0	—	1.0	—
χ^2_3		3.1[b]		3.0[b]
Number of Years Since Onset of PTSD[c]				
0–4	1.5	(.6–3.6)	1.7	(.7–3.9)
5–12	.7	(.4–1.5)	.8	(.4–1.7)
13–24	1.3	(.6–2.5)	1.2	(.6–2.4)
25+	1.0	—	1.0	—
χ^2_3		2.4		2.4
Country Income Level				
Low/middle income	1.1	(.6–1.9)	1.1	(.6–2.0)
High income	1.0	—	1.0	—
Number of Prior Traumas[d]				
None	1.0	—	1.0	—
1–4	2.0[b]	(1.1–3.9)	1.8	(.9–3.5)
5+	4.7[b]	(2.2–10.1)	3.8 [b]	(1.6–8.7)
χ^2_2		8.4[b]		5.3[b]

CI, confidence interval; CIDI, The World Health Organization Composite International Diagnostic Interview; OR, odds ratio; PTSD, posttraumatic stress disorder.

[a]Based on a multivariate logistic regression model predicting the presence versus absence of dissociative symptoms among respondents with 12-month DSM-IV/CIDI PTSD controlling for trauma type without and then with additional controls for numbers of re-experiencing, avoidance, numbing, and hyperarousal symptoms.

[b]Significant association between the predictor and presence versus absence of dissociative symptoms at the .05 level, two-sided test.

[c]The predictor was divided to create roughly equal sample sizes in each category.

[d]The predictor was divided to capture the functional form detected by examining the association with a completely disaggregated version of the variable.

Table 4

Bivariate and Multivariate Associations (Odds Ratios) of Childhood Adversities with the Presence Versus Absence of Dissociative Symptoms Among Respondents with 12-Month DSM-IV/CIDI PTSD (n = 747)[a]

	Bivariate		Multivariate Additive		Count of CAs		Multivariate Nonadditive		Count of CAs with Controls	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Maladaptive Family Functioning CAs										
Physical abuse	1.3	(.7–2.5)	1.0	(.5–1.9)			.8	(.4–1.8)		
Sexual abuse	1.4	(.7–3.0)	1.3	(.7–2.5)			1.2	(.6–2.3)		
Neglect	1.5	(.9–2.5)	.7	(.4–1.4)			.7	(.4–1.3)		
Parental mental illness	2.1[b]	(1.1–8.6)	1.8[b]	(1.0–3.3)			1.7	(.9–3.2)		
Parental substance disorder	2.1[b]	(1.0–4.2)	1.6	(.8–3.1)			1.3	(.6–3.0)		
Parental criminality	1.8	(.9–3.5)	1.2	(.6–2.4)			1.2	(.6–2.6)		
Family violence	2.2[b]	(1.4–3.6)	1.8[b]	(1.0–3.0)			1.5	(.8–2.8)		
χ^2_7				2.1[b]				1.0		
Other CAs										
Parental death	.8	(.4–1.7)	.8	(.4–1.8)			.9	(.4–2.2)		
Parental divorce	1.9[b]	(1.0–3.4)	1.5	(.8–2.9)			1.6	(.8–3.5)		
Other parent loss	1.5	(.8–3.0)	1.3	(.6–2.7)			1.6	(.7–3.4)		
Physical illness	1.7	(.9–3.2)	1.7	(.9–3.2)			2.0	(.9–4.3)		
Economic adversity	1.7	(1.0–3.0)	1.2	(.7–2.2)			1.4	(.7–3.0)		
χ^2_5				1.6				1.0		
Number of Maladaptive Family Functioning CAs										
0					1.0	—	1.0	—	1.0	—
1					1.5	(.8–3.0)	1.0	—	1.5	(.7–3.1)
2					2.6[b]	(1.2–5.3)	1.6	(.6–4.0)	2.5[b]	(1.2–5.1)
3+					3.3[b]	(1.5–7.2)	1.5	(.4–5.5)	3.1[b]	(1.4–6.8)
$\chi^2_{3/2}$						3.2[b]	.5			2.9[b]
Number of Other CAs										
0					1.0	—	1.0	—	1.0	—
1					1.2	(.7–2.0)	1.0	—	1.2	(.7–2.0)

	Bivariate		Multivariate Additive		Count of CAs		Multivariate Nonadditive		Count of CAs with Controls	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
2					1.7	(.9–3.4)	.9	(.4–2.1)	1.7	(.9–3.3)
3+					1.6	(.6–4.6)	.5	(.1–2.4)	1.5	(.5–4.5)
$\chi^2_{3/2}$						1.0	.4			.9

CA, childhood adversity; CI, confidence interval; CIDI, The World Health Organization Composite International Diagnostic Interview; OR, odds ratio; PTSD, posttraumatic stress disorder.

[a]Based on a series of logistic regression models controlling for trauma type and the predictor variables in Table 3 predicting the presence versus absence of dissociative symptoms among respondents with 12-month DSM-IV/CIDI PTSD. The count of CAs with controls model additionally controls for numbers of re-experiencing, avoidance, numbing, and hyperarousal symptoms.

[b]Significant association between the predictor and presence versus absence of dissociative symptoms at the .05 level, two-sided test.

Table 5

Bivariate and Multivariate Associations (Odds Ratios) of Temporally Primary Lifetime DSM-IV/CIDI Disorders with the Presence Versus Absence of Dissociative Symptoms Among Respondents with 12-Month DSM-IV/CIDI PTSD ($n = 747$)[a]

	Bivariate		Multivariate Additive		Count of Disorders		Multivariate Nonadditive		Count of Disorders with Controls	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Anxiety Disorders										
Separation anxiety disorder	3.2[b]	(1.9–5.6)	2.7[b]	(1.5–4.7)			3.0[b]	(1.5–6.1)		
Panic disorder/agoraphobia	2.3[b]	(1.2–4.7)	1.2	(.5–2.5)			1.1	(.5–2.6)		
Generalized anxiety disorder	2.5[b]	(1.2–5.1)	1.8	(.8–3.9)			2.0	(.8–4.6)		
Specific phobia	3.3[b]	(2.1–5.3)	3.0[b]	(1.9–4.8)			3.6[b]	(1.8–7.1)		
Social phobia	1.4	(.7–2.8)	.8	(.4–1.8)			.9	(.5–1.9)		
χ^2_5				8.0[b]			3.7[b]			
Mood Disorders										
Major depression/dysthymia	1.5	(.9–2.7)	1.0	(.5–2.0)			1.1	(.6–2.1)		
Bipolar disorder	2.5[b]	(1.1–5.8)	1.1	(.4–2.8)			1.0	(.3–2.8)		
χ^2_2				.0			.1			
Disruptive Behavior Disorders										
ADHD	1.7	(.8–3.8)	1.4	(.6–3.3)			1.4	(.5–3.7)		
Oppositional-defiant disorder	2.4[b]	(1.0–5.5)	1.4	(.5–3.7)			1.5	(.6–4.1)		
Conduct disorder	2.2	(.8–6.5)	1.5	(.5–4.7)			1.6	(.5–5.2)		
Intermittent explosive disorder	1.8	(.9–3.3)	1.7	(.9–3.4)			1.9	(.9–4.3)		
χ^2_4				1.2			1.2			
Substance Abuse (With or Without Dependence)										
Alcohol	.8	(.4–1.6)	.6	(.3–1.4)			.7	(.3–1.8)		
Drug	1.0	(.4–2.9)	.8	(.2–2.6)			.7	(.2–2.4)		
χ^2_2				1.1			.8			
Number of Disorders										
0					1.0	—	1.0	—	1.0	—
1					3.6[b]	(1.4–9.2)	1.0	—	3.7[b]	(1.4–9.7)
2					2.6	(1.0–6.8)	.5	(.2–1.6)	2.6[b]	(1.0–6.7)

	Bivariate		Multivariate Additive		Count of Disorders		Multivariate Nonadditive		Count of Disorders with Controls	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
3					2.2	(.7–7.4)	.3	(.1–1.2)	2.1	(.6–7.2)
4+					10.0[b]	(3.8–26.3)	.7	(.1–3.5)	9.3[b]	(3.4–25.3)
$\chi^2_{4/3}$						6.7[b]	1.4		5.8[b]	

ADHD, attention-deficit/hyperactivity disorder; CI, confidence interval; CIDI, The World Health Organization Composite International Diagnostic Interview; OR, odds ratio; PTSD, posttraumatic stress disorder.

[a]Based on a series of multivariate logistic regression models controlling for the variables in Table 3 predicting the presence versus absence of dissociative symptoms among respondents with 12-month DSM-IV/CIDI PTSD. The count of disorders with controls model additionally controls for numbers of re-experiencing, avoidance, numbing, and hyperarousal symptoms.

[b]Significant association between the predictor and presence versus absence of dissociative symptoms at the .05 level, two-sided test.

Table 6

Mean Differences and Multivariate Associations (Odds Ratios) of 12-Month Impairment and Treatment Among Respondents with 12-Month DSM-IV/CIDI PTSD in the Presence Versus Absence of Dissociative Symptoms

	Dissociative Symptoms Present		Dissociative Symptoms Absent		No Controls		With Controls[a]	
	%	(SE)	%	(SE)	OR	(95% CI)	OR	(95% CI)
Severe Impairment in Role Functioning								
Home	43.2[b]	(5.8)	29.3	(3.1)	1.8[c]	(1.0–3.3)	1.8	(1.0–3.1)
Work	45.0[b]	(5.8)	28.2	(3.1)	2.1[c]	(1.2–3.7)	2.0[c]	(1.1–3.5)
Close relationships	61.9[b]	(5.7)	30.9	(3.2)	3.6[c]	(2.2–6.0)	3.6[c]	(2.2–6.0)
Social life	61.5[b]	(7.4)	36.8	(3.5)	2.7[c]	(1.4–5.2)	2.8[c]	(1.4–5.4)
Any	79.4[b]	(4.9)	50.0	(3.3)	3.9[c]	(2.0–7.4)	3.8[c]	(2.0–7.4)
Suicidality								
Ideation	29.2[b]	(5.1)	10.9	(1.7)	3.4[c]	(1.9–6.1)	3.2[c]	(1.8–5.7)
Plan	13.9[b]	(3.5)	3.1	(.7)	5.0[c]	(2.3–10.9)	4.0[c]	(1.8–8.9)
Attempt	11.5[b]	(3.3)	2.1	(.6)	6.1[c]	(2.6–14.3)	5.0[c]	(2.1–11.7)
Treatment								
For any emotional problem	57.7	(6.1)	44.8	(2.8)	1.7	(1.0–2.9)	1.6	(.9–2.8)
For PTSD	31.8	(5.0)	30.6	(3.3)	1.1	(.6–1.8)	.9	(.5–1.6)
n[d]	126		621					

CI, confidence interval; CIDI, The World Health Organization Composite International Diagnostic Interview; OR, odds ratio; PTSD, posttraumatic stress disorder.

[a] Based on a series of logistic regression models in each of which one of the impairment, suicidality, or treatment items predicted the presence versus absence of dissociative symptoms among respondents with 12-month DSM-IV/CIDI PTSD. The with controls models additionally control for numbers of re-experiencing, avoidance, numbing, and hyperarousal symptoms.

[b] Significant difference in prevalence of correlates among respondents with and without dissociative symptoms at the .05 level, two-sided test.

[c] Significant odds ratio of presence versus absence of dissociative symptoms associated with the correlate.

[d] The results for severe impairment and treatment of PTSD are based on the smaller subsample of 429 respondents (89 with and 340 without dissociative symptoms) who met full criteria for DSM-IV/CIDI PTSD for at least 1 month in the past year. The other 318 (747 – 429) respondents met full criteria for DSM-IV/CIDI PTSD before the past year but either had full symptoms for less than 1 month in the past year or had partial but not full symptoms for at least 1 month in the past year.