Perceived helpfulness of treatment for post-traumatic stress disorder: Findings from the World Mental Health Surveys

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Abstract

Background: Perceived helpfulness of treatment is an important healthcare quality indicator in the era of patient-centered care. We examine probability and predictors of two key components of this indicator for post-traumatic stress disorder (PTSD).

Methods: Data come from World Mental Health surveys in 16 countries. Respondents who ever sought PTSD treatment (n=779) were asked if treatment was ever helpful and, if so, the number of professionals they had to see to obtain helpful treatment. Patients whose treatment was never helpful were asked how many professionals they saw. Parallel survival models were estimated for obtaining helpful treatment in a specific encounter and persisting in help-seeking after earlier unhelpful encounters.

Results: 57.0% of patients eventually received helpful treatment, but survival analysis suggests that it would have been 85.7% if all patients had persisted in help-seeking with up to six professionals after earlier unhelpful treatment. Survival analysis suggests that only 23.6% of patients would persist to that extent. Odds of ever receiving helpful treatment were positively associated with receiving treatment from a mental health professional, short delays in initiating help-seeking after onset, absence of prior comorbid anxiety disorders and childhood adversities, and initiating treatment prior to 2000. Some of these variables predicted helpfulness of specific treatment encounters and others predicted persistence after earlier unhelpful encounters.

Conclusions: The great majority of PTSD patients would receive treatment they considered helpful if they persisted in help-seeking after initial unhelpful encounters, but most patients whose initial treatment is unhelpful give up before receiving helpful treatment.

Keywords

Introduction

The World Health Organization's (WHO) World Mental Health (WMH) survey initiative has significantly advanced our understanding of the global epidemiology of trauma and post-traumatic stress disorder (PTSD) (Bromet, Karam, Koenen, & Stein, 2018). WMH data were collected from 26 countries using coordinated, rigorous, and innovative interviewing methods to comprise the largest cross-national dataset on trauma and PTSD to date. The surveys have delineated rates of and risk factors for exposure to traumatic events (Benjet et al., 2016) and subsequent PTSD (Kessler et al., 2017), have clarified secondary psychiatric and medical morbidities (Kessler et al., 2011; Scott et al., 2016) as well as burden of disease (Kessler, Aguilar-Gaxiola, Alonso, Lee, & Koenen, 2018), and have provided data on health services use for PTSD in different contexts (Thornicroft et al., 2018). WMH data have also been used to address several clinical questions, such as optimal diagnostic criteria and identification of those at risk for PTSD (Karam et al., 2010; Stein et al., 2013, 2014).

Nevertheless, several epidemiological and clinical aspects of the treatment of PTSD deserve further attention. First, relatively little has been written about the perceived helpfulness of PTSD treatment (e.g., Cooper et al., 2017; Starzynski & Ullman, 2014). With increased focus on the lived experience of individuals suffering from mental disorders and on patient-centered care (Bellamy et al., 2016), this is a key gap. Second, there are few data on the longitudinal course of PTSD treatment, including data on perceived helpfulness over time, or data on persistence with treatment. Such data may be useful in informing clinical treatment guidelines, which are currently mainly based on randomized trials in highly controlled settings (explanatory designs) rather than on sequential investigations in everyday contexts (pragmatic designs) (Fagiolini et al., 2017; Janiaud, Dal-Re, & Ioannidis, 2018).

The probability of an individual with PTSD ever receiving helpful treatment is a joint function of the probability that any one treatment professional will be perceived as helpful and the probability that a patient will continue to seek treatment after an earlier treatment failure. Questions in the WMH surveys about perceived helpfulness of initial and subsequent treatments of PTSD, as well as on a range of variables previously found to predict treatment outcomes (e.g., trauma type, socio-demographics, prior mental disorder, childhood adversities) provide a unique opportunity to examine predictors of both these components. We aimed to address gaps in the literature on PTSD treatment by cross-national investigation of (i) the perceived helpfulness of initial and subsequent efforts to obtain treatment for PTSD and (ii) the probability of persistence in help-seeking after initially obtaining unhelpful treatment, as the two main components in a patient eventually finding a treatment that they consider helpful.

Materials and Methods

Samples

The WMH surveys are a coordinated set of community surveys administered to probability samples of the non-institutionalized population in countries throughout the world (https://www.hcp.med.harvard.edu/wmh/; Kessler & Ustün, 2004). Data for the current report came from WMH surveys carried out in 18 surveys from 16 countries – ten in countries classified

by the World Bank as high-income (Argentina, Australia, Israel, Japan, New Zealand, Northern Ireland, Portugal, Saudi Arabia, Spain and United States) and six in countries classified as low- or middle- income (Brazil, Bulgaria, Colombia, Lebanon, Mexico and Romania). There were two surveys in Bulgaria, administered to separate samples, and there are two surveys in Colombia (one national and one in Medellin). Eleven surveys were based on nationally representative household samples, whereas three were representative of selected Metropolitan Areas (Sao Paolo Brazil; Medellin Colombia; Japan), one was representative of selected regions (Murcia Spain), and three were representative of all urbanized areas (Colombia, Mexico, Argentina). Response rates ranged from 55.1% (Japan) to 97.2% (Medellin) and averaged 70.1% across surveys (see Appendix Table 1).

The interview schedule was developed in English and translated into other languages using a standardized WHO translation, back-translation and harmonization protocol (Harkness et al., 2008). Interviews were administered face-to-face in respondents' homes after obtaining informed consent using procedures approved by local Institutional Review Boards. Study procedures were carried out in accordance with the latest version of the Declaration of Helsinki. Interviews were in two parts. Part I was administered to all respondents and assessed core DSM-IV mental disorders (n=88,444 respondents across all surveys). Part II assessed additional disorders and correlates and was administered to 100% of respondents who met lifetime criteria for any Part I disorder and a probability subsample of other Part I respondents (n=52,979). Part II respondents were weighted to adjust for differential probabilities of selection into Part II and deviations between the sample and population demographic-geographic distributions. This weight resulted in prevalence estimates of Part I disorders in the weighted Part II sample being identical to those in the Part I sample (Heeringa et al., 2008).

Measures

Post-traumatic stress disorder—Diagnoses were based on Version 3.0 of the WHO's Composite International Diagnostic Interview (CIDI; Kessler & Ustün, 2004), a fully-structured lay-administered diagnostic interview. DSM-IV criteria were used to define PTSD along with a number of other anxiety disorders (generalized anxiety disorder, panic disorder, agoraphobia with or without panic disorder, specific phobia and social phobia), mood disorders (major depressive disorder and bipolar disorder), and substance use disorders (alcohol and drug abuse and dependence). The assessment of PTSD began with a series of questions about lifetime exposure to a wide range of traumatic experiences. When more than one lifetime traumatic experience was reported, PTSD was assessed twice: once for symptoms associated with the traumatic experience the respondent reported as having caused the most distress and impairment; and a second time for one randomly selected other traumatic experience. PTSD was assessed only once among respondents who reported having only one traumatic experience in their life and not at all among respondents who never had a traumatic experience. Item missing values on symptom reports were rare and were coded as if the symptom was absent when they occurred. Clinical reappraisal interviews were carried out in a number of WMH surveys using the lifetime non-patient version of the Structured Clinical Interview for DSM-IV (SCID; First, Spitzer, Gibbon, & Williams, 2002) as the gold standard. Good agreement was found between diagnoses of

PTSD based on the CIDI and on blinded SCID clinician-administered reappraisal interviews (AUC=.69, positive predictive value [PPV]=.86; Haro et al., 2006).

Helpful treatment: Respondents who met lifetime DSM-IV/CIDI criteria for PTSD were asked retrospectively about age-of-onset and were then asked whether they ever "talk(ed) to a medical doctor or other professional about" their PTSD and, if so, how old they were the first time they talked to a professional about their PTSD. "Other professionals" were defined broadly to include "psychologists, counselors, spiritual advisors, herbalists, acupuncturists, and other healing professionals." Respondents answering yes were then asked whether they ever got treatment for their PTSD "that you considered helpful or effective *(emphasis in original)*." If so, they were asked how many professionals they ever talked to about their PTSD "up to and including the first time you ever got helpful treatment." Respondents who said they never got helpful treatment, in comparison, were asked how many professionals they ever talked to about their PTSD. Only respondents who reported receiving treatment for their PTSD were included in the analyses. The few with item missing values on age of first treatment, age of first helpful treatment and number of professionals seen for each country were analyzed based on regression-based imputations of the missing items that took into account scores on the reported items as well as other patient reported characteristics.

Predictors of helpful treatment: *Socio-economic characteristics* included age at first PTSD treatment (continuous), sex, marital status (married, never married, previously married), and education (in quartiles defined by within-country distributions). Item missing values of demographic predictors were uncommon due to the fact that surveys were interviewer administered. The few missing items were imputed using regression-based imputation methods. *Childhood adversities*(CAs) occurring before age 18 years were assessed retrospectively. These included CAs related to family dysfunction (physical abuse, sexual abuse, neglect, parent mental disorder, parent substance use disorder, parent criminal behavior and family violence), and well as others (parent died, parent divorced, other parent loss, physical illness and economic adversity). *Lifetime comorbid conditions* included number of anxiety, mood, and substance use disorders with first onsets prior to the age the respondent first sought treatment. Item missing values on childhood adversities and comorbid symptoms were rare and were coded as if absent when they occurred. *Treatment type* was defined as the cross-classification of variables for: (i) whether the respondent reported receiving medication, talk therapy, or both, as of the age of first PTSD treatment; and; (ii) types of treatment providers seen as of that age, including mental health specialists (psychiatrist, psychiatric nurse, psychologist, psychiatric social worker, mental health counselor) with or without pharmacotherapy, primary care providers, human services providers (social worker or counselor in a social services agency, spiritual advisor), and complementary/alternative medicine (other type of healer or self-help group). *Treatment timing* included a dichotomous measure for whether the respondent's first attempt to seek treatment occurred before 2000 or subsequently and a continuous variable for length of delay in years between age-of-onset of PTSD and age of initially seeking treatment. The year 2000 corresponds to the midpoint when treatment was first received by patients in the sample and also aligns with the first FDA approval (December 1999) for an evidence-based

treatment of PTSD. Item missing values were uncommon and were imputed using regression-based imputation methods.

Analysis methods

The sample for analysis was limited to people with onset of lifetime DSM-IV PTSD treatment on or after 1990 in order to minimise potential effects of recall bias. The probability of obtaining helpful treatment is a joint function of the probability that any one treatment provider will be perceived as helpful and the probability that a patient will continue to seek treatment after an initial treatment encounter considered to be unhelpful. In order to investigate these two components separately, we used discrete-event survival analysis to calculate the conditional and cumulative probabilities of: (i) obtaining helpful treatment after seeing between one and six professionals; and (ii) persisting in seeking treatment from up to six professionals after failing to obtain helpful treatment from the previous professional(s) seen (Halli & Rao, 1992). We followed patients up through six professionals, because this was the last number where at least 30 patients received treatment. We then carried out parallel discrete-event survival analyses of the predictors of these two component outcomes using standard discrete-time methods and a logistic link function (Willett & Singer, 1993). Because the WMH sample designs used weighting and clustering, all statistical analyses were carried out using the Taylor series linearization method (Wolter, 1985), a design-based method implemented in the SAS 9.4 program (SAS Institute Inc., 2016). Logistic regression coefficients and +/− 2 of their design-based standard errors were exponentiated to create odds ratios (ORs) and 95% confidence intervals (CIs). Significance tests of sets of coefficients were made using Wald χ^2 tests based on design-corrected coefficient variance-covariance matrices. Statistical significance was evaluated consistently using two-sided design-based .05 level tests.

Results

PTSD prevalence and treatment

Lifetime prevalence of PTSD was 5.3% in high-income countries, 2.3% in low/middle-income countries, and 4.4% in the total sample. (Table 1) Among respondents with lifetime PTSD, 26.4% in high-income countries ever sought treatment compared to 6.8% in low/middle-income countries and 23.5% in the total sample. Roughly half these patients (57.0%) reported that treatment was helpful. This proportion did not differ significantly between high- and low/middle- income countries (57.6% vs. 43.8%, χ^2_1=2.1, p=0.15). Median of providers seen was higher for patients who obtained helpful treatment than not in high-income countries (1.3 vs. 1.0) but not low/middle-income countries (1.0 vs. 1.0).

Helpful PTSD treatment across professionals seen

Probability of obtaining helpful PTSD treatment from the first professional seen was 24.0% in the total sample. (Table 2) Conditional probabilities of subsequent professionals being helpful if they were seen after earlier unhelpful treatments were in the range 22.7–32.7% and did not vary significantly depending on number of prior unhelpful treatments (χ^2_4=1.98, p=0.74). These proportions were very similar in high-income vs. low/middle-income countries.

Survival analysis based on these conditional probabilities suggests that the cumulative probability of receiving helpful treatment from at least one treatment provider would increase from 24.0% after the first professional seen to 48.8% if all patients continued to a second provider after a first treatment failure. This estimated cumulative probability would increase to an estimated 85.7% if all patients persevered in trying up to six professionals after earlier ones were unhelpful. These patterns were generally similar across country income levels (see also Appendix Table 2 for the probabilities up to the 49th professional).Persistence with PTSD treatment seeking following earlier unhelpful treatment

In the total sample, 67.9% of patients who were not helped by the first professional seen persisted in seeing a second professional. (Table 3; see also Appendix Table 3 for the probabilities up to the 49th professional) Further persistence after unhelpful treatments from between one and four subsequent professionals was in the range 65.6–92.5% and varied significantly depending on number of prior unhelpful treatments (χ^2_3=17.4, p=<0.001). These proportions were very similar in high-income vs. low/middle-income countries.

However, not all patients persisted after each unhelpful attempt. Survival analysis based on the conditional probabilities suggests that the cumulative probability of persisting with up to six professionals in the face of prior treatments being unhelpful would be 23.6% in the total sample. Again, patterns were generally similar across country income levels.

Predictors of helpful PTSD treatment

We noted above that 57.0% of the patients who sought treatment for their PTSD reported that they received helpful treatment. Logistic regression analysis at the person-level (i.e., ignoring the number of treatment providers consulted) pooled across this entire sample adjusting for between-country differences found that odds of obtaining helpful treatment was not significantly related to any of the socio-demographic variables considered (age at first PTSD treatment, sex, marital status at the time of initiating treatment, education level at the time of initiating treatment) or to the type of traumatic experience that caused the PTSD. (Table 4) However, five other predictors were significant. Length of delay in seeking treatment after onset of PTSD was inversely related to odds of treatment being helpful. Patients who first obtained treatment in 2000 or later were significantly less likely than those whose treatment began in earlier years to report obtaining helpful treatment. Treatment type was important: the highest odds of helpful treatment was associated with receiving psychotropic medication from a specialty mental health provider and the lowest with treatment in the complementary/alternative medicine sector. Comorbid anxiety disorders were important, although this association was due to patients with exactly 2 but not 3+ other prior anxiety disorders being associated with low odds of PTSD treatment being helpful. And patients with a history of childhood adversity were less likely to obtain helpful treatment. Exclusion of nonsignificant predictors did not modify the strength of the significant predictors meaningfully. (Appendix Table 4)

Decomposition of probabilities (i.e., of getting helpful treatment and of persistence in help-seeking after initially obtaining unhelpful treatment) showed that the pathways accounting for these significant associations varied considerably. Delay in seeking treatment, historical time (treated in 2000 or later), and childhood adversities were all inversely related to

persistence, but were not significantly associated with a particular treatment provider being perceived as helpful. Prior comorbid anxiety disorders, however, were inversely related to perceiving treatment as helpful, but were not related to persistence after unhelpful treatment. Finally, seeking help from a mental health specialist who provided psychotherapy was significantly associated with perceiving treatment as helpful but not in persisting after unhelpful treatment, whereas seeing a mental health specialist who prescribed medication was a significant predictor of persistence but not helpfulness.

We carried out additional analyses to determine whether these significant predictors varied in importance between high- and low/middle- income countries. None of these differences was statistically significant, although it needs to be noted that the number of patients in low/ middle-income countries was too small for statistically powerful analyses of these interactions. We also investigated the possibility of time trends in the significant associations; only one emerged as significant at the .05 level: a stronger association between childhood adversities and decreased odds of treatment being helpful since 2000 than before. (see Appendix Table 5)

Discussion and Conclusion

Several limitations of this study deserve emphasis. One of these is that assessment of key PTSD treatment and treatment response features was based on sparse information. Respondent judgments of the helpfulness of PTSD treatment were based on a single question, which might be understood differently by different respondents. Responses were uncorroborated, uncontrolled, and retrospective. More in-depth and formal measures of patient perceptions of care are available (Oades, Law, & Marshall, 2011; Uttaro, 2003). And controlled trials are needed to determine helpfulness in an objective fashion (i.e., efficacy and effectiveness of care using validated outcome measures). Telescoping (dating past events as occurring more recently than they did) might have led to inaccuracy in estimates of the timing of treatment (Barsky, 2002), although we restricted the sample to patients with onset of PTSD treatment no earlier than 1990 to help address the limitations of recall. In addition, assessment of the precise nature of PTSD treatment was limited to a small number of superficial questions, such as whether and when respondents "talk(ed) to a professional about their PTSD", so questions about how evidence-based the interventions were, cannot be addressed. Finally, assessment of PTSD symptoms, as well as of other key clinical features, at the time of treatment was not undertaken.

While the above paragraph makes it clear that the findings reported here are quite different in scope from those obtained in randomized controlled trials (RCTs) of PTSD interventions, they are important precisely because they address questions which that literature cannot. To our knowledge, this is the first cross-national epidemiological study of perceived helpfulness of PTSD treatment. It is encouraging that we find a slight majority (57.0%) of patients with lifetime PTSD across the world saying that they found their treatment to be helpful. But we estimated that the vast majority (85.7%) might have experienced helpful treatment if they had persevered in trying up to six professionals after earlier treatment failures. However, only a minority of patients persisted in their help-seeking to that extent.

The first of these results is consistent with RCTs of PTSD treatment, which demonstrate that treatment non-response rates are comparatively high and treatment effect sizes are comparatively low even though a number of PTSD interventions are efficacious (Charney, Hellberg, Bui, & Simon, 2018; Difede, Olden, & Cukor, 2014). However, we are unaware of previous research that has investigated the issue of persistence in help-seeking. It is encouraging that across all countries, 67.9% of patients who were not helped by the first professional seen persisted in seeing at least one additional professional. Still, not all people persisted after each unhelpful attempt and we estimated that the cumulative probability of persisting with up to six professionals was only 23.6%.

Our projected estimate that the great majority of patients would have been helped if they had persisted in help-seeking is based on the implicit assumption that people who did not persist with treatment would have had comparable outcomes to those who did if they had persisted. But this is far from certain, as unmeasured variables associated with low persistence (e.g., particular personality traits) might also influence the perception of treatment being unhelpful, in which case efforts to encourage greater persistence in help-seeking would not lead to the good outcomes suggested here. However, the fact that conditional probabilities of treatment being perceived as helpful remained fairly stable regardless of number of prior treatment failures is striking and supports the argument that clinical treatment guidelines for PTSD should encourage patients to persist in help-seeking even after they found a number of treatments not to be helpful. Similarly, conceptual frameworks to enhance person-centered PTSD care should be expanded to include factors addressing treatment motivations and expectations (Etingen et al., 2019; Sharma, Bamford, & Dodman, 2015).

The data reported here on the predictors of perceived helpfulness are also of interest in delineating the pathways that account for the helpfulness of individual clinical encounters and persistence in seeking help after initial unhelpful encounters. Receiving treatment from a mental health specialist who employed psychotherapy was a significant predictor of PTSD treatment being perceived as helpful, but not of persistence with help-seeking after unhelpful treatment. In contrast, shorter delay to treatment, earlier historical time, and receiving treatment from a mental health specialist who prescribed medication were not associated with a particular treatment being considered helpful but nonetheless predicted increased probability of the patient eventually receiving helpful treatment because these variables predicted persistence after earlier unhelpful treatments. Childhood adversities were inversely related to persistence after unhelpful treatment, and comorbid anxiety disorders were associated with perceiving treatment as unhelpful.

These findings are partially consistent with clinical studies of treatment response in PTSD, some of which have found a relationship between childhood adversity and worse outcome (Marshall et al., 1998), and they support PTSD treatment guidelines which emphasize the importance of addressing comorbid conditions (Najavits et al., 2009). However, they also provide novel findings, such as those regarding delayed initiation of help-seeking, and generate hypotheses about mechanisms that deserve further investigation as potential intervention targets. The finding that those with more delayed treatment and those who received treatment since 2000 were less likely to persist with treatment suggests that additional efforts may need to be devoted to psychoeducation emphasizing that best PTSD

treatment should be initiated early and that the best PTSD treatment still requires a trial-and-error approach and great persistence.

We are mindful of the key point that professionals and treatments for PTSD and other disorders are not simply interchangeable (Maj, 2020). It is notable that psychotherapy provided by a mental health specialist predicted early helpfulness, while pharmacotherapy provided by a mental health specialist predicted persistence and so eventual helpfulness. While it is possible that persisting with treatment is associated with more severe symptoms (for example, those thought by the clinical to require medication), our findings can also be read as supporting the point that evidence-based interventions by suitably qualified clinicians, provided within the context of a strong therapeutic alliance and shared decision-making, are important for improving outcomes. Certainly, increased treatment rates, in the absence of efficacious treatments and increased persistence rates, will not decrease prevalence optimally.

The findings here are relevant to a number of currently topical discussions in global health, including those on the scale-up of efficacious treatment (Patel et al., 2018) and those on precision medicine (Seymour et al., 2017). Given the treatment gap for common mental disorders such as PTSD, global mental health implementation science has investigated how best to scale-up efficacious interventions such as those outlined in mhGAP (World Health Organization, 2020). It is crucial that interventions are acceptable and accessible and that quality controls ensure fidelity (Stein, Bass, & Hofmann, 2019). Advances in data science have suggested that techniques such as machine learning may be useful in advancing precision psychiatry for a range of disorders, including PTSD; this may allow clinicians to reduce the extent to which treatment approaches rely on trial-and-error, and to develop more individually targeted treatment strategies (Kessler, Bossarte, Luedtke, Zaslavsky, & Zubizarreta, 2019). Measurement-based care and shared decision-making may also enhance patient-centered care of common mental disorders, including PTSD (Fortney et al., 2017).

In summary, these data on PTSD treatment from the WMH survey initiative are encouraging in emphasizing how often treatment of PTSD is perceived as helpful in the community, but they also suggest the need for more effective PTSD interventions. From a public health perspective, the findings here are consistent with calls for both scale-up of efficacious interventions for common mental disorders, as well as with calls for improved treatment targeting in mental health practice. The estimation that across the world, with persistence in treatment, the vast majority of people with PTSD may eventually perceive treatment as helpful, is a novel one and may usefully inform current treatment guidelines. Further work is needed to determine the extent to which targeted interventions to improve PTSD treatment quality and persistence will improve outcomes.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgements

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Table 1.

Lifetime prevalence of DSM-IV post-traumatic stress disorder (PTSD), proportion of cases with lifetime PTSD who obtained treatment, and proportion of treated cases who perceived treatment as helpful

	In the entire sample — Prevalence of PTSD			Among respondents with lifetime PTSD — Percentage obtained treatment[†]			Among cases that obtained lifetime PTSD treatment[†] — Percentage perceived treatment as helpful[‡]			Number of professionals seen by those who received treatment they never considered helpful		Number of professionals seen by those who received treatment they considered helpful[‡]	
	(n)	%	(SE)	(n)	%	(SE)	(n)	%	(SE)	Median	(IQR)	Median	(IQR)
I. Low/middle-income countries													
Low/middle-income countries	(15,557)	2.3	(0.1)	(605)	6.8	(1.2)	(53)	43.8	(9.2)	1.0	(1.0–2.4)	1.0	(1.0–1.6)
Colombia	(2,381)	1.8	(0.4)	(58)	4.1	(3.1)	(2)	0.0	(0.0)	1.0	(1.0–1.0)		-
Sao Paulo, Brazil	(2,942)	3.2	(0.2)	(160)	8.3	(3.0)	(17)	27.5	(14.4)	2.3	(1.0–2.7)	1.0	(1.0–1.3)
Bulgaria	(2,811)	2.0	(0.3)	(109)	10.3	(2.8)	(14)	71.1	(15.7)	1.5	(1.1–1.9)	1.0	(1.0–2.1)
Lebanon	(1,031)	3.4	(0.6)	(70)	2.5	(1.8)	(2)	100.0	(0.0)		-	1.0	(1.0–1.4)
Medellin, Colombia	(1,673)	3.7	(0.6)	(109)	7.5	(2.6)	(12)	36.6	(16.0)	1.0	(1.0–1.1)	1.0	(1.0–45.1)
Mexico	(2,362)	1.5	(0.3)	(68)	3.1	(1.8)	(4)	32.0	(22.9)	1.0	(1.0–1.0)	1.0	(1.0–1.0)
Romania	(2,357)	1.2	(0.3)	(31)	6.9	(5.2)	(2)	65.8	(31.8)	1.0	(1.0–1.0)	1.0	(1.0–1.0)
χ^2_6		41.9*			6.9			1100.6*					
II. High-income countries													
High-income countries	(37,422)	5.3	(0.1)	(2,906)	26.4	(1.1)	(726)	57.6	(2.4)	1.0	(1.0–1.7)	1.3	(1.0–2.3)
Argentina	(2,116)	2.8	(0.3)	(122)	19.9	(3.7)	(26)	75.4	(10.9)	1.0	(1.0–1.0)	1.0	(1.0–1.6)
Australia	(8,463)	7.3	(0.4)	(640)	39.8	(2.6)	(253)	68.4	(3.7)	1.1	(1.0–1.8)	1.3	(1.0–2.3)
Israel	(4,859)	1.6	(0.2)	(73)	12.0	(4.1)	(8)	47.3	(18.3)	1.0	(1.0–1.4)	1.0	(1.0–1.5)
Japan	(1,682)	1.3	(0.2)	(38)	16.7	(7.5)	(4)	67.4	(26.0)	3.0	(3.0–3.0)	1.0	(1.0–1.0)
Murcia, Spain	(1,459)	2.8	(0.5)	(65)	19.1	(3.7)	(16)	84.9	(11.5)	1.0	(1.0–1.0)	1.0	(1.0–1.4)
New Zealand	(7,312)	6.1	(0.3)	(828)	19.1	(2.0)	(168)	40.2	(5.7)	1.0	(1.0–1.4)	1.5	(1.0–2.7)
Northern Ireland	(1,986)	8.8	(0.7)	(238)	39.2	(4.3)	(80)	53.5	(7.1)	1.0	(1.0–1.6)	1.7	(1.0–2.5)
Portugal	(2,060)	5.3	(0.5)	(180)	28.7	(4.4)	(64)	45.2	(6.9)	1.0	(1.0–1.7)	1.2	(1.0–1.8)

| | In the entire sample | | | Among respondents with lifetime PTSD | | | Among cases that obtained lifetime PTSD treatment[†] | | | | | | |
| | Prevalence of PTSD | | | Percentage obtained treatment[†] | | | Percentage perceived treatment as helpful[‡] | | | Number of professionals seen by those who received treatment they never considered helpful | | Number of professionals seen by those who received treatment they considered helpful[‡] | |
	(n)	%	(SE)	(n)	%	(SE)	(n)	%	(SE)	Median	(IQR)	Median	(IQR)
United States	(5,692)	6.9	(0.4)	(602)	16.0	(1.5)	(104)	42.3	(4.2)	1.1	(1.0–1.9)	1.4	(1.0–2.4)
Saudi Arabia	(1,793)	3.6	(0.5)	(120)	2.4	(1.8)	(3)	100.0	(0.0)	1.5	-	1.5	(1.2–1.9)
χ^2_9		321.6*			106.6*			321.0*					
III. Pooled countries													
All Countries	(52,979)	4.4	(0.1)	(3,511)	23.5	(1.0)	(779)	57.0	(2.4)	1.0	(1.0–1.8)	1.3	(1.0–2.2)
χ^2_{16}		537.1*			174.4*			1130.1*					
Low/middle-income countries vs. High-income countries													
χ^2_1		181.4*			64.4*			2.1					

Abbreviations: SE, standard error; IQR, interquartile range.

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

[†]
Cases are based on three conditions: (i) Respondents obtained PTSD treatment; (ii) Year of first PTSD treatment was 1990 or later; and (iii) Age at onset of PTSD was the year of first PTSD treatment or earlier.

[‡]
Cases are based on four conditions: (i) Respondents obtained PTSD treatment; (ii) Year of first PTSD treatment was1990 or later; (iii) Age at onset of PTSD was the year of first PTSD treatment or earlier; and (iv) Respondents obtained helpful treatment.

Table 2.

Conditional and cumulative probabilities of PTSD treatment being perceived as helpful after each professional seen, among respondents with lifetime DSM-IV PTSD who obtained treatment

| | I. Conditional probabilities | | | | | | | | | II. Cumulative probabilities | | | | | |
| | All | | | High-income countries | | | Low/middle-income countries | | | All (n=779) | | High-income countries (n=726) | | Low/middle-income countries (n=53) | |
	%	(SE)	(n)	%	(SE)	(n)	%	(SE)	(n)	%	(SE)	%	(SE)	%	(SE)
Number of professionals seen after which treatment was perceived as helpful															
1	24.0	(2.3)	(779)	23.8	(2.4)	(726)	27.7	(2.4)	(53)	24.0	(2.3)	23.8	(2.4)	27.7	(2.4)
2	32.7	(2.8)	(417)	33.2	(2.9)	(395)	19.4	(6.0)	(22)	48.8	(2.8)	49.1	(2.9)	41.7	10.2
3	31.4	(3.7)	(198)	32.5	(3.9)	(183)	12.0	(1.1)	(15)	64.9	(2.9)	65.6	(3.0)	48.7	10.9
4	30.1	(7.9)	(97)	30.4	(8.1)	(93)	21.0	(16.6)	(4)	75.5	(2.9)	76.1	(2.9)	59.5	15.2
5	22.7	(5.8)	(57)	23.2	(6.0)	(55)	0.0	(0.0)	(2)	81.1	(2.8)	81.6	(2.7)	59.5	15.2
6	24.8	(7.0)	(40)	25.5	(7.2)	(38)	0.0	(0.0)	(2)	85.7	(2.6)	86.3	(2.6)	59.5	15.2

Abbreviations: PTSD, post-traumatic stress disorder; SE, standard error.

Table 3.

Conditional and cumulative probability of persistence with treatment after previous unhelpful attempts, among respondents with lifetime DSM-IV PTSD who obtained treatment

| | I. Conditional probabilities | | | | | | | | | II. Cumulative probabilities | | | | | |
| | All | | | High-income countries | | | Low/middle-income countries | | | All (n=616) | | High-income countries (n=580) | | Low/middle-income countries (n=36) | |
	%	(SE)	(n)	%	(SE)	(n)	%	(SE)	(n)	%	(SE)	%	(SE)	%	(SE)
Number of professionals seen if not helped by the previous one															
2	67.9	(2.0)	(616)	68.3	(2.1)	(580)	58.0	(2.6)	(36)	67.9	(2.0)	68.3	(2.1)	58.0	(2.6)
3	70.6	(3.0)	(281)	70.0	(3.1)	(263)	84.1	(3.1)	(18)	48.0	(3.0)	47.9	(3.1)	48.8	(11.0)
4	65.6	(3.5)	(145)	68.2	(3.6)	(132)	27.3	(4.2)	(13)	31.5	(3.0)	32.7	(3.1)	13.3	(6.9)
5	81.1	(4.4)	(73)	81.8	(4.6)	(70)	57.9	(0.0)	(3)	25.5	(3.0)	26.7	(3.2)	7.7	(5.4)
6	92.5	(5.1)	(43)	92.2	(5.2)	(41)	100.0	(0.0)	(2)	23.6	(3.1)	24.7	(3.3)	7.7	(5.4)

Abbreviations: PTSD, post-traumatic stress disorder; SE, standard error.

Table 4.

Predictors of helpful treatment and persistence (pooled across professionals seen), and predictors of perceived helpfulness of treatment (person level), among people with lifetime DSM-IV PTSD who obtained treatment

| | Model 1: Predicting helpful treatment pooled across professionals seen | | | | Model 2: Predicting persistence pooled across treatment failure | | | | Model 3: Predicting perceived helpfulness of treatment across PTSD patients | | | |
| | Prevalence | | Multivariate | | Prevalence | | Multivariate | | Prevalence | | Multivariate | |
	Mean/%	(SE)	AOR	(95% CI)	Mean/%	(SE)	AOR	(95% CI)	Mean/%	(SE)	AOR	(95% CI)
Age at first post-traumatic stress treatment	35.0	(0.7)	1.01	(0.99–1.02)	35.2	(0.8)	1.00	(0.99–1.01)	35.5	(0.6)	1.00	(0.99–1.02)
χ^2_1			1.18				0.00				0.06	
Female	69.1	(2.6)	1.03	(0.72–1.46)	68.7	(2.7)	0.93	(0.62–1.40)	69.1	(2.5)	1.31	(0.77–2.24)
Male	30.9	(2.6)	1.00	-	31.3	(2.7)	1.00	-	30.9	(2.5)	1.00	-
χ^2_1			0.02				0.11				0.98	
Marital status												
Never married	41.8	(2.4)	1.39	(0.97–1.99)	41.3	(2.6)	0.91	(0.58–1.44)	41.9	(2.0)	0.92	(0.53–1.58)
Previously married	29.0	(2.8)	1.20	(0.79–1.81)	29.3	(3.0)	1.04	(0.65–1.66)	29.1	(2.1)	1.13	(0.66–1.92)
Currently married	29.2	(2.3)	1.00	-	29.4	(2.6)	1.00	-	29.0	(1.9)	1.00	-
χ^2_2			3.50				0.27				0.42	
Education												
Low	8.2	(1.1)	0.72	(0.43–1.21)	8.9	(1.2)	0.74	(0.39–1.39)	9.4	(1.0)	0.50*	(0.26–0.96)
Low-average	24.8	(2.6)	0.93	(0.61–1.42)	24.0	(2.7)	1.13	(0.71–1.80)	25.6	(2.1)	0.92	(0.55–1.56)
High-average	33.9	(2.2)	0.81	(0.55–1.20)	34.9	(2.5)	0.84	(0.56–1.26)	33.2	(2.1)	0.60*	(0.38–0.93)
High	21.2	(2.3)	1.00	-	20.7	(2.5)	1.00	-	20.7	(1.9)	1.00	-
Student	11.9	(1.6)	0.82	(0.48–1.40)	11.6	(1.8)	1.13	(0.54–2.38)	11.1	(1.3)	0.90	(0.39–2.06)
χ^2_4			2.38				3.01				8.67	
Treatment delay (years)[†]	9.2	(0.7)	0.99	(0.97–1.00)	9.6	(0.8)	0.98*	(0.97–0.99)	9.7	(0.6)	0.98*	(0.96–0.99)
χ^2_1			3.75				7.70*				6.56*	
Started PTSD treatment 2000 (vs. 1990–1999)	57.2	(2.4)	0.82	(0.61–1.10)	57.5	(2.7)	0.50*	(0.34–0.74)	62.6	(2.0)	0.45*	(0.29–0.69)
χ^2_1			1.74				11.77*				13.20*	
Treatment type[‡]												

	Model 1: Predicting helpful treatment pooled across professionals seen				Model 2: Predicting persistence pooled across treatment failure				Model 3: Predicting perceived helpfulness of treatment across PTSD patients			
	Prevalence		Multivariate		Prevalence		Multivariate		Prevalence		Multivariate	
	Mean/%	(SE)	AOR	(95% CI)	Mean/%	(SE)	AOR	(95% CI)	Mean/%	(SE)	AOR	(95% CI)
Mental health specialist + Psychotherapy	51.9	(2.5)	1.51 *	(1.02–2.23)	52.5	(2.7)	1.59	(0.95–2.68)	51.0	(2.2)	2.01 *	(1.19–3.40)
Mental health specialist + Medication	68.1	(2.3)	1.42	(0.91–2.21)	68.3	(2.5)	1.88 *	(1.29–2.73)	60.2	(2.4)	2.18 *	(1.31–3.60)
General medical	80.8	(1.6)	0.77	(0.55–1.09)	82.0	(1.6)	1.61 *	(1.01–2.57)	76.3	(1.8)	1.06	(0.63–1.78)
Complementary/alternative medicine	26.6	(2.0)	1.07	(0.75–1.51)	27.5	(2.2)	0.79	(0.54–1.14)	24.5	(2.0)	0.90	(0.55–1.47)
Human services	24.9	(2.4)	1.00	-	26.5	(2.7)	1.00	-	22.9	(2.1)	1.00	-
χ^2_4			11.80 *				17.90 *				13.68 *	
Exactly 2 or more of the above	79.6	(1.7)	0.55	(0.30–1.00)	80.5	(1.8)	1.39	(0.78–2.48)	72.2	(2.0)	0.89	(0.46–1.72)
χ^2_1			3.79				1.22				0.13	
χ^2_5			13.14 *				37.51 *				22.98 *	
Number of lifetime anxiety disorders §												
3 or more lifetime anxiety disorders §	34.4	(2.4)	0.87	(0.62–1.21)	35.9	(2.6)	1.43	(0.95–2.14)	28.3	(1.9)	1.33	(0.85–2.06)
Exactly 2 lifetime anxiety disorders §	28.4	(2.2)	0.68 *	(0.47–0.98)	29.3	(2.5)	0.77	(0.52–1.15)	30.7	(2.1)	0.53 *	(0.34–0.84)
Exactly 1 lifetime anxiety disorder §	37.2	(2.5)	1.00	-	34.8	(2.7)	1.00	-	40.9	(2.3)	1.00	-
χ^2_2			5.16				10.92 *				18.35 *	
Lifetime mood disorders												
Major depressive disorder	48.9	(2.6)	1.06	(0.80–1.41)	49.2	(2.9)	1.12	(0.76–1.66)	46.2	(2.0)	1.11	(0.73–1.69)
Bipolar disorder	11.9	(1.6)	1.22	(0.70–2.14)	12.5	(1.8)	0.80	(0.47–1.35)	11.5	(1.4)	0.84	(0.43–1.62)
χ^2_2			0.52				2.04				0.83	
Lifetime substance use disorders												
Alcohol and/or drug abuse	35.4	(2.6)	0.90	(0.67–1.21)	36.4	(2.7)	1.26	(0.88–1.81)	31.2	(2.4)	1.13	(0.74–1.72)
Alcohol or drug dependence but not abuse	2.2	(0.5)	1.74	(0.66–4.61)	2.1	(0.5)	1.15	(0.65–2.04)	2.6	(0.6)	1.43	(0.51–4.00)
χ^2_2			1.81				1.57				0.67	
χ^2_6			8.24				14.43 *				22.13 *	
Traumatic events implicated in the PTSD												
Exposure to organized violence ‖	15.8	(1.9)	0.64 *	(0.42–0.98)	16.9	(2.0)	1.21	(0.78–1.87)	14.3	(1.5)	0.78	(0.42–1.42)

	Model 1: Predicting helpful treatment pooled across professionals seen				Model 2: Predicting persistence pooled across treatment failure				Model 3: Predicting perceived helpfulness of treatment across PTSD patients			
	Prevalence		Multivariate		Prevalence		Multivariate		Prevalence		Multivariate	
	Mean/%	(SE)	AOR	(95% CI)	Mean/%	(SE)	AOR	(95% CI)	Mean/%	(SE)	AOR	(95% CI)
Participation in organized violence [††]	44.0	(2.6)	1.13	(0.87–1.47)	44.7	(2.8)	1.03	(0.72–1.46)	41.9	(2.3)	1.10	(0.73–1.64)
Physical violence victimization [‡‡]	33.7	(2.4)	0.59*	(0.43–0.80)	35.7	(2.6)	1.48	(0.99–2.21)	27.4	(2.2)	0.79	(0.48–1.31)
Sexual violence victimization [§§]	63.7	(2.2)	1.31	(0.97–1.77)	63.1	(2.4)	1.05	(0.74–1.49)	63.0	(2.1)	1.34	(0.91–1.98)
Accidents/injuries [¶¶]	51.3	(2.7)	0.97	(0.97–1.40)	53.1	(3.0)	1.21	(0.84–1.76)	48.7	(2.0)	1.03	(0.68–1.58)
Other [†††]	66.7	(2.5)	0.95	(0.71–1.26)	67.7	(2.7)	0.97	(0.66–1.42)	64.5	(2.2)	0.98	(0.63–1.52)
χ^2_6			22.61*				7.80				3.49	
Childhood adversities												
Family dysfunction [‡‡‡]	30.8	(1.7)	0.79	(0.57–1.10)	34.0	(2.0)	0.88	(0.62–1.25)	29.6	(1.5)	0.71	(0.47–1.08)
Other [§§§]	12.9	(1.1)	0.75	(0.54–1.05)	14.3	(1.2)	0.51*	(0.37–0.70)	16.0	(1.2)	0.40*	(0.26–0.60)
χ^2_2			5.07				18.93*				21.84*	
Global χ^2_{29}			86.82*				194.32*				100.70*	

Abbreviations: PTSD, post-traumatic stress disorder; SE, standard error; AOR, adjusted odds ratio; CI, confidence interval.

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

[†] Treatment delay (years) = Age at first PTSD treatment − Age at onset of PTSD.

[‡] Treatment providers: mental health specialists (psychiatrist, psychiatric nurse, psychologist, psychiatric social worker, mental health counselor), primary care providers (social worker or counselor in a social services agency, spiritual advisor), and complementary/alternative medicine (other type of healer or self-help group).

[§] Lifetime anxiety disorders include generalized anxiety disorder, panic disorder, agoraphobia with or without panic disorder, posttraumatic stress disorder, specific phobia and social phobia.

[¶] Exposure to organized violence includes relief worker in war zone, civilian in war zone, civilian in region of terror, refugee and kidnapped.

[††] Participation in organized violence includes witnessed death/dead body/serious injury, accidentally caused serious injury/death, combat experience, purposely injured/tortured/killed someone and witnessed atrocities.

[‡‡] Physical violence victimization includes beaten by caregiver, beaten by someone else and witnessed physical fight at home.

[§§] Sexual violence victimization includes raped, sexually assaulted, stalked, beaten by spouse/romantic partner, trauma to loved one, some other trauma and private trauma.

[¶¶] Accidents/injuries includes natural disaster, toxic chemical exposure, automobile accident, life-threatening illness, child with serious illness and other life-threatening accident.

†††Other includes mugged/threatened with a weapon, human-made disaster and unexpected death of a loved one.

‡‡‡Family dysfunction includes physical abuse, sexual abuse, neglect, parent mental disorder, parent substance use disorder, parent criminal behavior and family violence. Percentages represent the proportions of respondents with one or more of these childhood adversities.

§§§Other childhood adversities include parent died, parent divorced, other parent loss, physical illness and economic adversity. Percentages represent the proportions of respondents with one or more of these childhood adversities.