# RESEARCH

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# Barriers to 12-month treatment of common anxiety, mood, and substance use disorders in the World Mental Health (WMH) surveys

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# Abstract

**Background** High unmet need for treatment of mental disorders exists throughout the world. An understanding of barriers to treatment is needed to develop effective programs to address this problem.

**Methods** Data on barriers were obtained from face-to-face interviews in 22 community surveys across 19 countries  $(n = 102,812 \text{ respondents aged} \ge 18 \text{ years}, 57.7\%$  female, median age [interquartile range]: 43 [31–57] years; 68.5% weighted average response rate) in the World Mental Health (WMH) surveys. We focus on the n = 5,136 respondents with 12-month DSM-IV anxiety, mood, or substance use disorders with perceived need for treatment. The n = 2,444 such respondents who did not receive treatment were asked about barriers to receiving treatment, whereas the n = 926 respondents who received treatment with a delay were asked about barriers leading to delays. Consistent with previous research, we distinguished five broad classes of barriers: low perceived disorder severity, two types of barriers in the domain of predisposing factors (beliefs/attitudes about treatment ineffectiveness and stigma) and two types in the domain of enabling factors (financial and nonfinancial). Baseline predictors of receiving treatment ment found in a prior report (i.e., comparing the n = 2,692 respondents who received treatment with the n = 2,444 who did not) were examined as predictors of barriers, while barriers were examined as mediators of associations between these predictors and treatment.

**Results** Most respondents reported multiple barriers. Barriers among respondents who did not receive treatment included low perceived severity (52.9%), perceived treatment ineffectiveness (44.8%), nonfinancial (40.2%) and financial (32.9%) barriers in the domain of enabling factors, and stigma (20.6%). Barriers causing delays in treatment had a similar rank-order but were reported by higher proportions of respondents ( $X_1^2 = 3.8-199.8$ , p = 0.050 - < 0.001). Barriers were predicted by low education, disorder type, age, employment status, and financial obstacles. Predictors varied as a function of barrier type.

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**Conclusions** A wide range of barriers to treatment exist among people with mental disorders even after a need for treatment is acknowledged. Most such individuals have multiple barriers. These results have important implications for the design of programs to decrease unmet need for treatment of mental disorders.

**Keywords** Mental disorders, Barriers to treatment, Mental disorder treatment, Treatment gap, Use of health services, Treatment delays, Mental health services, Health services accessibility

# Background

Mental disorders are prevalent worldwide with rates of 20–25% of individuals in most countries experiencing one or more disorders within the last 12 months and up to 50% over the course of their life [1, 2]. Moreover, evidence in the past decade indicates that prevalence of these disorders is on the rise for children, adolescents, and adults [3–6]. There are evidence-based treatments, including psychosocial interventions and medications for many of these disorders [7, 8]. However, available evidence suggests that only a minority of individuals in need of treatment receive services [9, 10].

To understand the paucity of individuals who receive treatment, we analyzed data from the World Mental Health (WMH) Surveys on self-reported 12-month treatment among respondents who met criteria for 12-month disorders. The WMH surveys are a series of community epidemiologic surveys designed to estimate true prevalence [1], correlates [11], and unmet need for treatment [12] of common mental disorders in countries throughout the world. Earlier WMH reports presented data on key aspects of the mental disorder treatment "cascade" for selected disorders [13–16]. This cascade refers to the pathways beginning with the onset of a mental disorder through the completion of effective treatment. More recently we initiated a coordinated series of studies to trace patterns and correlates of key stages of the treatment cascade across the full range of disorders assessed in the WMH surveys [9]. Among the stages we considered are recognition of need for treatment [17], initial treatment given this recognition [18], and adequacy of treatment after initial treatment [19]. The unique crossnational WMH database allows us to evaluate individuallevel and country-level correlates of these different stages in the cascade, providing a more comprehensive picture than in the past of how gross correlates of eventually obtaining effective treatment are mediated through these stages in ways that could have implications for policy planning and targeted intervention.

In the current report, we present WMH data on barriers to initial treatment among individuals with 12-month disorders who perceived a need for treatment. Our prior work showed that perceived need for treatment is a key factor in obtaining treatment. Individuals who recognize such a need are roughly ten times as likely to receive treatment as those who lack such a recognition [13–16]. Even so, only about one-third of WMH respondents with a 12-month disorder and perceived need for treatment had contact with the treatment system in the 12 months before their interview [9]. We were able to document significant predictors of treatment given perceived need, including characteristics of the disorders, socio-demographic characteristics, and history of prior treatment [18]. In that earlier report we also searched for countrylevel predictors of receiving treatment but found only two significant predictors of this type out of 18 considered: the standardized (to a mean of 0 and standard deviation of 1 across countries) per capita number of non-psychiatrist MDs in the population; and the proportion of GDP devoted to healthcare spending. Both these country-level variables were associated with modestly increased probabilities of receiving treatment.

There is also an alternative way to investigate determinants of seeking treatment; namely, by asking respondents with perceived need who did not seek treatment about their reasons for not doing so and then examining the correlates of these barriers along with the extent to which these barriers account for the associations of the predictors in our earlier report with failure to obtain treatment. These are the foci of the current report.

Several frameworks have been used in prior studies to organize the investigation of barriers to treatment among individuals with mental disorders [20-22]. All of these frameworks distinguish among (i) predisposing factors, most notably beliefs and attitudes about the perceived effectiveness of treatment and perceived stigma of seeking treatment for mental disorders; (ii) enabling factors (both financial factors and nonfinancial factors such as problems with transportation or scheduling, being unsure about where to go or who to see, thinking that treatment would take too much time or be inconvenient, and not being able to get an appointment); and (iii) factors involving low perceived disorder severity [23]. Financial barriers are often distinguished from other barriers in the domain of enabling factors based on their perceived significance [24, 25].

We took a similar approach in WMH by asking questions to distinguish five broad categories of barriers: attitudes and beliefs about perceived treatment effectiveness; attitudes and beliefs about stigma; practical barriers involving finances; practical barriers involving a wide range of other enabling factors; and barriers involving perceived disorder severity.

#### Methods

## Aims

The aims of the current report are to present information about the distributions and correlates of barriers to treatment and the extent to which these barriers account for associations found in our earlier report on predictors of receiving 12-month treatment across the wide range of common mental disorders and countries considered here [18]. Prior studies have generally found that each of these barriers is common and that many individuals report multiple barriers [20-22]. We expected to find the same general pattern here. We did not have any hypotheses, though, regarding the extent to which individual barriers accounted for the significant predictors found in our prior study of receiving 12-month treatment [18] other than two commonsense expectations: first, that the associations of country-level differences in per capita number of non-psychiatrist MDs and of the proportion of GDP spent on healthcare with receiving treatment would be mediated by reduced barriers involving access; and, second, that the association of socio-economic status with receiving treatment would be mediated by financial barriers.

#### Sample

Data comes from 22 WMH surveys administered between 2001 and 2019 in 19 countries (see Supplementary Table 1, Additional File 1). The combined sample size across surveys was n = 102,812 respondents aged 18 and older (57.7% female, median [IQR] age 43 [31–57]). Seven of the 22 surveys were administered in countries classified by the World Bank as low- or middle-income (LMIC) countries (a regional survey in São Paulo, Brazil, a national survey in Bulgaria, two in Colombia including one national survey and a regional survey in Medellin, and single surveys in Mexico, Peru, and Romania) and the others in countries classified as high-income (HIC; Argentina, Belgium, France, Germany, Israel, Italy, Japan, Netherlands, Northern Ireland, two national surveys in Poland, Portugal, two in Spain including one national survey and another in Murcia, and the United States). All surveys used multi-stage clustered area probability household sample designs other than Japan. Japan used an unclustered survey design, as respondents were randomly selected from population registries in 11 metropolitan areas. Fourteen surveys were nationally representative (Belgium, Bulgaria, France, Germany, Israel, Italy, the Netherlands, Northern Ireland, two in Poland, Portugal, Romania, Spain, United States) and the others were representative of selected regions, metropolitan areas, or urbanized areas. Response rates ranged between 45.9% and 97.2%, with a weighted (by sample size) average response rate across surveys of 68.5% using the American Association for Public Opinion Research RR1w definition [26].

The WMH interview was divided into two parts to reduce respondent burden. Part I, which was administered to all n = 102,812 respondents, assessed core mental disorders. Part II was administered to 100% of the Part I respondents who met lifetime criteria for any disorder assessed in Part I plus a probability subsample of the remaining Part I respondents, for a total Part II sample of n=51,520 respondents. Part II assessed disorders of secondary interest as well as correlates, such as social determinants, exposure to adverse experiences, use of services and psychoactive medication, among other information. Part II data were weighted to adjust for the under-sampling of Part I non-cases, thereby making the prevalence estimates of Part I disorders in the weighted Part II sample equivalent to the prevalence estimates in the Part I sample. A within-household probability of selection weight was also applied to all data to adjust for the fact that respondents were randomly selected within households and the number of eligible potential respondents varied across households. Finally, a calibration weight was applied to the data within each survey to adjust for discrepancies between the joint distributions of the sample and the population on a range of socio-demographic and geographic variables known for the population based on census data. We focus on the Part II sample in the current report.

## Measures

The interview: Trained lay interviewers administered a fully structured diagnostic interview, the Composite International Diagnostic Interview Version 3.0 (CIDI 3.0) [27], face-to-face with respondents in their homes. The interview and training materials were developed in English and then translated into other languages following a standard translation protocol [28]. Interviewers were required to complete a standardized training course successfully before they could undertake fieldwork and collect data for the study. Consistent procedures were then used across surveys to check interviewer accuracy and ensure the use of consistent data cleaning and coding procedures [29]. Informed consent was obtained before starting the interview. Local institutional review committees approved and monitored the surveys to ensure protection of human subjects as per appropriate international and local guidelines. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation.

Disorders: The CIDI assesses lifetime and 12-month disorders using the definitions and criteria of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) and the 10th revision of the International Classification of Diseases (ICD-10). DSM-IV criteria are presented in the current report. Blinded clinical reappraisal studies carried out in Asia [30, 31], Europe [32, 33], Latin America [34], the Middle East [35], and the US [36] found consistently good concordance between DSM-IV diagnoses based on the CIDI and diagnoses based on blinded gold standard clinical reappraisal interviews based on the Structured Clinical Interview for DSM-IV [37]. As noted previously in the subsection on samples, we consider here 12-month cases of the 11 DSM-IV disorders that were assessed in common across the WMH surveys. These disorders were collapsed into nine summary categories for analysis, including: (1) five anxiety disorders (generalized anxiety disorder [GAD], panic disorder and/or agoraphobia [Panic/Ago], specific phobia [SP], social phobia [SoP], post-traumatic stress disorder [PTSD]), (2) two mood disorders (major depressive disorder [MDD], bipolar spectrum disorder [BD], where the latter includes either bipolar I disorder, bipolar II disorder, or subthreshold bipolar disorder; see [38] for details), and (3) two substance use disorders assessing criteria for misuse or dependence (alcohol use disorder [AUD] and drug use disorder [DUD]). DSM-IV organic exclusion rules were applied but diagnostic hierarchy rules were not applied other than between MDD and BD.

Twelve-month disorder severity at the person level was defined as either severe, moderate, or mild. Respondents were defined as having a severe disorder profile either if they (i) met criteria for bipolar I disorder and/or substance use disorder with a physiological dependence syndrome; (ii) made a suicide attempt in the 12 months before the interview; or (iii) reported having severe role impairment for at least one month in the past 12 months due to their mental or substance use disorders. If not severe, respondents were defined as having a moderately severe disorder profile if they had 12-month substance dependence without a physiological dependence syndrome or reported having moderate role impairment for at least one month. All other respondents with 12-month disorders were defined as having a mild disorder profile.

Perceived need for treatment: Our prior work has shown that an important barrier to obtaining treatment for mental disorders is lack of perceived need [39]. We assessed perceived need differently for WMH respondents who did versus did not receive 12-month treatment. Respondents who received treatment were asked: When you went to see a professional about your emotions or substance use in the past year, was this something you wanted to do, or did you go only because someone else was putting pressure on you? Those who said they wanted to obtain professional help and those that said they recognized they needed help but did not want to see a professional because they did not think it would be useful were coded as having perceived need, whereas the others were coded as not having perceived need. Respondents who did not receive 12-month treatment were asked: Was there ever a time during the past 12 months when you felt that you might need to see a professional because of problems with your emotions or nerves or your use of alcohol or drugs? Those who responded yes were coded as having perceived need along with those who responded no but when asked the follow-up question about why they did not feel they needed treatment responded that they recognized they had a problem but did not think professional treatment would help. All others who responded "no, they did not feel they needed treatment in the past 12 months" were coded no on perceived need.

Twelve-month treatment: Treatment was defined for the purposes of this report as any contact with the treatment system in the past 12 months for any of the focal disorders with any of the treatment providers assessed. A list of providers was presented in a respondent booklet to assist with recall; examples of some types of providers were modified to fit the local context, but the broad provider types across surveys always consisted of general medical (including a general practitioner/primary care doctor, any other medical doctor other than a psychiatrist, and any other health care provider, such as a nurse or physician's assistant other than a mental health provider); psychiatrist; other mental health professional (psychologist; counsellor in a mental health specialized setting; social worker in a mental health specialized setting; any other mental health professional, such as a psychotherapist or mental health nurse); human services professional (social worker in a human services setting, counselor in a human services setting, spiritual advisor); and complementary/alternative medicine provider (internet help or self-help groups, any other type of healer). Respondents were asked if they ever in their life saw each of these types of providers for their "emotions, nerves, or mental health" or their "problems with using alcohol or drugs." If so, they were asked which types of providers they saw and, for each one, were then asked additional questions about age of first treatment and treatment in the past 12 months. Twelve-month treatment was defined as receiving any treatment in the past 12 months with any of these types of providers.

*Barriers to 12-month treatment*: Respondents who did not receive treatment even though they met criteria for a disorder and had perceived need were asked about the importance of 14 barriers to treatment commonly found in prior research [39-41] in the domains of: (i) low perceived severity (thinking that the problem would get better on its own; experiencing the problem as not very bothersome; wanting to handle the problem on their own); (ii) financial barriers (insurance would not pay for treatment, concerns about not being able to afford treatment); (iii) nonfinancial barriers in the domain of enabling factors (problems with practical things like transportation or scheduling, being unsure about where to go or who to see, thinking that treatment would take too much time or be inconvenient, not able to get an appointment); (iv) low perceived treatment effectiveness (not satisfied with available treatments, not believing treatment would work, having been in treatment in the past and not finding it helpful); and (v) perceived stigma (concern about what people would think if they found out about the treatment, worry about being involuntarily committed to a hospital). Each barrier was assessed in a yes-no response format. Respondents were coded yes on a domain if one or more of the indicators in the domain were endorsed. A parallel set of questions was asked about reasons for delaying professional help-seeking among respondents with perceived need who reported delaying seeking professional help more than 30 days after first realizing they needed help.

Other predictors: An earlier report on patterns of treatment for 12-month mental disorders found two broad classes of individual-level predictors in addition to disorder type, number, and severity [18] and country-level predictors: socio-demographic characteristics and information about treatment history. Socio-demographics included respondent's sex, age (18-29, 30-44, 45-59, 60+), education (a four-category variable coded low, lowaverage, high average and high with categories specific to the educational system of the country; See [42], employment status (a five-category variable coded employed, homemaker, retired, student, and disabled/other/unemployed), and health insurance (two dichotomous dummycoded variables for having private insurance, including both occupational insurance/social security insurance, and public insurance, including universal health care, in countries that had universal health care). Predictors involving the history of prior treatment included information about the type and number of treatment providers seen prior to the 12 months before the WMH survey, types of prior treatment received (medication, psychotherapy, or both), and the perceived helpfulness of these past treatments.

#### Statistical analyses

As noted previously, weights were applied to the data to adjust for differences in within-household probabilities of selection and to calibrate the samples to match Census population distributions on socio-demographic and geographic variables. Part II data were also weighted to adjust for differential probabilities of selection into Part II. The Taylor series linearization method implemented in SAS 9.4 [43] was used to adjust standard errors for the effects of these weights as well as for the effects of geographic clustering of the WMH data.

Analysis began by using cross-tabulations to examine the associations of 12-month disorders with probability of 12-month perceived need for treatment and receiving treatment as a function of perceived need. Regression analyses then examined the associations of predictor variables, including 12-month disorder types, number, and severity, perceived need, socio-demographics, prior treatment, and per capita number of non-psychiatrist MDs in the country with outcomes of interest, i.e. receiving 12-month treatment and, among respondents who received 12-month treatment, delay in receiving treatment. Given the central importance of perceived need for treatment, we also determined whether the associations of the other predictors with the outcomes differed depending on presence versus absence of perceived need. Some of the n=5,136 respondents with one or more 12-month disorders who perceived a need for treatment reported that this recognition occurred only recently, in which case they were not asked their reasons for not seeking treatment (n = 1,097).

We then examined the distribution of reported reasons separately for not seeking treatment at all and for delays in seeking treatment. After that, we examined the associations of the significant predictors of these two outcomes with each of the reasons in the separate subsamples of participants who did not seek treatment and who did so with delays. Finally, we investigated the extent to which the association of each significant predictor with each of the two outcomes (i.e., obtaining treatment and, among those who obtained treatment doing so without a delay) was mediated by each barrier. The latter required a special type of subgroup analysis in which we sequentially excluded from the analysis sample the subset of respondents who reported one specific type of barrier before estimating the model. Differences in the coefficients of predictors in this restricted sample versus the total sample were used to infer the importance of the excluded type of barrier in accounting for the associations in the total sample. This type of indirect inference was used rather than more conventional control variable analysis (i.e., controlling barriers in a standard multivariable model) because control variable analysis is not possible when none of the people with the control variables (i.e., those who reported barriers) experienced the dependent variable (i.e., received treatment or did so without delay).

The importance of each barrier in explaining the associations of the predictors with the outcomes consequently needed to be inferred using the above indirect approach.

All regression models were estimated using a Poisson link function with robust standard errors [44]. The regression coefficients from these models were exponentiated to create risk ratios (RRs), while the coefficients  $\pm 2$ design-based standard errors were used to create designbased 95% confidence intervals (CIs) of the RRs that took into consideration the weighting and geographic clustering of the WMH data. Significance of RR sets defining a single categorical variable (e.g., the two dummy variables distinguishing married, never married and previously married respondents to define marital status) was evaluated with Wald X<sup>2</sup> tests based on design-corrected coefficient variance – covariance matrices. Statistical significance was evaluated consistently using two-sided design-based 0.05-level tests. The associations involving individual-level predictors were estimated in pooled within-country models including dummy variables for country, whereas the associations of per capita number of non-psychiatrist MDs with the outcomes were estimated in multi-level models adjusting for composition differences in individual-level predictors across countries.

# Results

# Associations of 12-month disorders with perceived need and treatment

Previous WMH reports with slightly different datasets presented results on 12-month prevalence of the disorders considered here [9], the proportion of participants with these disorders who had perceived need for treatment [17], and correlates of receiving treatment for these disorders separately in the presence and absence of perceived need [18]. In brief overview, we found that the overall prevalence of any of the 12-month disorders considered here was 14.2% across all WMH surveys and that 13.9% of those with a 12-month disorder received treatment. The most common class of disorders were anxiety disorders, which occurred among 67.6% of the n = 11,622 respondents with any 12-month disorder followed by mood (39.7%) and substance use (16.8%) disorders (Table 1). The single most common disorders were SP (38.3% of all disorders) and major depressive disorder (31.3%). Regarding clinical severity, 27.3% of cases were classified as severe, 38.6% moderate, and the remaining 34.1% mild.

Overall prevalence of perceived need for 12-month treatment was 40.7% at the person level, varying from a high of 61.0% among respondents with Panic/Ago to a low of 33.3–33.8% among those with SP and AUD, respectively. Perceived need was positively associated with disorder severity. Prevalence of receiving treatment

given perceived need was 30.6% in the total sample but varied with disorder type from a high of 45.9% among respondents with Panic/Ago to a low of 23.9% among respondents with AUD. Prevalence of receiving treatment at the person level was dramatically lower in the absence of perceived need, 2.5%, ranging from 8.1% among respondents with Panic/Ago to 1.6% among those with SP. Receiving treatment, like perceived need, was positively associated with disorder severity, both in the presence of perceived need (39.6% for severe, 28.2% for moderate, and 18.1% for mild cases) and in the absence of perceived need (7.6% for severe, 2.1% for moderate, and 0.6% for mild cases). As noted previously, we asked about whether treatment was obtained with or without delay in the subsample of participants who sought treatment and had perceived need. Treatment was more likely to have occurred with than without a delay, both overall (17.9% of all participants with a disorder compared to 12.6% without a delay) and for each individual disorder.

#### **Barriers to treatment**

By far the most common barrier among respondents with perceived need who did not obtain treatment was low perceived disorder severity (52.9% among all respondents, 62.0% among those with at least 1 barrier reported) followed by low perceived effectiveness of available treatments (44.8% among all respondents, 52.6% among those with at least 1 barrier reported), barriers in the domain of enabling factors other than finances (40.2% among all respondents, 47.1% among those with at least 1 barrier reported), financial barriers (32.9% among all respondents, 38.6% among those with at least 1 barrier reported), and perceived stigma (20.6% among all respondents, 24.2% among those with at least 1 barrier reported) (Table 2). Low severity was also the most common reason for delay among respondents who obtained treatment with a delay (83.4% among all respondents, 85.4% among those with at least 1 barrier reported), followed by barriers in the domain of enabling factors other than finances (51.0% among all respondents, 52.2% among those with at least 1 barrier reported), low perceived effectiveness of available treatments (49.4% among all respondents, 50.6% among those with at least 1 barrier reported), perceived stigma (37.0% among all respondents, 37.9% among those with at least 1 barrier reported), and financial barriers (36.8% among all respondents, 37.7% among those with at least 1 barrier reported). Each of these five classes of barriers was significantly more likely to be reported as a reason for delaying help-seeking than for not seeking treatment at all  $(X_1^2 = 3.8 - 199.8, p = 0.050 - < 0.001)$ (Table 2). The number of reasons reported was also significantly higher for delaying (an average of 2.6 per

	Disorder prevalence	PN/dx	Treatment/PN +	Treatment/PN-	Treatment/total	Treatment without delay/ PN +	Treatment with delay/ PN+
	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)
I. Anxiety disorde	rs						
GAD	13.2 (0.4)	59.7 (1.5)	45.8 (2.0)	6.6 (1.1)	30.0 (1.4)	16.4 (1.3)	29.4 (1.7)
Panic/Ago	11.2 (0.4)	61.0 (1.5)	45.9 (1.8)	8.1 (1.3)	31.1 (1.4)	18.1 (1.6)	27.8 (1.8)
PTSD	9.2 (0.4)	56.7 (2.1)	45.1 (2.6)	5.6 (1.0)	28.0 (1.8)	15.5 (1.4)	29.6 (2.6)
SP	38.3 (0.7)	33.3 (0.9)	27.3 (1.2)	1.6 (0.3)	10.2 (0.5)	9.4 (0.8)	17.9 (1.1)
SoP	16.2 (0.4)	50.7 (1.4)	37.1 (1.8)	3.6 (0.7)	20.6 (1.1)	13.1 (1.3)	23.9 (1.5)
Any	67.6 (0.6)	40.7 (0.7)	33.2 (1.0)	2.5 (0.3)	15.0 (0.5)	12.8 (0.7)	20.4 (0.8)
II. Mood disorder	S						
MDD	31.3 (0.6)	55.8 (1.0)	39.1 (1.3)	5.5 (0.6)	24.2 (0.9)	16.8 (0.9)	22.3 (1.0)
BD	8.4 (0.3)	56.8 (1.9)	32.8 (2.2)	6.5 (1.4)	21.5 (1.4)	11.6 (1.6)	21.2 (1.8)
Any	39.7 (0.6)	56.0 (0.9)	37.8 (1.2)	5.7 (0.5)	23.7 (0.8)	15.7 (0.8)	22.0 (0.9)
III. Substance use	disorders						
AUD	14.0 (0.5)	33.8 (1.5)	23.9 (2.1)	2.7 (0.7)	9.8 (0.9)	7.6 (1.5)	16.3 (1.7)
DUD	4.1 (0.3)	46.0 (3.4)	31.5 (4.4)	5.9 (1.7)	17.7 (2.5)	8.2 (2.4)	23.3 (3.5)
Any	16.8 (0.5)	34.7 (1.5)	25.2 (2.0)	3.0 (0.6)	10.7 (1.0)	8.0 (1.3)	17.2 (1.6)
IV. Disorder sever	ity						
Severe	27.3 (0.6)	58.7 (1.1)	39.6 (1.4)	7.6 (0.8)	26.4 (1.0)	16.1 (0.9)	23.5 (1.1)
Moderate	38.6 (0.6)	41.9 (1.0)	28.2 (1.3)	2.1 (0.3)	13.0 (0.6)	11.3 (0.9)	16.9 (1.1)
Mild	34.1 (0.6)	25.1 (0.9)	18.1 (1.5)	0.6 (0.2)	5.0 (0.4)	8.6 (1.0)	9.5 (1.0)
V. Any disorder <sup>b</sup>	100.0 (-)	40.7 (0.6)	30.6 (0.8)	2.5 (0.2)	13.9 (0.4)	12.6 (0.5)	17.9 (0.6)
(n)	(11,622)	(11,622)	(5,136)	(6,486)	(11,622)	(5,136)	(5,136)

Tab	le 1	Twe	lve-mont	h treatment k	oy 12-mo	nth DSM	-IV/CID	I disorde	er and	perceived	l need v	vith and	d without (	delays <sup>a</sup>
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DSM-IV/CIDI disorders disorders assessed with the Composite International Diagnostic Interview (CIDI) based on DSM-IV criteria, *PN/dx* Perceived Need for treatment in the row diagnosis, *Treatment/PN* + Treatment among respondents with perceived need, *Treatment/PN*- Treatment among respondents with delay/*PN* + Treatment without delay given perceived need, *TC with delay/PN* + Treatment with delay given perceived need, % proportion of observation in the column total with the heading, *SE* the design-based standard error of % taking into consideration weighting and geographic clustering of observations, *GAD* generalized anxiety disorder, *Panic/Ago* Panic disorder or agoraphobia, *PTSD* post-traumatic stress disorder, *SP* specific phobia, *SoP* social phobia, *MDD* major depressive disorder, *BD* bipolar spectrum disorder, *AUD* alcohol use disorder (either misuse or dependence), *DUD* drug use disorder (either misuse or dependence), *Severe* the subset of respondents with either 12-month BP-I, AUD with a physiological dependence syndrome, DUD with a physiological dependence syndrome, suicide attempt, of self-reported severe role impairment due to their 12-month mental and/or substance use disorders; Moderate, the subset of respondents with a latent via for sepondents with a land/or substance use disorder (in = 11,622), the subsample of such respondents with a 12-month disorder (n = 11,622), the substangle of such respondents with perceived need (n = 5,136), or the subsample without perceived need (n = 6,486). Note that the observed proportion of respondents with perceived need (i.e., 5,136/11,622 = 44.2%) is higher than the 40.7% reported in the last row of the PN/dx column due to weighted data being used in analysis

<sup>a</sup> Pooled across all WMH surveys, with surveys weighted by sample size rather than by country population size

<sup>b</sup> Overall prevalence of any 12-month disorder in the total sample, considering all countries included, is 14.2%

respondent) than for not seeking treatment at all (an average of 1.9 per respondent).

Some understanding of the associations among barriers can be obtained by examining correlation matrices (Supplementary Table 2, Additional File 1), which showed that barriers were for the most part positively inter-correlated, but more strongly so for barriers to obtaining treatment than for barriers causing delays in help-seeking. The perception of low severity was the least correlated with other barriers for those who did not receive treatment. The perception of low treatment effectiveness was the least correlated with other barriers for those who had treatment delays. However, given that many respondents reported 3 + barriers (32.9% of respondents who did not obtain any treatment; 50.1% of those who obtained treatment with a delay), a better sense of the associations among barriers is provided in Venn diagrams (Fig. 1a, b). Note that these diagrams exclude the n=348 respondents in Table 2 who endorsed none of these reasons for not receiving treatment and the n=28 who endorsed none of these reasons for delayed treatment. Focusing first on respondents who did not obtain any treatment, by far the most common barrier among respondents who reported only one barrier was low perceived effectiveness (20.4% of all respondents; Fig. 1a). Among those who reported exactly two barriers, the great majority reported low disorder

	Barriers to tre	atment <sup>a</sup>	Barriers to tin	nely treatment <sup>b</sup>	Significance of difference between		
	Among all respondents	Among respondents with at least one barrier	Among all respondents	Among respondents with at least one barrier	proportional barriers to treatment and to timely treatment $\overline{\chi^2_{1/5}}$		
	% (SE)	% (SE)	% (SE)	% (SE)			
I. Types of barriers							
Low perceived severity	52.9 (1.2)	62.0 (1.2)	83.4 (1.2)	85.4 (1.2)	199.8*		
Financial	32.9 (1.1)	38.6 (1.2)	36.8 (1.5)	37.7 (1.5)	3.8		
Other enabling factors	40.2 (1.2)	47.1 (1.4)	51.0 (1.6)	52.2 (1.7)	28.1*		
Low perceived treat- ment effectiveness	44.8 (1.2)	52.6 (1.3)	49.4 (1.7)	50.6 (1.7)	3.8		
Perceived Stigma	20.6 (0.9)	24.2 (1.1)	37.0 (1.7)	37.9 (1.8)	62.8*		
II. Number of barriers							
0 <sup>c</sup>	14.8 (0.9)	-	2.3 (0.5)	-	137.3*		
1	35.9 (1.2)	42.1 (1.3)	24.0 (1.6)	24.5 (1.6)	_		
2	16.4 (0.8)	19.2 (0.9)	23.6 (1.6)	24.2 (1.5)	_		
3	14.7 (0.9)	17.3 (1.1)	22.6 (1.4)	23.2 (1.3)	-		
4	12.7 (0.8)	14.9 (0.9)	18.8 (1.3)	19.3 (1.3)	-		
5	5.5 (0.5)	6.5 (0.6)	8.6 (0.9)	8.8 (0.9)	_		
(n)	(2,444)	(2,096)	(926)	(898)	_		

Table 2 Barriers to receiving 12-month treatment and timely treatment

Low perceived severity thinking that the problem would get better on its own or the problem not very bothersome, a/o wanting to handle problem on own, Financial reporting insurance would not pay for treatment a/o concerns about not being about to afford treatment, Other enabling factors reporting nonfinancial barriers in the domain of enabling factors involving either having problems with things like transportation or scheduling that made it hard to get to treatment, being unsure about where to go or who to see, thinking that treatment would take too much time or be inconvenient, a/o not being able to get an appointment, Low perceived treatment effectiveness reporting either not being satisfied with available treatments, not thinking treatment will work, a/o having been in treatment in the past and not finding it helpful, Perceived stigma reporting either concern about what people would think if they found out the patient was in treatment a/o worry about being involuntarily committed to a hospital % proportion of respondents in the column who reported the barrier, SE design-based standard error of %

<sup>a</sup> Pooled across all WMH surveys among respondents with perceived need who did not receive any 12-month treatment and were asked about reasons. Note that those with perceived need for less than 4 weeks were not asked reasons for not seeking treatment (n = 1,027). Another 70 respondents missing a response on the duration question were also excluded

<sup>b</sup> Pooled across all WMH surveys in the subsample of respondents with perceived need for treatment who received 12-month treatment with a delay and were asked about reasons for the delay

<sup>c</sup> Respondents with 0 reasons either responded "No" to all reasons (n = 307 of those receiving no treatment; 23 among those with delayed treatment) or were missing on all reasons (n = 41 of those who received no treatment and n = 5 of those with delayed treatment)

severity as a barrier in conjunction with either barriers in the domain of enabling factors other than finances (5.6%), low perceived treatment effectiveness (4.3%), or financial barriers (2.2%). The most common profiles involving three barriers all included low disorder severity as well. A similar pattern occurred in the profiles including four barriers, where the one excluding low severity (0.9%) and another excluding nonfinancial barriers in the domain of enabling factors (0.9%) were much less common than the other profiles (3.4–5.4%). The final 6.4% of respondents with barriers reported all five types.

The situation was different for barriers leading to delays in obtaining treatment (Fig. 1b), where 2.3% of respondents reported none of the barriers and 24.0% reported only one. Low perceived severity was by far the most common of these exclusive barriers (15.3%) followed by low perceived treatment effectiveness (4.6%). The most common two-barrier profile was low perceived severity in conjunction with low perceived treatment effectiveness, while the most common profiles involving three barriers included a combination of low perceived severity, low perceived treatment effectiveness and barriers in the domain of enabling factors other than finances. The most common profile involving four barriers was the one that added stigma to the most common three-barrier combination. The final 8.7% of respondents reported all five types of barriers.

#### Predictors of treatment and barriers

A series of univariable and multivariable models was estimated to predict receiving treatment in the sample of those with a 12-month disorder and perceived need who either received treatment or who were asked about reasons for not receiving treatment (n=4039). The analysis excluded the subset of respondents without treatment who were either skipped out of the questions about reasons inadvertently or because their recognition of need began only recently. Three broad classes of



**Fig. 1** Associations among reported barriers to treatment and to timely treatment<sup>a</sup>. <sup>a</sup> Note that the percentages shown here are among respondents with at least 1 reason. <sup>b</sup> As mentioned in Table 2, respondents with at least 1 12-month disorder who reported that they had perceived need for less than 4 weeks in the past 12 months weren't asked reasons for not seeking treatment. In addition, this figure excluded 348 respondents who reported 0 of the 5 reason domains. Among those who reported at least 1 barrier out of the 5 reasons domains, 62.0% reported low severity, 38.6% reported financial factors, 47.1% reported enabling factors, 52.6% reported low perceived effectiveness, 24.2% reported perceived stigma. <sup>c</sup> This figure excluded 28 respondents who reported 0 of the 5 reason domains. Among those who reported at least 1 barrier out of the 5 reasons domains, 85.4% reported low severity, 37.7% reported financial factors, 52.2% reported enabling factors, 50.6% reported low perceived effectiveness, 37.9% reported perceived stigma

individual-level predictors were used in these models: socio-demographics (Supplementary Table 3, Additional File 1), disorder type and severity (Supplementary Table 4, Additional File 1), history of prior treatment (Supplementary Table 5, Additional File 1), and country-level predictors (Supplementary Table 6, Additional File 1). We then estimated a summary model that combined the significant predictors across all those domains (Table 3). These significant predictors were then used to predict each type of barrier to receiving treatment (Supplementary Table 7, Additional File 1) and of treatment delay (Supplementary Table 8, Additional File 1). Finally, we examined the extent to which deleting the subset of respondents who reported one set of barriers at a time would help explain the associations of significant predictors with receiving treatment (Table 4) and doing so without delay (Table 4).

We focused first on the statistically significant predictors of treatment (Table 3) based on preliminary analyses reported in Supplementary Tables 3–6. These significant predictors included per capital number of non-psychiatrists MDs in the country (RR=1.1), education (coded for all categories other than high; RR=0.9), having health insurance (RR=1.5), several different types of disorder (Panic/Ago, GAD, PTSD, MDD, BD; RR=1.1-1.4), disorder severity (RR=1.2-1.3), and information about number and types of providers seen in the past, as well as the perceived helpfulness of that previous treatment. The elevated RRs for socio-demographics and severity were intuitive, as less educated respondents were less likely to receive treatment, and those who had health insurance and severe cases were more likely to receive treatment. The elevated RRs for disorder type indicated that treatment was significantly more likely for respondents with these disorders than other disorders. The interpretation of the coefficients for providers, in comparison, was somewhat more complex because we included terms both for the types of providers seen in the past, all of which had RRs significantly less than 1.0 (RR = 0.5 - 0.6;  $X_{5}^{2}$  = 45.8, p < 0.001) and a count of the number of types of providers seen in the past. The latter were all significant individually and increased monotonically with number of types of providers seen in the range between 2 and 5 (RR=2.3–15.9;  $X_4^2$ =32.7, p<0.001). The RRs of 0.5-0.6 for provider types indicated that probability of 12-month treatment was significantly lower and comparable across provider types for respondents with a history of having seen one and only one type of provider in the past than among those who saw none prior to the past 12 months. The RRs of 2.3-15.9 for the number of prior lifetime treatment providers, in comparison, indicated that probability of receiving 12-month treatment

Total Other enabling Low perceived Low perceived severity Financial Perceived stigma treatment effectiveness RR (95% CI) I. Socio-demographics Education not high 0.9\* (0.8-1.0) 0.9\* (0.9-1.0) 0.9\* (0.8-1.0) 0.9 (0.9-1.0) 1.0 (0.9-1.0) 0.9\* (0.8-1.0) X<sup>2</sup><sub>1</sub> 8.7\* 5.1\* 4.7\* 3.6 1.2 5.7\* 1.3\* (1.1-1.6) 1.4\* (1.2–1.7) Health insurance 1.5\* (1.2-1.8)  $1.3^{*}(1.1-1.5)$ 1.4\* (1.1-1.7) 1.1 (0.9–1.3) X<sup>2</sup><sub>1</sub> 13.9\* 12.6\* 1.3 10.1\* 11.1\* 14.0\* Group X<sup>2</sup><sub>2</sub> 28.7\* 19.5\* 6.3\* 14.8\* 13.6\* 22.8\* II. 12-month DSM-IV/CIDI disorders GAD  $1.1^{*}(1.0-1.2)$ 1.0(1.0-1.1)1.1\* (1.0-1.2) 1.1\* (1.0-1.2) 1.0(1.0-1.1)1.1(1.0-1.2)X<sup>2</sup><sub>1</sub> 4.6\* 0.8 5.7\* 5.1\* 12 2.9 Panic/Ago 1.2\* (1.1-1.3) 1.2\* (1.1-1.3) 1.2\* (1.1-1.3) 1.2\* (1.1-1.3) 1.2\* (1.1-1.3) 1.2\* (1.1-1.3) X<sup>2</sup><sub>1</sub> 20.0\* 23.7\* 22.1\* 19.9\* 22.4\* 23.5\* PTSD 1.1\* (1.0-1.2) 1.1\* (1.0-1.2) 1.1\* (1.0-1.2) 1.1\* (1.0-1.2) 1.1\* (1.0-1.2) 1.2\* (1.1-1.3) X<sup>2</sup><sub>1</sub> 3.9\* 5.3\* 5.5\* 6.4\* 7.1\* 11.7\* MDD 1.4\* (1.3-1.6) 1.3\* (1.2-1.5) 1.4\* (1.3-1.6) 1.4\* (1.2-1.5)  $1.3^{*}(1.2-1.4)$ 1.4\* (1.2-1.5) X<sup>2</sup><sub>1</sub> 48.2\* 51.2\* 43.0\* 51.0\* 36.8\* 43.2\* BD 1.1 (1.0-1.3) 1.2\* (1.0-1.3) 1.2\* (1.1-1.3) 1.1 (1.0-1.3) 1.0 (0.9-1.2) 1.1 (1.0-1.3) X<sup>2</sup><sub>1</sub> 4.3\* 8.0\* 3.1 3.3 0.3 3.6 Group X<sup>2</sup><sub>5</sub> 82.1\* 80.8\* 89.9\* 84.4\* 82.3\* 85.5\* Disorder severity (compared to mild) 1.3\* (1.1-1.5) 1.2\* (1.0-1.3) 1.4\* (1.2-1.6) 1.3\* (1.1-1.5) 1.3\* (1.1-1.4) 1.3\* (1.1-1.5) Severe Moderate 12 1.1 (1.0-1.3) 1.2\* (1.0-1.4) 1.2\* (1.0-1.4) 1.1 (1.0-1.3) 1.2 (1.0-1.4) (1.0 - 1.4)X<sup>2</sup><sub>2</sub> 17.8\* 15.4\* 17.2\* 12.7\* 7.3\* 16.8\* III. History of prior treatment Types of providers Psychiatrist 0.6\* (0.5-0.8) 0.7\* (0.6-0.9) 0.6\* (0.5-0.8) 0.7\* (0.5-0.9) 0.7\* (0.5-0.8) 0.6\* (0.5-0.8) Other mental health 0.5\* (0.4-0.7) 0.7\* (0.5-0.8) 0.6\* (0.5-0.8) 0.6\* (0.5-0.8) 0.6\* (0.5-0.8) 0.5\* (0.4-0.7) General medical 0.6\* (0.4-0.7) 0.7\* (0.5-0.9) 0.6\* (0.5-0.7) 0.6\* (0.5-0.8) 0.6\* (0.5-0.8) 0.6\* (0.4-0.7) Human services 0.6\* (0.5-0.8) 0.7\* (0.5-0.9) 0.7\* (0.5-0.9) 0.6\* (0.5-0.8) 0.8 (0.6-1.0) 0.6\* (0.5-0.8) CAM 0.5\* (0.4-0.6) 0.6\* (0.5-0.8) 0.5\* (0.4-0.7) 0.6\* (0.4-0.7) 0.5\* (0.4-0.7) 0.5\* (0.4-0.6)  $X_{5}^{2}$ 45.8\* 20.1\* 29.8\* 24.7\* 38.2\* 42.9\* Number of provider types 2 2.3\* (1.7-3.1) 1.7\* (1.3-2.3) 2.0\* (1.6-2.6) 1.9\* (1.5-2.6) 2.0\* (1.5-2.6) 2.2\* (1.7-3.0) 3 4.4\* (2.6-7.4) 2.6\* (1.6-4.2) 3.5\* (2.2-5.7) 3.1\* (1.9-5.1) 3.3\* (2.0-5.4) 4.2\* (2.5-7.1) 4 7.9\* (3.7-17.0) 3.6\* (1.8-7.3) 6.1\* (3.0-12.4) 5.0\* (2.4-10.4) 5.6\* (2.8-11.4) 7.4\* (3.4-16.2) 5 15.9\* (5.6-44.5) 5.5\* (2.1-14.4) 10.9\* (4.2-28.7) 8.2\* (3.0-22.2) 9.6\* (3.7-24.6) 14.4\* (5.0-41.5) X<sup>2</sup><sub>4</sub> 19.2\* 32.7\* 28.6\* 24.2\* 25.4\* 30.3\* Helpfulness of prior treatment Helpful tx for any 12-mo dx 3.1\* (2.5-4.0) 2.2\* (1.7-2.7) 2.9\* (2.3-3.6) 2.6\* (2.1-3.3) 2.5\* (2.1-3.2) 2.9\* (2.3-3.7) Unhelpful tx for any 12-mo 1.9\* (1.5-2.5) 1.6\* (1.3-2.0) 1.9\* (1.5–2.4) 1.8\* (1.4-2.3) 2.1\* (1.6-2.6) 2.0\* (1.5-2.5) dx X<sup>2</sup>, 153.1\* 85.4\* 156.7\* 121.1\* 92.8\* 133.2\* IV. Country-level variables<sup>b</sup> Non-psychiatrist MDs/ 1.1 (1.1-1.2) 1.1\* (1.1-1.2) 1.1\* (1.0-1.1) 1.1\* (1.0-1.1) 1.1\* (1.1-1.2) 1.1\* (1.0-1.1) population X<sup>2</sup><sub>1</sub> 26.3\* 18.7\* 7.5\* 5.0\* 9.8\* 26.8\* (n) (4039) (2721) (3219) (3006) (2930) (3521)

**Table 3** Statistically significant pooled within-country and country-level predictors of 12-month treatment mediated through barriers<sup>a</sup>

# Table 3 (continued)

Total all respondents with 12-month DSM-IV/CIDI disorders and perceived need excluding those missing reasons (n = 1,097), Low perceived severity excluding those who did not obtain any 12-month treatment and reported low perceived severity, Financial excluding those who did not obtain any 12-month treatment and reported financial reasons for not doing so, Other enabling excluding those who did not obtain any 12-month treatment and reported nonfinancial barriers in the domain of enabling factors, Low perceived treatment effectiveness excluding those who did not obtain any 12-month treatment and reported low perceived treatment effectiveness, Stigma excluding those who did not obtain any 12-month treatment and reported low perceived treatment effectiveness, Stigma excluding those who did not obtain any 12-month treatment and reported low perceived treatment effectiveness, Stigma excluding those who did not obtain any 12-month treatment and reported low perceived treatment using a Poisson link function for pooled within-country associations of the predictors with the outcome, 95% CI design-based 95% confidence interval of RR taking into consideration the weighting and geographic clustering of the WMH data, See footnotes to earlier tables for abbreviations of predictors; n, the 4,039 respondents with 12-month disorders, perceived need, and asked about reasons for not seeking treatment. The smaller numbers in the remaining columns reflect the exclusion of respondents who did not obtain any 12-month treatment and reported the reasons indicated by the column heading

<sup>a</sup> Based on multivariable Poisson regression models to predict 12-month treatment across all WMH surveys, with surveys weighted by sample size rather than by country population size with dummy variables for country included as controls, allowing coefficients to be interpreted as pooled weighted within-country coefficients. Respondents with none of the five barriers are kept in the sample for the regression models and coded to 0

<sup>b</sup> Results are from a separate model controlling for the same predictors but including the country-level variables as an additional predictor

\* Significant at the 0.05 level, two-sided design-based test

**Table 4** Statistically significant pooled within-country and country-level predictors timely (versus delayed) 12-month treatment mediated through barriers<sup>a</sup>

	Total	Low perceived severity	Financial	Other enabling	Low perceived treatment effectiveness	Perceived stigma	
	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)	
I. Socio-demographics							
Age 18–59	0.8* (0.6–1.0)	0.9* (0.8–0.9)	0.8* (0.7–1.0)	0.8* (0.7–1.0)	0.9 (0.7–1.0)	0.8* (0.6–0.9)	
X <sup>2</sup> 1	5.8*	11.2*	5.8*	4.6*	2.6	8.0*	
Employment status (compared	to employed)						
Homemaker	1.3* (1.0–1.7)	1.1 (1.0–1.2)	1.2 (0.9–1.5)	1.3* (1.0–1.6)	1.2* (1.0–1.5)	1.3* (1.1–1.6)	
Retired	1.3* (1.0–1.7)	1.0 (0.9–1.1)	1.1 (0.9–1.4)	1.1 (0.9–1.4)	1.2* (1.0–1.5)	1.2 (1.0–1.5)	
Student	1.6* (1.2–2.2)	1.1 (1.0–1.3)	1.3 (1.0–1.8)	1.4* (1.1–1.8)	1.4* (1.1–1.8)	1.5* (1.2–2.0)	
Disabled/Other/Unem- ployed	1.2 (1.0–1.5)	1.0 (0.9–1.1)	1.1 (0.9–1.3)	1.2* (1.0–1.4)	1.2* (1.0–1.4)	1.3* (1.1–1.5)	
$X_{4}^{2}$	13.4*	5.3	5.2	11.7*	10.9*	14.6*	
II. 12-month DSM-IV/CIDI disorder	S						
GAD	0.8* (0.7–0.9)	1.0 (0.9–1.1)	0.9* (0.8–1.0)	0.9 (0.8–1.0)	0.8* (0.7–1.0)	0.9* (0.7–1.0)	
X <sup>2</sup> 1	7.5*	0.9	4.2*	3.5	7.3*	5.0*	
SP	0.8* (0.7–1.0)	0.9 (0.8–1.0)	0.9 (0.8–1.1)	0.9 (0.8–1.0)	0.9 (0.8–1.0)	0.9 (0.8–1.1)	
X <sup>2</sup> 1	5.6*	1.4	1.0	2.5	3.0	1.1	
Group X <sup>2</sup> <sub>2</sub>	12.0*	2.2	4.8	5.1	9.6*	5.5	
III. Country-level variables <sup>b</sup>							
Healthcare spending/GDP	0.9* (0.9–1.0)	1.0 (1.0–1.0)	0.9* (0.9–1.0)	0.9* (0.9–1.0)	0.9* (0.9–1.0)	0.9* (0.9–1.0)	
X <sup>2</sup> 1	11.7*	0.6	6.8*	13.2*	8.1*	6.0*	
(n)	(1595)	(829)	(1240)	(1116)	(1139)	(1260)	

*Total* the total sample with one or more 12-month disorders and perceived need who received treatment, *Low perceived severity* the total sample excluding those with treatment delay who reported low perceived severity as one or the reasons for doing so, *Financial* the total sample excluding those with treatment delay who reported financial barriers as one or the reasons for doing so, *Other enabling* the total sample excluding those with treatment delay who reported nonfinancial barriers as one or the reasons for doing so, *Low perceived treatment effectiveness* the total sample excluding those with treatment delay who reported low perceived treatment effectiveness as one of the reasons for doing so, *Stigma* the total sample excluding those with treatment delay who reported low perceived treatment effectiveness as one of the reasons for not doing so, *Stigma* the total sample excluding those with treatment delay who reported perceived stigma as one or the reasons for doing so, *RR* risk-ratio predicting 12-month treatment contact without a delay (coded 1) versus with a delay (coded 0) based on a multivariable regression model using a Poisson link function for pooled within-country associations of the predictors with the outcome, *95% CI* design-based 95% confidence interval of RR taking into consideration the weighting and geographic clustering of the WMH data; DSM-IV/CIDI disorders, disorders assessed with the Composite International Diagnostic Interview (CIDI) based on DSM-IV criteria, see earlier tables for description of abbreviations; n, 1,595 respondents had one or more 12-month treatment, whereas the smaller numbers in the remaining columns reflect the exclusion of respondents who obtained treatment with a delay and reported the reasons for delay indicated by the column heading

<sup>a</sup> Based on multivariable Poisson regression models, with surveys weighted by sample size and dummy variables for country, allowing coefficients to be interpreted as pooled weighted within-country coefficients. Respondents with none of the five barriers are kept in the sample for the regression models and coded to 0

<sup>b</sup> Results are from a separate model controlling for the same predictors but including the country-level variables as an additional predictor

\* Significant at the 0.05 level, two-sided design-based test

was significantly higher among respondents who saw between 2 and all 5 types of providers than among those who saw none prior to the past 12 months. Finally, the RRs for the experiences in those prior treatment episodes indicated that participants were more likely to have 12-month treatment if they previously obtained what they perceived to be helpful treatment for one or more of their current 12-month disorders (RR=3.1) or even unhelpful treatment for those disorders (RR=1.9) than if their prior treatment was only for other unspecified mental disorders.

As noted previously, we examined the associations of the same predictors with reported barriers in the subsample of respondents with perceived need who did not obtain any 12-month treatment (Supplementary Table 6, Additional File 1). A clearer sense of the extent to which these barriers help account for the significant associations of these predictors with treatment, can be had by examining the coefficients in the model predicting 12-month treatment after excluding the respondents without treatment who reported different barriers. That analysis showed that the reduced RR for lower education disappears only when we exclude from the sample the respondents who did not receive treatment because they felt that available treatments were ineffective or with nonfinancial barriers in the domain of enabling factors (Table 3). This was indicated most clearly by noting that the  $X^2$  for education decreases from a significant  $X_{1}^{2}=8.7$  in the initial model to predict 12-month treatment to nonsignificant  $X_{1}^{2}=3.6$  and  $X_{1}^{2}=1.2$ , respectively, when we exclude from the sample the respondents who reported nonfinancial barriers in the domain of enabling factors or did not obtain treatment because they thought available treatments were not effective. Similarly, the positive association of health insurance with treatment ( $X^2 = 13.9$ ) disappeared when we excluded from the sample respondents who reported that financial barriers were an impediment to seeking treatment ( $X^2 = 1.3$ ).

The exceptions to this were with the associations of GAD and BD. The perceptions of low perceived treatment effectiveness and perceived stigma mediated the associations of both these disorders with treatment, whereas financial and other barriers in the domain of enabling factors mediated the association of BD and low perceived severity mediated the association of GAD with treatment. None of the barriers considered here mediated the elevated RRs of some disorders relative to others or of disorder severity. The same was true for the reduced RRs associated with provider types, which remained relatively unchanged when we sequentially excluded from the sample respondents with each of the barriers. The highly elevated RRs associated with previously having seen 4–5 types of providers (RR=7.9–15.9) were reduced but remained significant when we excluded respondents who reported each barrier. This occurred especially when we excluded respondents who reported low severity as a barrier (RR=3.6-5.5). A similar pattern was found for the elevated RRs associated with perceptions of past treatment helpfulness.

# Predictors of timely treatment and barriers accounting for delays

The same series of univariable and multivariable models as described above for 12-month treatment was estimated to predict receiving timely versus delayed 12-month treatment among those who obtained 12-month treatment (n = 1595). Initial models were estimated separately for socio-demographics (Supplementary Table 3, Additional File 1), disorder type and severity (Supplementary Table 4, Additional File 1), history of prior treatment (Supplementary Table 5, Additional File 1), and countrylevel predictors (Supplementary Table 6, Additional File 1) followed by a summary model that combined the significant predictors across all those domains (Table 4). And the same significant predictors of delays were then used to predict barriers reported as reasons for these delays (Supplementary Table 8, Additional File 1) along with models for the extent to which deleting one set of barriers at a time would help explain the associations of significant predictors with delays (Table 4). We focused first on the predictors of obtaining treatment without delay versus with delay. The significant associations here were much less extensive than in predicting not receiving 12-month treatment: an inverse association with age (RR = 0.8), elevated RRs of all employment statuses other than being employed, most notably for students (RR = 1.6), inverse associations with GAD and SP (both RR = 0.8), and an inverse association with the proportion of GDP spent on healthcare (RR=0.9. It is noteworthy that we adjusted for the fact that we made multiple tests by evaluating the joint significance of the full set of sociodemographics ( $X_{13}^2$ =45.2, p<0.001) and 12-month disorder-related predictors ( $X_{11}^2 = 22.3$ , p=0.026), both of which were significant, along with the predictors related to history of prior treatment ( $X_{13}^2 = 14.5$ , p = 0.35), which were not significant. The significant inverse association of age with 12-month treatment  $(X_1^2 = 5.8)$  was mediated by perceived effectiveness of treatment  $(X_1^2 = 2.6)$ . The significant associations involving employment status  $(X^2 = 13.4)$  were mediated by financial barriers  $(X^2_1 = 5.2)$ and low perceived severity of disorders ( $X^2 = 5.3$ ). The significant association for GAD ( $X^2 = 7.5$ ) was mediated by low perceived severity  $(X^2=0.9)$  and nonfinancial barriers in the domain of enabling factors ( $X^2 = 3.5$ ). The significant association of SP ( $X^2 = 5.6$ ) was no longer significant after dropping each barrier one at a time

 $(X^2=1.0-3.0)$ . The significant association for the proportion of GDP spent on healthcare was mediated by low perceived disorder severity ( $X^2=0.6$ ).

The current report builds on previous research by examining barriers among respondents with 12-month disorders who either failed to obtain treatment or who did so with a delay. We found somewhat different distributions of barriers in the two groups but with low perceived disorder severity reported most often and stigma reported much less often than most other reasons in both cases. We also investigated the extent to which previously documented predictors of obtaining treatment and doing so without delay were explained by the barriers considered here.

Our results about the distribution of barriers extend prior work with the WMH data by documenting the existence of a wide range of barriers, with most respondents reporting multiple barriers [39–41]. As noted in prior reports, only a minority (about 40%) of WMH respondents with 12-month disorders perceived themselves as needing treatment [17] and receiving treatment was extremely low in the absence of perceived need [18]. Increased screening for mental disorders and public education initiatives are needed to improve self-awareness and recognition of symptoms [45, 46].

We know from our own work as well as from other prior studies [47–50] that perceived need for treatment increases with severity and comorbidity. Our current results underscore this finding and raise the possibility that perceived severity given the recognition of need is a critical determinant of treatment seeking. Among the key challenges in promoting timely help-seeking is to convince people that non-severe versions of problems often become more severe over time and are more easily addressed before they become severe.

Improving knowledge and attitudes required to recognize, manage, and prevent mental disorders, along with appropriate help-seeking behaviors, might also be important not only for increasing perceived need but for increasing awareness of the importance of timely help-seeking. It is noteworthy in this regard that mental health literacy training programs have been developed and implemented with promising results along with broader psycho-educational interventions that have also demonstrated success in promoting timely help-seeking. However, it is not clear whether this has been because these interventions combat myths about treatment effectiveness or stigma rather than about the importance of timely treatment [45, 46].

Consistent with other research [39–41], we also found in the current report that a wide range of barriers involving both psychological and practical factors were reported by the people who failed to obtain treatment as well as among those who delayed help-seeking. Financial barriers, although the focus of considerable attention in the literature on barriers to treatment of mental disorders [25, 51], were reported by only about one-third of the respondents who failed to get treatment (32.9% among all respondents, 38.6% among those with at least 1 barrier reported) or delayed treatment (36.8% among all respondents, 37.7% among those with at least 1 barrier reported). This is consistent with an earlier WMH analysis that found income not to be a significant predictor of 12-month treatment, while education was a significant predictor [9].

Consistent with our finding that financial barriers were less important than suggested by commentators on the importance of socio-economic status, we found that education was important because of its association with the perception that treatment is effective rather than because of reduced reports of financial barriers to treatment. Specifically, low perceived disorder severity, not financial barriers, was the barrier reported by the highest proportion of respondents both for not seeking treatment (52.9% among all respondents, 62.0% among those with at least 1 barrier reported) and for delaying help-seeking (83.4% among all respondents, 85.4% among those with at least 1 barrier reported), suggesting that education is important to help-seeking because it is associated with health literacy. It is noteworthy in a similar way that analyses in an earlier report found that it was education rather than family income that accounted for the association of socio-economic status with help-seeking [9]. This is why education was the indicator of socio-economic status used in the current report and why income was not included as a predictor.

Another important result is that objectively assessed disorder severity was not correlated with reports of low severity as a barrier. This seemingly inconsistent finding can be explained by the fact that a key component in perceived severity is the belief that the disorder will get better on its own and that time will heal. This is quite different from the perception that current severity is low, indicating that public education programs should focus on the recurring nature of clinically significant psychological distress. We need to underscore that problems often do not remit on their own and that even when spontaneous remission does occur, these problems tend to recur and that treatment during the acute phase can be useful not only in leading to more rapid remission but also in preventing recurrence.

Consistent with the results of our previously reported analysis of receiving treatment at the level of the persondisorder [18], we documented here that there were statistically significant but substantively modest associations of some socio-demographic variables with both obtaining 12-month treatment and doing so without delays. We found stronger associations of 12-month disorder characteristics and history of prior treatment with obtaining treatment, but only a small number of modest predictive associations of socio-demographics and type of disorders with treatment delays. Although we found that some of these associations could be accounted for by single barriers, this was for the most part not the case.

Taken together, these results suggest that programs designed to reduce unmet need for treatment need to go beyond considering financial barriers, the focus of many such programs, even though the evidence is fairly clear that expanding treatment coverage can lead to increases in treatment of mental disorders [52, 53] despite some unanticipated negative effects [54]. The wider range of barriers involve subjective perceptions, most notably the inaccurate beliefs that treatments for emotional problems do not work and that clinically significant emotional problems typically resolve on their own or can be managed without professional help. They also involve practical barriers other than finances. It is noteworthy that among the other practical barriers are some, most notably insufficient numbers of treatment providers, that can be addressed with financial interventions for the treatment providers. However, even if access problems are addressed, additional public education interventions will be needed to address the perception that treatments for emotional problems do not work and the perception that clinically significant emotional problems get better on their own. The only way to address this problem of multiple barriers is to develop multi-component interventions that focus on reducing both objective and subjective barriers.

Several limitations of this report deserve emphasis. First, the WMH data on service use, including perceived helpfulness, were based on self-reports, and so were subject to bias, including memory bias [24]. We cannot be certain, for example, that the need for treatment was perceived before treatment or whether receiving treatment with delays reinforced the perception of need or influenced reports about prior barriers. Second, the focus here was on a limited number of mental disorders. This means that findings may not generalize to other conditions, such as externalizing disorders other than substance use disorders or psychotic disorders. Third, some comparisons and measures of association lacked statistical power because they were based on small subsamples. Fourth, as noted above, our analysis of barriers was limited relative to our prior investigation of the predictors of receiving treatment [18] due to the fact that even though the WMH survey asked about treatment of each 12-month disorder separately, allowing a person-disorder level of analysis in examining patterns and predictors of 12-month treatment, questions about barriers were asked only of the respondent level. This means that we were unable to investigate the reasons individuals with comorbid conditions sought treatment for one type of disorder (e.g., MDD) but not another (e.g., AUD). Further, we did not consider comorbidity and number of 12-month disorders in our predicting factors, although some comorbid conditions were included in the clinical severity classification we created. In addition, questions about barriers to treatment were asked only of respondents with 12-month disorders who reported perceived need for treatment, whereas our previously reported investigation of predictors of receiving treatment was carried out in parallel among respondents with and without perceived need for treatment. We have not looked at the rates and reasons for dropping out of treatment among those who received treatment with or without delays. Dropping out can be viewed as another barrier to receiving adequate care and represents a bottleneck in the treatment cascade. Finally, we presented a consolidated analysis across all countries, without examining cross-national variation either in the distribution of barriers or in the mediating effects of barriers. This approach may have masked variations arising from differences in healthcare systems across countries.

Despite these limitations, the current report is noteworthy for being based on a sample representative of the general population across 19 countries that used a validated structured diagnostic interview of key mental disorders, assessed a wide range of barriers, and examined the extent to which these barriers account for associations of multiple previously documented predictors of receiving treatment [18].

## Conclusions

Three broad conclusions can be drawn from these results. First, a wide range of barriers to treatment exist among people in the general population with mental disorders even after a need for treatment is recognized. Second, these barriers are diverse, widespread in the population, and not strongly associated with the socio-economic barriers that have been the focus of much attention in the literature. Third, a high proportion of people who failed to seek treatment or delayed in doing so had multiple barriers, meaning that efforts to increase treatment by focusing on only one key barrier would be doomed to fail. These results argue strongly for future policy interventions designed to reduce unmet treatment needs for mental disorders. Among the important foci of such interventions should be addressing the low rates of perceived need for treatment among individuals with mental disorders and the high prevalence of the inaccurate view that treatments of mental disorders are not effective.

#### Abbreviations

AUD	Alcohol use disorder
BD	Bipolar spectrum disorder
CIDI	Composite International Diagnostic Interview
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, Fourth
	Edition
DUD	Drug use disorder
GAD	Generalized anxiety disorder
HIC	High-income countries
ICD-10	International Classification of Diseases 10th revision
LMIC	Low- or middle-income countries
MDD	Major depressive disorder
Panic/Ago	Panic disorder and/or agoraphobia
SoP	Social phobia
SP	Specific phobia
PTSD	Post-traumatic stress disorder
WMH	World Mental Health

# **Supplementary Information**

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Supplementary material 1.

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#### Author contributions

MCV, RCK, AEK, and DVV conceived the study, provided overall guidance and prepared the first draft. MCV, AEK, MGH, DJS, DVV, IH, SMM, NAS, JA, LHA, GB, BB, JM-CDA, GDG, PDJ, OG, JMH, EGK, V-KM, JM, F-NM, DN, MP, J-PV, KMS, CV, BW, ZZ, RCK provided data. NAS supervised data analyses. IH and SMM conducted data analyses. All authors collaborated in interpreting results and contributed to the preparation of the report.

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complete list of all within-country and cross-national WMH publications can be found at http://www.hcp.med.harvard.edu/wmh/.

#### Availability of data and materials

Access to the cross-national World Mental Health (WMH) data is governed by the organizations funding and responsible for survey data collection in each country. These organizations made data available to the WMH consortium through restricted data sharing agreements that do not allow us to release the data to third parties. The exception is that the U.S. data are available for secondary analysis via the Inter-University Consortium for Political and Social Research (ICPSR), http://www.icpsr.umich.edu/icpsrweb/ICPSR/series/00527.

#### Declarations

#### Ethics approval and consent to participate

At all survey sites, the local ethics or institutional review committee reviewed and approved the protocol to ensure protection of human subjects, in line with appropriate international and local guidelines. Details of the ethics committees for the WMH surveys can be viewed at this link: http://www.hcp.med. harvard.edu/wmh/ftpdir/WMH\_Ethics\_approval.pdf.

#### **Consent for publication**

Not applicable.

#### **Competing interests**

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#### References

- McGrath JJ, Al-Hamzawi A, Alonso J, Altwaijri Y, Andrade LH, Bromet EJ, et al. Age of onset and cumulative risk of mental disorders: a crossnational analysis of population surveys from 29 countries. Lancet Psychiatry. 2023;10(9):668–81.
- Stein DJ, Jonge JD, Kessler RC, Scott KM. The cross-national epidemiology of mental disorders mental disorders around the world: facts and figures from the WHO World Mental Health surveys. New York: Cambridge University Press; 2018. p. 3–8.
- Lebrun-Harris LA, Ghandour RM, Kogan MD, Warren MD. Five-year trends in US children's health and well-being, 2016–2020. JAMA Pediatr. 2022;176(7):e220056.
- Martins SS, Sarvet A, Santaella-Tenorio J, Saha T, Grant BF, Hasin DS. Changes in US lifetime heroin use and heroin use disorder: prevalence from the 2001–2002 to 2012–2013 National Epidemiologic Survey on Alcohol and Related Conditions. JAMA Psychiat. 2017;74(5):445–55.
- Patalay P, Gage SH. Changes in millennial adolescent mental health and health-related behaviours over 10 years: a population cohort comparison study. Int J Epidemiol. 2019;48(5):1650–64.
- Twenge JM, Joiner TE, Rogers ML, Martin GN. Increases in depressive symptoms, suicide-related outcomes, and suicide rates among US adolescents after 2010 and links to increased new media screen time. Clin Psychol Sci. 2018;6(1):3–17.
- Cuijpers P, Miguel C, Harrer M, Plessen CY, Ciharova M, Ebert D, et al. Cognitive behavior therapy vs. control conditions, other psychotherapies, pharmacotherapies and combined treatment for depression: a comprehensive meta-analysis including 409 trials with 52,702 patients. World Psychiatry. 2023;22(1):105–15.
- Patel V, Saxena S, Lund C, Thornicroft G, Baingana F, Bolton P, et al. The Lancet Commission on global mental health and sustainable development. Lancet. 2018;392(10157):1553–98.
- Vigo DV, Stein DJ, Harris MG, Kazdin AE, Viana MC, Hwang I, et al. Extent and correlates of effective treatment coverage for nine mental and substance use disorders across 21 countries: results from the World Mental Health Surveys. JAMA Psychiatry, In press.
- World Health Organization. Mental Health ATLAS 2020. 2021. https:// www.who.int/publications/i/item/9789240036703. Accessed 10 Sept 2024.
- Scott KM, de Jonge P, Stein DJ, Kessler RC. Mental disorders around the world: facts and figures from the WHO World Mental Health surveys. New York: Cambridge University Press; 2018.

- Vigo D, Haro JM, Hwang I, Aguilar-Gaxiola S, Alonso J, Borges G, et al. Toward measuring effective treatment coverage: critical bottlenecks in quality- and user-adjusted coverage for major depressive disorder. Psychol Med. 2022;52(10):1948–58.
- Alonso J, Liu Z, Evans-Lacko S, Sadikova E, Sampson N, Chatterji S, et al. Treatment gap for anxiety disorders is global: results of the World Mental Health Surveys in 21 countries. Depress Anxiety. 2018;35(3):195–208.
- Degenhardt L, Glantz M, Evans-Lacko S, Sadikova E, Sampson N, Thornicroft G, et al. Estimating treatment coverage for people with substance use disorders: an analysis of data from the World Mental Health Surveys. World Psychiatry. 2017;16(3):299–307.
- Stein DJ, Kazdin AE, Munthali RJ, Hwang I, Harris MG, Alonso J, et al. Determinants of effective treatment coverage for posttraumatic stress disorder: findings from the World Mental Health Surveys. BMC Psychiatry. 2023;23(1):226.
- Thornicroft G, Chatterji S, Evans-Lacko S, Gruber M, Sampson N, Aguilar-Gaxiola S, et al. Undertreatment of people with major depressive disorder in 21 countries. Br J Psychiatry. 2017;210(2):119–24.
- Harris MG, Kazdin AE, Hwang I, Manoukian SM, Sampson NA, Stein DJ et al. Pathway to effective treatment for mental disorders in the World Mental Health Surveys. Part I: perceived need for treatment. Int J Ment Health Syst. Under review.
- 18. Stein DJ, Vigo DV, Harris MG, Kazdin AE, Viana MC, Hwang I et al. Patterns and predictors of 12-month treatment of common anxiety, mood, and substance use disorders in the World Mental Health (WMH) surveys: contact coverage in the context of perceived need. Int J Ment Health Syst. Under review.
- Pozuelo JR, Vigo DV, Kessler RC et al. The WHO World Mental Health Survey collaborators. Predictors and barriers to minimally adequate treatment among treated individuals with mental and substance use disorders: Results from the World Mental Health Survey. Int J Ment Syst. Under review.
- Byrow Y, Pajak R, Specker P, Nickerson A. Perceptions of mental health and perceived barriers to mental health help-seeking amongst refugees: a systematic review. Clin Psychol Rev. 2020;75:101812.
- Goodcase ET, Brewe AM, White SW, Jones S. Providers as stakeholders in addressing implementation barriers to youth mental healthcare. Community Ment Health J. 2022;58(5):967–81.
- 22. Veron L, Sauvade F, Le Barbenchon E. Why do students in psychological distress not use psychological care? Psychol Serv. 2022;19(1):85–94.
- Gliedt JA, Spector AL, Schneider MJ, Williams J, Young S. A description of theoretical models for health service utilization: a scoping review of the literature. Inquiry. 2023;60:469580231176855.
- Mojtabai R, Olfson M, Sampson NA, Jin R, Druss B, Wang PS, et al. Barriers to mental health treatment: results from the National Comorbidity Survey Replication. Psychol Med. 2011;41(8):1751–61.
- Walker ER, Cummings JR, Hockenberry JM, Druss BG. Insurance status, use of mental health services, and unmet need for mental health care in the United States. Psychiatr Serv. 2015;66(6):578–84.
- American Association for Public Opinion Research. Standard Definitions: final dispositions of case codes and outcome rates for surveys. 2016. https://www.aapor.org/AAPOR\_Main/media/publications/Standard-Definitions20169theditionfinal.pdf. Accessed 23 Apr 2024.
- Kessler RC, Ustün TB. The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). Int J Methods Psychiatr Res. 2004;13(2):93–121.
- Harkness J, Pennell B, Villar A, Gebler N, Aguilar-Gaxiola S, Bilgen I. Translation procedures and translation assessment in the World Mental Health Survey Initiative. In: Kessler R, Üstun T, editors. The WHO World Mental Health Surveys: global perspectives on the epidemiology of mental disorders. New York: Cambridge University Press; 2008. p. 91–113.
- Pennell B, Mneimneh Z, Bowers A, Chardoul S, Wells J, Viana M, et al. Implementation of the World Mental Health Surveys. In: Kessler R, Üstun T, editors., et al., The WHO World Mental Health Surveys: global perspectives on the epidemiology of mental disorders. New York: Cambridge University Press; 2008. p. 33–57.
- Ghimire DJ, Chardoul S, Kessler RC, Axinn WG, Adhikari BP. Modifying and validating the Composite International Diagnostic Interview (CIDI) for use in Nepal. Int J Methods Psychiatr Res. 2013;22(1):71–81.

- Lu J, Huang YQ, Liu ZR, Cao XL. Validity of Chinese version of the Composite International Diagnostic Interview-3.0 in psychiatric settings. Chin Med J. 2015;128(18):2462–6.
- 32. Haro JM, Arbabzadeh-Bouchez S, Brugha TS, de Girolamo G, Guyer ME, Jin R, et al. Concordance of the Composite International Diagnostic Interview Version 3.0 (CIDI 3.0) with standardized clinical assessments in the WHO World Mental Health Surveys. In: Kessler R, Üstün T, editors., et al., The WHO World Mental Health Surveys: global perspectives on the epidemiology of mental disorders. New York: Cambridge University Press; 2008. p. 114–27.
- Haro JM, Arbabzadeh-Bouchez S, Brugha TS, de Girolamo G, Guyer ME, Jin R, et al. Concordance of the Composite International Diagnostic Interview Version 3.0 (CIDI 3.0) with standardized clinical assessments in the WHO World Mental Health surveys. Int J Methods Psychiatr Res. 2006;15(4):167–80.
- 34. Montoya Gonzalez LE, Restrepo Bernal DP, Mejía-Montoya R, Bareño-Silva J, Sierra-Hincapié G, de Galvis YT, et al. Sensitivity and specificity between the Composite International Diagnostic Interview Version 3.0 (World Mental Health, CIDI) and the Standardised Clinical Evaluation version I (SCID-I) in a mental health survey of the city of Medellin, 2012. Rev Colomb Psiquiatr. 2016;45(1):22–7.
- Kessler RC, Al-Desouki M, King AJ, Sampson NA, Al-Subaie AS, Al-Habeeb A, et al. Clinical reappraisal of the Composite International Diagnostic Interview Version 3.0 in the Saudi National Mental Health Survey. Int J Methods Psychiatr Res. 2020;29(3):e1828.
- Kessler RC, Abelson J, Demler O, Escobar JI, Gibbon M, Guyer ME, et al. Clinical calibration of DSM-IV diagnoses in the World Mental Health (WMH) version of the World Health Organization (WHO) Composite International Diagnostic Interview (WMHCIDI). Int J Methods Psychiatr Res. 2006;13(2):122–39.
- First MB, Spitzer RL, Gibbon M, Williams JB. Structured clinical interview for DSM-IV axis I disorders: research version, Non-Patient edition (SCID-I/ NP). New York: Biometrics Research, New York State Psychiatric Institute; 2002.
- Merikangas KR, Jin R, He JP, Kessler RC, Lee S, Sampson NA, et al. Prevalence and correlates of bipolar spectrum disorder in the world mental health survey initiative. Arch Gen Psychiatry. 2011;68(3):241–51.
- Andrade LH, Alonso J, Mneimneh Z, Wells JE, Al-Hamzawi A, Borges G, et al. Barriers to mental health treatment: results from the WHO World Mental Health surveys. Psychol Med. 2014;44(6):1303–17.
- 40. Ebert DD, Mortier P, Kaehlke F, Bruffaerts R, Baumeister H, Auerbach RP, et al. Barriers of mental health treatment utilization among first-year college students: first cross-national results from the WHO World Mental Health International College Student Initiative. Int J Methods Psychiatr Res. 2019;28(2):e1782.
- Orozco R, Vigo D, Benjet C, Borges G, Aguilar-Gaxiola S, Andrade LH, et al. Barriers to treatment for mental disorders in six countries of the Americas: a regional report from the World Mental Health Surveys. J Affect Disord. 2022;303:273–85.
- 42. Evans-Lacko S, Aguilar-Gaxiola S, Al-Hamzawi A, Alonso J, Benjet C, Bruffaerts R, et al. Socio-economic variations in the mental health treatment gap for people with anxiety, mood, and substance use disorders: results from the WHO World Mental Health (WMH) surveys. Psychol Med. 2018;48(9):1560–71.
- SAS Institute Inc. SAS<sup>®</sup>Software 94 [computer program]. Cary: SAS Institute Inc; 2013.
- Tabatabai MA, Li H, Eby WM, Kengwoung-Keumo JJ, Manne U, Bae S, et al. Robust logistic and probit methods for binary and multinomial regression. J Biom Biostat. 2014;5(4):1000202.
- 45. Reis AC, Saheb R, Moyo T, Smith C, Sperandei S. The impact of mental health literacy training programs on the mental health literacy of university students: a systematic review. Prev Sci. 2022;23(4):648–62.
- Tay JL, Tay YF, Klainin-Yobas P. Effectiveness of information and communication technologies interventions to increase mental health literacy: a systematic review. Early Interv Psychiatry. 2018;12(6):1024–37.
- Bantjes J, Kessler MJ, Hunt X, Stein DJ, Kessler RC. Treatment rates and barriers to mental health service utilisation among university students in South Africa. Int J Ment Health Syst. 2023;17(1):38.
- Bruwer B, Sorsdahl K, Harrison J, Stein DJ, Williams D, Seedat S. Barriers to mental health care and predictors of treatment dropout in the South African Stress and Health Study. Psychiatr Serv. 2011;62(7):774–81.

- 49. Ebert DD, Franke M, Kählke F, Küchler AM, Bruffaerts R, Mortier P, et al. Increasing intentions to use mental health services among university students. Results of a pilot randomized controlled trial within the World Health Organization's World Mental Health International College Student Initiative. Int J Methods Psychiatr Res. 2019;28(2):e1754.
- van Beljouw I, Verhaak P, Prins M, Cuijpers P, Penninx B, Bensing J. Reasons and determinants for not receiving treatment for common mental disorders. Psychiatr Serv. 2010;61(3):250–7.
- Arundell LL, Greenwood H, Baldwin H, Kotas E, Smith S, Trojanowska K, et al. Advancing mental health equality: a mapping review of interventions, economic evaluations and barriers and facilitators. Syst Rev. 2020;9(1):115.
- Breslau J, Han B, Lai J, Yu H. Impact of the affordable care act medicaid expansion on utilization of mental health care. Med Care. 2020;58(9):757–62.
- 53. Ortega A. Medicaid expansion and mental health treatment: evidence from the Affordable Care Act. Health Econ. 2023;32(4):755–806.
- Hamersma S, Ye J. The effect of public health insurance expansions on the mental and behavioral health of girls and boys. Soc Sci Med. 2021;280:113998.

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