

Perceived helpfulness of treatment for alcohol use disorders: Findings from the World Mental Health Surveys

Louisa Degenhardt¹, Chrianna Bharat¹, Wai Tat Chiu², Meredith G. Harris^{4,5}, Alan E. Kazdin³, Daniel V. Vigo^{6,7}, Nancy A. Sampson², Jordi Alonso^{8,9,10}, Laura Helena Andrade¹¹, Ronny Bruffaerts¹², Brendan Bunting¹³, Graça Cardoso¹⁴, Giovanni de Girolamo¹⁵, Silvia Florescu¹⁶, Oye Gureje¹⁷, Josep Maria Haro¹⁸, Chiyi Hu¹⁹, Aimee N. Karam²⁰, Elie G. Karam^{20,21,22}, Viviane Kovess-Masfety²³, Sing Lee²⁴, Victor Mankuola¹⁷, John J. McGrath^{5,25,26}, Maria Elena Medina-Mora²⁷, Jacek Moskalewicz²⁸, Fernando Navarro-Mateu^{29,30,31}, José Posada-Villa³², Charlene Rapsey³³, Juan Carlos Stagnaro³⁴, Hisateru Tachimori³⁵, Margreet ten Have³⁶, Yolanda Torres³⁷, David R. Williams³⁸, Zahari Zarkov³⁹, Ronald C. Kessler², and on behalf of the WHO World Mental Health Survey collaborators*.

1. National Drug and Alcohol Research Centre, University of New South Wales, Sydney, NSW 2052, Australia
2. Department of Health Care Policy, Harvard Medical School, 180 Longwood Avenue, Boston, MA 02115, USA
3. Department of Psychology, Yale University, 2 Hillhouse Avenue- 208205, New Haven, CT 06520, USA
4. School of Public Health, The University of Queensland, c/o QCMHR, Locked Bag 500, Archerfield, QLD 4108, Australia
5. Queensland Centre for Mental Health Research, The Park Centre for Mental Health, Wolston Park Rd, Wacol QLD 4076, Australia
6. Department of Psychiatry, University of British Columbia, UBC Hospital – Detwiller Pavilion, Room 2813, 2255 Wesbrook Mall, UBC Vancouver Campus, Vancouver BC, V6T 2A1, Canada
7. Department of Global Health and Social Medicine, Harvard Medical School, 641 Huntington Avenue, Boston, MA 02115, USA
8. IMIM-Hospital del Mar Medical Research Institute, PRBB Building, Doctor Aiguader, 88, Barcelona 08003, Spain
9. CIBER en Epidemiología y Salud Pública (CIBERESP), Av. Monforte de Lemos, 3-5, Pabellón 11, Planta 0 28029 Madrid, Spain
10. Pompeu Fabra University (UPF), Plaça de la Mercè, 10-12, 08002 Barcelona, Spain
11. University of São Paulo Medical School, Núcleo de Epidemiologia Psiquiátrica - LIM 23, Rua Dr. Ovidio Pires de Campos, 785, São Paulo, CEP 05403-010, Brazil
12. Universitair Psychiatrisch Centrum - Katholieke Universiteit Leuven (UPC-KUL), Campus Gasthuisberg, Herestraat 49, B-3000 Leuven, Belgium
13. School of Psychology, Ulster University, Londonderry, College Avenue, Londonderry BT48 7JL, United Kingdom

14. Lisbon Institute of Global Mental Health and Chronic Diseases Research Center (CEDOC), NOVA Medical School | Faculdade de Ciências Médicas, Universidade Nova de Lisboa, Campo Mártires da Pátria, 130, 1169-056 Lisbon, Portugal
15. IRCCS Istituto Centro San Giovanni di Dio Fatebenefratelli, Via Pilastroni 4, Brescia, Italy
16. National School of Public Health, Management and Development, 31 Vaselor Str., 21253 Bucharest, Romania
17. Department of Psychiatry, University College Hospital, Ibadan, PMB 5116, Nigeria
18. Parc Sanitari Sant Joan de Déu, CIBERSAM, Universitat de Barcelona Dr. Antoni Pujades, 42, Sant Boi de Llobregat, Barcelona 08830, Spain
19. Shenzhen Institute of Mental Health & Shenzhen Kangning Hospital, 1080 Cuizhu Rd, Luohu District, Shenzhen, Guangdong Province, China, 518020
20. Institute for Development, Research, Advocacy and Applied Care (IDRAAC), Achrafieh, St. George Hospital Street, Beirut, Lebanon
21. Department of Psychiatry and Clinical Psychology, St George Hospital University Medical Center, Beirut, Ashrafieh 166378, Lebanon
22. Balamand University, Faculty of Medicine, Rond Point Saloumeh, Sin el Fil, Beirut, Lebanon
23. Ecole des Hautes Etudes en Santé Publique (EHESP), EA 4057, Paris Descartes University, 20 Avenue George Sand La Plaine, 93210 St Denis, France
24. Department of Psychiatry, Chinese University of Hong Kong, Tai Po, Hong Kong, G/F Multicentre, Tai Po Hospital, Tai Po, Hong Kong
25. Queensland Brain Institute, The University of Queensland, QBI Building 79, St Lucia QLD 4072, Australia
26. National Centre for Register-based Research, Aarhus University, Fuglesangs Allé 26, Bygning R2640-R2641, DK-8210 Aarhus V, Denmark
27. National Institute of Psychiatry Ramón de la Fuente Muñiz, Calzada México-Xochimilco, 101, Colonia San Lorenzo Huipulco, México City DF 14370, Mexico
28. Institute of Psychiatry and Neurology, Jana III Sobieskiego 9, 02-957 Warsaw, Poland
29. Unidad de Docencia, Investigación y Formación en Salud Mental, Servicio Murciano de
30. Salud, Murcia Health Service, C/ Lorca, nº 58. -El Palmar, Murcia 30120, Spain
31. Instituto Murciano de Investigación Biosanitaria Virgen de la Arrixaca, 30120 El Palmar, Murcia, Spain
32. Centro de Investigación Biomédica en ERed en Epidemiología y Salud Pública, 30120 El Palmar, Murcia, Spain
33. Colegio Mayor de Cundinamarca University, Faculty of Social Sciences, Calle 28 # 5B 02, Bogotá, 11001000, Colombia
34. Department of Psychological Medicine, University of Otago, PO Box 56, Dunedin 9054, New Zealand
35. Departamento de Psiquiatría y Salud Mental, Facultad de Medicina, Universidad de Buenos Aires, Paraguay 2155, C1121ABG CABA, Argentina

36. National Institute of Mental Health, National Center for Neurology and Psychiatry, 4 Chome-1-1 Ogawahigashicho, Kodaira, Tokyo 187-8551, Japan
37. Trimbos-Instituut, Netherlands Institute of Mental Health and Addiction, Da Costakade 45, 3521 VS Utrecht, Postbus 725, 3500 AS Utrecht, The Netherlands
38. Center for Excellence on Research in Mental Health, CES University, Calle 10A No. 22-04, Medellin, Colombia 050021
39. Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, 677 Huntington Ave, Boston, MA 02115
40. Department of Mental Health, National Centre of Public Health and Analyses, Boulevard "Acad. Ivan Geshov" No15, Sofia 1314, Bulgaria.
- 41.

The WHO World Mental Health Survey collaborators are Sergio Aguilar-Gaxiola, MD, PhD; Ali Al-Hamzawi, MD; Mohammed Salih Al-Kaisy, MD; Jordi Alonso, MD, PhD; Yasmin A. Altwajri, PhD; Laura Helena Andrade, MD, PhD; Lukoye Atwoli, MD, PhD; Corina Benjet, PhD; Guilherme Borges, ScD; Evelyn J. Bromet, PhD; Ronny Bruffaerts, PhD; Brendan Bunting, PhD; Jose Miguel Caldas-de-Almeida, MD, PhD; Graça Cardoso, MD, PhD; Somnath Chatterji, MD; Alfredo H. Cia, MD; Louisa Degenhardt, PhD; Koen Demyttenaere, MD, PhD; Silvia Florescu, MD, PhD; Giovanni de Girolamo, MD; Oye Gureje, MD, DSc, FRCPsych; Josep Maria Haro, MD, PhD; Meredith G. Harris, PhD; Hristo Hinkov, MD, PhD; Chi-yi Hu, MD, PhD; Peter de Jonge, PhD; Aimee Nasser Karam, PhD; Elie G. Karam, MD; Georges Karam, MD; Norito Kawakami, MD, DMSc; Ronald C. Kessler, PhD; Andrzej Kiejna, MD, PhD; Viviane Kovess-Masfety, MD, PhD; Sing Lee, MBBS; Jean-Pierre Lepine, MD; John J. McGrath, MD, PhD; Maria Elena Medina-Mora, PhD; Zeina Mneimneh, PhD; Jacek Moskalewicz, PhD; Fernando Navarro-Mateu, MD, PhD; Marina Piazza, MPH, ScD; Jose Posada-Villa, MD; Kate M. Scott, PhD; Tim Slade, PhD; Juan Carlos Stagnaro, MD, PhD; Dan J. Stein, FRCPC, PhD; Margreet ten Have, PhD; Yolanda Torres, MPH, Dra.HC; Maria Carmen Viana, MD, PhD; Daniel V. Vigo, MD, DrPH; Harvey Whiteford, MBBS, PhD; David R. Williams, MPH, PhD; Bogdan Wojtyniak, ScD.

Corresponding author:

Louisa Degenhardt

l.degenhardt@unsw.edu.au

National Drug and Alcohol Research Centre

UNSW Sydney, Sydney, Australia

Abstract

Aim: We examined prevalence and factors associated with receiving perceived helpful AUD treatment, and persistence in help-seeking after earlier unhelpful treatment.

Methods: Data came from 27 community epidemiologic surveys of adults in 24 countries using the World Health Organization World Mental Health surveys (n=93,843). Participants with a lifetime history of treated AUD were asked if they ever received helpful AUD treatment, and how many professionals they had talked to up to and including the first time they received helpful treatment (or how many ever, if they had not received helpful treatment).

Results: 11.8% of respondents with lifetime AUD reported ever obtaining treatment (n=9,378); of these, 44% reported that treatment was helpful. The probability of obtaining helpful treatment from the first professional seen was 21.8%; the *conditional* probability of subsequent professionals being helpful after earlier unhelpful treatment tended to decrease as more professionals were seen. The *cumulative* probability of receiving helpful treatment at least once increased from 21.8% after the first professional to 79.7% after the seventh professional seen, following earlier unhelpful treatment. However, the cumulative probability of persisting with up to seven professionals in the face of prior treatments being unhelpful was only 13.2%.

Conclusion: Fewer than half of people with AUDs who sought treatment found treatment helpful; the most important factor was persistence in seeking further treatment if a previous professional had not helped. Future research should examine how to increase the likelihood that AUD treatment is found to be helpful on any given contact.

Keywords: alcohol use disorder; treatment; epidemiology

1. Introduction

Globally, alcohol use disorders (AUD) were estimated to have occurred in perhaps 100 million people in 2016 (an age-standardised rate of 1,320 per 100,000 people) (Degenhardt et al., 2018); AUDs may affect approximately one in 12 people across their lifetime (Glantz et al., 2020). AUDs are an important contributor to the global burden of disease (Degenhardt et al., 2018).

There are interventions for AUDs for which there is evidence for short-term benefit(Connor, Haber, & Hall, 2016). These include non-pharmacological interventions such as cognitive behaviour therapy and motivational enhancement therapy, and a range of medications including acamprosate(Connor et al., 2016); 12-step programmes (peer-based self-help groups) are also used by people in many countries.

There is increasing recognition of the need for a public health approach to SUDs(Volkow, Poznyak, Saxena, Gerra, & Network, 2017), clearly evident in the United Nations' Sustainable Development Goals (SDGs) for 2030, where prevention and treatment of SUDs features in the targets(United Nations, 2015), particularly *3.5 - Strengthen prevention and treatment of substance use disorders including opioid use and harmful use of alcohol*. Despite this, the estimated level of treatment for AUDs is very low globally (Degenhardt et al., 2017; Mekonen et al., 2020; World Health Organization, 2010a).

The importance of perceived helpfulness in potentially retaining people in treatment is acknowledged in key UN guidelines around treatment for substance use(World Health Organization & United Nations Office on Drugs and Crime, 2020). Studies have found that people who expressed positive feelings about the treatments they received have reduced substance use(Davis et al., 2020; Lee et al., 2007; Zhiwei, Gerstein, & Friedmann, 2008),

reduced psychological distress(Davis et al., 2020), improved quality of life(Müller et al., 2020) and longer treatment retention (Davis et al., 2020; Raney, Magaletta, & Hubbert, 2005). This evidence comes from small cross-sectional or cohort studies of clinical samples in specialist treatment settings, however (Davis et al., 2020), limiting generalisability to people receiving treatment in other settings, and over the longer term. The other concern about these studies is that they focus on a given treatment currently being received, and do not provide information about treatment patterns over the life course, and across multiple potential different treatment settings.

This is important because for many people, treatment is repeatedly sought across different settings over an extended period of time. Over the course of a person's life (during the time when they have an active AUD) it is possible for an individual to seek assistance from varied forms of treatment or different professionals delivering the same treatment. Treatment is not always experienced as helpful, and an individual may be prompted to seek care from another professional in the same or another setting. To examine this trajectory or 'pathway' to helpful treatment (as reported by the individual), it is necessary to consider the sequence of help-seeking from different health professionals following the onset of disorder. Taking this approach, the probability of an individual ever receiving helpful treatment is the product of two aspects: the probability of perceiving a given treatment provider as helpful, and the probability that the individual will persist in seeking help after they receive unhelpful treatment (Hora, Dodd, & Hora, 1993). Both are important and could be affected by different factors (Harris et al., 2020; Nierenberg et al., 2021; Stein et al., 2020; Stein et al., in press).

Population-based surveys have the capacity to generate data from broader populations, yet to date there has been limited data from such studies. To our knowledge, no study has ever

looked at the proportion of people with lifetime substance use disorders who ever receive helpful treatment and the number of iterations required before helpful treatment is found. Using a cross-national, representative community sample of individuals with a lifetime history of AUD treatment, we examined the prevalence and factors associated with receiving helpful AUD treatment, and persistence in help-seeking after initially obtaining unhelpful treatment, as the two main components for a person eventually finding treatment they consider helpful.

2. Material and methods

2.1 Samples

The World Health Organization (WHO) World Mental Health (WMH) surveys are a coordinated set of community epidemiological surveys administered to probability samples of the noninstitutionalised household population in countries throughout the world (Kessler & Üstün, 2004; The World Mental Health Survey Initiative). Data for the current report came from 27 WMH surveys carried out in 24 countries between 2001 and 2017 – 16 surveys in countries classified by the World Bank as high-income countries (Argentina, Australia, Belgium, France, Germany, Israel, Italy, Japan, Murcia – Spain, Netherlands, New Zealand, Northern Ireland, Poland, Portugal, Spain, and United States) and 11 surveys in countries classified as low- and middle-income countries (Colombia, Nigeria, Peru, Sao Paulo – Brazil, Bulgaria (2 surveys), Lebanon, Medellin – Colombia, Mexico, Romania, and South Africa). In Bulgaria, the first national survey was conducted from 2002-2006 and this was followed by a new national survey in 2016-2017. Colombia and Spain each administered both a national survey (in 2001-2002 in Spain and in 2003 in Colombia) and a later regional survey (in Murcia, Spain from 2010-2012 and in Medellín, Colombia from 2011-2012). Eighteen surveys were based on nationally representative samples, whereas three were representative of selected Metropolitan areas (Sao Paulo – Brazil, Medellin – Colombia, and eleven metropolitan areas in Japan), three were representative of selected regions (Nigeria, Peru, and Murcia – Spain), and three were representative of all urbanised areas (Argentina, Colombia, and Mexico). Response rates ranged from 45.9% (France) to 97.2% (Medellin, Colombia) and averaged 68% across surveys (see Table 1).

The interview schedule was developed in English and translated into other languages using a standardised WHO translation, back-translation, and harmonisation 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. Interviews were administered in two parts. Part I was administered to all 131,309 respondents and assessed core Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) mental disorders. Part II assessed additional disorders and correlates and was administered to all respondents who met lifetime criteria for any Part I disorder and to a probability subsample of other Part I respondents (n=72,241 respondents).

2.2 Measures

2.2.1 Alcohol use disorder

Diagnoses were based on Version 3.0 of the WHO's Composite International Diagnostic Interview (CIDI) (Kessler & Üstün, 2004), a fully structured lay-administered diagnostic interview. The DSM-IV criteria were used to define alcohol abuse and alcohol dependence. Lifetime AUD was defined as having a history of either alcohol abuse or alcohol dependence (Degenhardt et al., 2019; Grant et al., 2017). Clinical reappraisal interviews were carried out in several countries in conjunction with WMH surveys using the lifetime nonpatient version of the Structured Clinical Interview for DSM-IV (First, Spitzer, Gibbon, & Williams, 2002) as the criterion standard. Moderate to substantial agreement was found between diagnoses of alcohol abuse and alcohol dependence based on the CIDI and those based on blinded Structured Clinical Interview clinician-administered reappraisal interviews (Haro et al., 2006). In the following early WMH surveys (Colombia, Nigeria, Peru, Bulgaria (2002-6), Lebanon, Mexico, South Africa, Japan, Israel, New Zealand, and United States), respondents who did

not endorse any of the four alcohol abuse criteria were not asked questions related to alcohol dependence. Alcohol dependence data was imputed for these countries using data from more recently completed surveys without the skip pattern(Lago et al., 2017).

2.2.2 Perceived helpfulness of treatment

Respondents who met lifetime DSM-IV criteria for AUD were asked about age at onset and were then asked: “Did you ever in your life talk to a medical doctor or other professional about your use of (alcohol/drugs/alcohol or drugs)?”. If respondents answered yes, they were asked “How old were you the first time you talked to a professional about your use of (alcohol/drugs/alcohol or drugs)?”. “Other professionals” were defined broadly to include psychologists, counsellors, spiritual advisors, herbalists, acupuncturists, and other healing professionals. Respondents were then asked whether they ever got treatment for their AUD that they considered “helpful or effective”. If they responded yes, they were asked “How many professionals did you ever talk to about your use of (alcohol/drugs/alcohol or drugs), up to and including the first time you got helpful treatment?”; if they responded no, they were asked “How many professionals did you ever talk to about your use of (alcohol/drugs/alcohol or drugs)?”. Respondents were asked whether they ever got a prescription or medicine for their mental health. If they responded yes, they were asked “How old were you the first time (you were given this sort of prescription or medicine)?”. Data on the helpfulness of specific types of treatment providers and prescriptions or medications received were not collected.

Respondents with lifetime AUD and who also met lifetime DSM-IV criteria for drug use disorder answered the above questions in relation to both their alcohol and drug use. To evaluate the prevalence of and factors associated with AUD treatment only, sensitivity

analyses were conducted among the subset of respondents that had an alcohol use disorder and no drug use disorder.

Only respondents who reported receiving treatment for their AUD 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 analysed based on regression-based imputations of the missing items that took into account scores on the reported items as well as other individual reported characteristics (see **Appendix Table 1**).

2.2.3 Factors associated with perceived helpfulness

Socioeconomic characteristics included age at first AUD treatment (continuous), sex, marital status (never married, married, or previously married at the time of first AUD treatment, and education level (in quartiles defined by within-country distributions) at the time of first treatment. Lifetime comorbid conditions included number of anxiety disorders, mood, and substance use disorders with first onsets before the age the respondent first sought treatment. Anxiety disorders included generalized anxiety disorder, panic disorder, agoraphobia with or without panic disorder, posttraumatic stress disorder, specific phobia, and social phobia. Substance use disorders included alcohol and drug abuse and dependence.

Childhood adversities (CAs) occurring before age 18 years were assessed retrospectively and included CAs related to family dysfunction (physical abuse, sexual abuse, neglect, parent mental disorder, parent substance use disorder, parent criminal behaviour and family violence), and well as others (parent died, parent divorced, other parent loss, physical illness, and economic adversity).

Treatment type was defined as the cross-classification of variables for (a) whether the respondent reported receiving medication, talk therapy, or both, as of the age of first AUD treatment; and; (b) types of treatment providers seen as of that age, including mental health specialists (psychiatrist, psychiatric nurse, psychologist, psychiatric social worker, mental health counsellor) with or without pharmacotherapy, primary care providers, human services providers (social worker or counsellor 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 AUD and age of initially seeking treatment. The year 2000 corresponds to the midpoint when treatment was first received by people in the analysis sample.

2.3 Analysis methods

To investigate the two components of helpful treatment separately, we used discrete-time survival analysis to calculate the conditional and cumulative probabilities of (1) obtaining helpful treatment after seeing between one and seven professionals and (2) persisting in seeking treatment with between two and seven professionals after obtaining prior unhelpful treatment. We followed up with clients through to seven professionals because this was the last number where at least 30 clients received treatment. We then carried out parallel survival analyses of the factors associated with these two component outcomes using standard discrete-time methods and a logistic link function, followed by a person-level model of overall probability of ever receiving helpful treatment regardless of the number of professionals seen.

For purposes of pooled estimates, we combined surveys based on sample sizes rather than the sizes of the populations of the countries analysed. Pooled prevalence estimates therefore represent the weighted mean across our surveys, where weights are based on survey sample size. We also controlled for dummy control variables for survey in all models so that coefficients for other predictors could be interpreted as pooled within-survey coefficients. This approach implicitly assumes that slopes are constant across countries and allows for multiple national, regional, and mix of national and regional surveys in each country.

Individual weights were applied to adjust for probability of selection, nonresponse, and poststratification. In addition, data from part 2 respondents were weighted to adjust for differential probabilities of selection into part 2 and deviations between the sample population demographic-geographic distributions. Because the WMH sample designs used weighting and clustering, all statistical analyses were carried out using the Taylor series linearisation method (Wolter, 1985), a design-based method implemented in SAS 9.4 program (SAS Institute Inc, 2020). Logistic regression coefficients and ± 2 of their design-based standard errors (SEs) were exponentiated to create odds ratios (ORs) and 95% confidence intervals (CIs). The significance of the sets of coefficients was evaluated with Wald χ^2 tests based on design-corrected coefficient variance-covariance matrices. Statistical significance was evaluated using 2-sided design based .05 probability level tests. We followed the Strengthening the Reporting of Observational Studies in Epidemiology (Von Elm et al., 2007) (see **Appendix**).

3. Results

3.1 Perceived helpfulness of treatment

Lifetime prevalence (SE) of AUD was 11.5% (0.2%) in high-income countries, 6.7% (0.2%) in low- and middle-income countries, and 9.5% (0.1%) in the total sample. Across all countries combined, 11.8% of respondents with lifetime AUD reported ever obtaining treatment; in high-income countries (14.2% [0.7%]) this was more than twice that of low/middle income countries (6.4% [0.8%]).

Of those treated, 44.5% (2.3%) reported ever obtaining treatment that they considered helpful, with the proportions similar in high and low/middle income countries (44.0% [2.5%] and 46.8% [5.3%], respectively). Thus, only around one in twenty people with a lifetime AUD received treatment they perceived to be helpful (5.3% [0.3%]), with higher rates among those in high- than in low/middle income countries (6.2% [0.4%] and 3.0% [0.4%], respectively).

Figure 1 around here

3.2 Helpful alcohol use disorder treatment by number of professionals seen

Across all countries, the probability of obtaining helpful AUD treatment from the first professional seen was 21.8% (2.0%). The conditional probability of a second professional being helpful after initial unhelpful treatment was 21.5% (1.8%). Conditional probabilities of subsequent professionals being helpful if they were seen after earlier unhelpful treatment were in the range of 7.8% (1.6%) after the seventh professional to 36.5% (5.6%) after the fifth professional.

Survival analysis based on these conditional probabilities suggested that the cumulative probability of receiving helpful treatment from at least one treatment provider would increase from 21.8% (2.0%) after the first professional was seen to 38.6% (2.5%) when treatment clients persevered in trying a second professional after unhelpful treatment from the first. The cumulative probability would increase to an estimated 79.7% (3.2%) if all treatment clients persevered in trying up to seven professionals after earlier ones were unhelpful. Patterns and probabilities were generally similar across country income levels.

Table 2 around here

3.3 Persistence with alcohol use disorder help-seeking following treatment failure

Among treatment clients who were not helped by the first professional seen, 61.5% (1.6%) persisted in seeing a second professional. Further persistence after unhelpful treatments from between the third and seventh professionals ranged from 64.0% (3.2%) to 94.2% (1.1%). However, because not all people persisted after each unhelpful treatment, the cumulative probability of persisting with up to seven professionals in the face of prior treatments being unhelpful was 13.2% (2.3%). Patterns were generally similar across country income levels.

Table 3 around here

3.4 Factors associated with helpful alcohol use disorder treatment

Logistic regression results of three multivariate models assessing whether treatment was helpful pooled across all professional seen by each person (model 1), whether people persisted in help-seeking after previous unhelpful treatment pooled across subsequent professionals seen after an earlier unhelpful professional (model 2), and whether helpful

treatment was obtained at the person level regardless of number of treatment professionals seen (model 3) are shown in Table 4.

Adjusting for all other variables in the model, the relative odds of treatment being perceived as helpful at the person level were lower among people who were female (OR 0.68; 95%CI, 0.49-0.94) and a student (OR 0.41; 95%CI, 0.20-0.82 vs a person who had obtained a high education level) at the time of treatment. Decomposition into the two components of helpful treatment showed that gender was associated with significantly reduced relative odds of treatment from a given professional being helpful (OR 0.75; 95%CI, 0.57-0.97) rather than an association with persistence after unhelpful treatment (OR 0.78; 95%CI 0.60-1.01).

Treatment provided by general medical, complementary or alternative medicine, or a mental health specialist combined with psychotherapy were associated with increased relative odds of treatment being perceived as helpful at the person level (treatment type: general medical OR 1.62; 95%CI 1.08-2.43; complementary or alternative medicine OR 1.58, 95%CI 1.10-2.28; mental health specialist combined with psychotherapy OR 2.62; 95%CI 1.63-4.21 vs human services). Decomposition showed that the associations for treatment provided by general medical or complementary or alternative medicine were due to increased persistence after unhelpful treatment rather than to these factors showing increased odds of treatment from a given professional being perceived as helpful. Treatment provided by a mental health specialist combined with medication was positively associated with persistence but negatively associated with helpful treatment from a given professional, resulting in no significant association at the person level.

Both alcohol dependence and drug abuse were associated with increased relative odds of treatment being perceived as helpful at the person level (substance disorder: alcohol

dependence OR 1.64, 95%CI 1.19-2.27; drug abuse OR 2.10, 95%CI 1.44-3.07). These associations were due to increased persistence after unhelpful treatment rather than to a given professional being perceived as helpful. Other childhood adversities were positively associated with persistence (OR 1.53, 95%CI 1.13-2.08) but were not associated with treatment from a given professional or treatment being perceived as helpful.

Table 4 around here

Additional analyses were conducted to determine whether significant predictors varied in importance, either by country income group or historical time. A stronger association was observed between treatment provided by a mental health specialist and increased odds of perceived helpfulness of treatment at the person level in low/middle income countries compared to high income countries. With respect to time trends, low-average or high-average education levels were associated with increased odds of perceived helpfulness of treatment at the person level for treatment received in 2000 or later but not before (see **Appendix Tables 3-4**). Sensitivity analyses were conducted to investigate the impact of restricting the sample to those with AUD and no drug use disorder, the results of which are shown in **Appendix Tables 5-8**. Findings were largely consistent between analyses conducted with the AUD only subsample and those presented in this study.

4. Discussion

We used data from the World Mental Health Survey to examine treatment seeking and receipt of helpful treatment among people with a lifetime history of AUD. Only one in eight people with a lifetime AUD (11.8%) had sought treatment at some point, confirming the earlier documented finding (Degenhardt et al., 2017; World Health Organization, 2010a) of very low treatment coverage for SUDs globally (World Health Organization, 2010a). This level of overall treatment coverage is far lower than it is for other mental disorders (Harris et al., 2020; Nierenberg et al., 2021; Stein et al., 2020; Stein et al., in press): between one in three to one in four people with other mental disorders had sought some treatment lifetime (37.2% of people with lifetime major depressive disorder (Harris et al., 2020); 23.5% of those with lifetime PTSD (Stein et al., 2020), 26.6% of those with lifetime bipolar disorder (Nierenberg et al., 2021) and 34.% of those with lifetime generalised anxiety disorder (Stein et al., in press)). There is clearly a major concern around the low accessibility of AUD treatment in both high and low income countries, which we have discussed previously (Degenhardt et al., 2017). In many contexts, significant investment in service systems and capacity building will need to occur where little to no formal treatment services or systems exist.

Just under half of those with AUD who sought treatment (44.5%) ever obtained treatment they considered helpful (5.3% of all those with a lifetime AUD). Again, this level of perceived helpfulness was far lower for AUDs than for other disorders, where around two thirds of those who sought treatment found that it had been helpful to them (Harris et al., 2020; Nierenberg et al., 2021; Stein et al., 2020). There is clearly not only a large difference in

treatment accessibility, but also in the perceived helpfulness, between AUDs and other mental disorders; both of these issues require concerted attention and investment.

The reasons for these differences are likely manifold. In comparison to treatment for mental disorders, treatment for substance use disorders is often far less well resourced. There are also sizeable issues around stigma and accessibility of treatment for substance use disorders that are likely far greater than those for mental disorders. Furthermore, effective treatments for AUDs are far less well-developed than for mental disorders, meaning that even when help is sought, it is likely that people will not find it helpful because in many instances ineffective treatments are largely what are available.

Persisting in seeking treatment despite having received unhelpful treatment was important in increasing the likelihood of receiving helpful treatment: among those who sought help from up to seven health professionals, 79.7% would receive helpful treatment. However, only 13.2% of those ever seeking treatment persisted in seeing up to seven professionals.

The fact that fewer than half of treatment seekers felt that they had ever received helpful treatment, with generally only around one in five reporting that treatment was helpful on any given contact (conditional on previous ones not being helpful), suggests that there is significant room for improving clients' perceptions of how helpful treatment for AUDs is. The fact that existing research suggest that having perceived treatment as helpful is related to positive SUD treatment outcomes further underscores the importance of understanding the reasons for and improving the levels of satisfaction among people receiving treatment for their substance use.

People with AUD in low and middle-income countries were only half as likely to obtain helpful AUD treatment as those in high-income countries (3.0% versus 6.2%). This was driven by the difference in rates of people entering AUD treatment in the first place - among those who received treatment, there were no differences in probabilities of obtaining helpful treatment from each professional seen, nor of persisting in seeking treatment if a treatment attempt was not found to be helpful. There is clearly potential to vastly improve the perceived helpfulness of the AUD treatment that is received across countries. Quality improvement initiatives, such as adoption of the evidence-based WHO mhGAP Intervention Guide (Barbui et al., 2010; Dua et al., 2011; World Health Organization, 2010b) and the work of UNODC and WHO in improving treatment quality in low and middle income countries (Saenz, Busse, Tomas, & Clark, 2015; Tomás-Rosselló et al., 2010) could be helpful in this regard.

Of importance here was that, for most factors associated with receiving helpful treatment at the person-level, the associations were driven by persistence in seeking help despite previously unhelpful treatment rather than the perceived helpfulness of any specific treatment encounter. This suggests that people who are more motivated to address their AUD are also more persistent in seeking help.

Strategies to improve persistence despite finding previous treatment unhelpful are therefore very important to develop. There is increasing attention being given not only to the importance of client perceptions of the treatment they receive, but in having a wider array of choice in, and the ability to choose one's own treatment (e.g. (Gutierrez, Dubov, Altice, & Vlahov, 2021)). To the extent that more treatment options are available for people with substance use disorders, this may encourage persistence with seeking treatment in people who have not found prior options they experienced helpful.

We found lower probabilities of helpful treatment among women. Issues related to the suitability, acceptability and accessibility of treatment for women with substance use problems have long been acknowledged. A range of systematic, structural, social and personal barriers to women receiving effective treatment for substance use disorders have been identified (Roberts, Mathers, Degenhardt, & on behalf of the Reference Group to the United Nations on HIV and injecting drug use, 2010; United Nations Office on Drugs and Crime, 2004). Of note was that it did seem that there was no lowered likelihood of women persisting despite previously unhelpful being received, but rather that treatments were less likely to be perceived as helpful. Gender differences in other experiences of treatment for AUDs, for example satisfaction, could explain this. For women who are successful in entering treatment, it is important to ensure that treatment providers deliver services in a gender friendly manner that considers the needs for flexibility, reduces the experience of discrimination and stigma, facilitates access to other important health and social interventions including women's sexual and reproductive needs, and address issues such as risks of violence and intimate partner violence. These have the capacity to improve the experience of AUD treatment and potentially increase the experience of treatment being considered helpful (Roberts et al., 2010; United Nations Office on Drugs and Crime, 2004).

People with a history of childhood adversity – which parental loss and childhood illness - were also more likely to persist with seeking treatment. Particularly in the case of experiencing childhood illness, such individuals might be more motivated to address substance use problems because of prior experience of illness, and/or concerns about ongoing illness and the potential for substance use to impact on one's physical health (and potentially to avoid causing loss to others in one's family).

We also found higher relative odds of receiving helpful treatment in people who received AUD treatment from mental health specialists, general practitioners and those in complementary medicine. This was due to their persistence in seeking further treatment despite the experience of an unhelpful treatment episode. This could suggest that people seeking help from these groups may have more serious substance use problems than those in human services (e.g., social workers). Consistent with this possibility, people with comorbid mental disorders were no less likely to have perceived their treatment to have been helpful, a finding consistent with previous research (Blonigen, Bui, Harris, Hepner, & Kivlahan, 2014). It is possible that the treatment received by people with comorbid mental disorders is qualitatively different – both in the type of treatment and in the intensity of the treatment. Nonetheless, this is suggestive observational evidence supporting the argument against excluding patients with such comorbidities from treatment.

4.1 Limitations

There are limitations of this study. We did not have data to corroborate participants' recall of lifetime AUD symptoms and the timing of treatment. To improve reporting accuracy, the WMHS surveys do include questions designed to aid memory and limit recall uncertainty; we also restricted the sample to those initiating AUD treatment since 1990. Nonetheless, it remains possible that people misremembered AUD symptoms and/or the timing of treatment, which may have affected the results we obtained.

Perceived treatment helpfulness was assessed with a question asking whether and when participants “talk(ed) to” a professional about their AU, with follow-up questions about whether they ever received “helpful or effective” treatment, and of the number of professionals seen up to the point where helpful treatment was first received. It is not

possible to know whether the professionals were seen in a formal consultation, the clinical content of the treatments, nor the manner in which people determined whether treatment received was helpful. Despite these limitations, the data presented in this manuscript suggest there is considerable scope for reducing the extent to which people must progress through multiple steps and modes of treatment in order to find it helpful to them.

Clients could not be randomly assigned to groups defined by persistence in help-seeking. Therefore, we do not know whether people who did not persist would have reported similar levels of perceived helpfulness of treatment if they had all persisted.

Just fewer than half of the small proportion of people who ever receive treatment for AUDs find this treatment to be helpful to them. There is substantial opportunity to improve the perceived quality and effectiveness of SUD treatment for this group, alongside efforts to dramatically scale up treatment across the globe.

4.2 Conclusions

The perceived helpfulness of treatment is important when considering client-centred perspectives in treatment, and research has shown it is significantly related to improved treatment outcomes. Fewer than half of the small proportion of people with AUDs who seek treatment find treatment helpful, with the most important factor being persistence in attending further treatment episodes if a previous one had not been helpful. It is important that future research sheds light on ways in which to increase the likelihood that AUD treatment is found to be helpful on any given contact, rather than requiring persistence through multiple attempts on the client's behalf; improving our capacity to provide successful, tailored approaches to AUD treatment would be of significant benefit.

5. References

- Barbui, C., Dua, T., Van, O. M., Yasamy, M. T., Fleischmann, A., Clark, N., . . . Saxena, S. (2010). Challenges in developing evidence-based recommendations using the GRADE approach: the case of mental, neurological, and substance use disorders. *PLoS.Med.*, 7(8).
- Blonigen, D. M., Bui, L., Harris, A. H., Hepner, K. A., & Kivlahan, D. R. (2014). Perceptions of behavioral health care among veterans with substance use disorders: results from a national evaluation of mental health services in the Veterans Health Administration. *J Subst Abuse Treat*, 47(2), 122-129. doi:10.1016/j.jsat.2014.03.005
- Connor, J. P., Haber, P. S., & Hall, W. D. (2016). Alcohol use disorders. *Lancet*, 387(10022), 988-998. doi:10.1016/s0140-6736(15)00122-1
- Davis, E. L., Kelly, P. J., Deane, F. P., Baker, A. L., Buckingham, M., Degan, T., & Adams, S. (2020). The relationship between patient-centered care and outcomes in specialist drug and alcohol treatment: A systematic literature review. *Subst Abus*, 41(2), 216-231. doi:10.1080/08897077.2019.1671940
- Degenhardt, L., Bharat, C., Glantz, M. D., Sampson, N. A., Al-Hamzawi, A., Alonso, J., . . . Kessler, R. C. (2019). Association of Cohort and Individual Substance Use With Risk of Transitioning to Drug Use, Drug Use Disorder, and Remission From Disorder: Findings From the World Mental Health Surveys. *JAMA Psychiatry*, 76(7), 708-720. doi:10.1001/jamapsychiatry.2019.0163
- Degenhardt, L., Charlson, F., Ferrari, A., Santomauro, D., Erskine, H., Mantilla-Herrera, A., . . . Vos, T. (2018). The global burden of disease attributable to alcohol and drug use in 195 countries and territories, 1990-2016: a systematic analysis for the Global Burden

of Disease Study 2016. *Lancet Psychiatry*, 5(12), 987-1012. doi:10.1016/s2215-0366(18)30337-7

Degenhardt, L., Glantz, M., Evans-Lacko, S., Sadikova, E., Sampson, N., Thornicroft, G., . . .

Kessler, R. C. (2017). Estimating treatment coverage for people with substance use disorders: an analysis of data from the World Mental Health Surveys. *World Psychiatry*, 16(3), 299-307. doi:10.1002/wps.20457

Dua, T., Barbui, C., Clark, N., Fleischmann, A., Poznyak, V., van Ommeren, M., . . . Saxena, S.

(2011). Evidence-based guidelines for mental, neurological, and substance use disorders in low- and middle-income countries: summary of WHO recommendations. *PLoS Medicine*, 8(11), e1001122. doi:10.1371/journal.pmed.1001122

First, M., Spitzer, R., Gibbon, M., & Williams, J. (2002). Structured clinical interview for DSM-

IV Axis I disorders, research version, non-patient edition. *New York, NY: Biometrics Research Department, New York State Psychiatric Institute.*

Glantz, M. D., Bharat, C., Degenhardt, L., Sampson, N. A., Scott, K. M., Lim, C. C. W., . . .

Kessler, R. C. (2020). The epidemiology of alcohol use disorders cross-nationally: Findings from the World Mental Health Surveys. *Addict Behav*, 102, 106128. doi:10.1016/j.addbeh.2019.106128

Grant, B. F., Chou, S. P., Saha, T. D., Pickering, R. P., Kerridge, B. T., Ruan, W. J., . . . Hasin, D.

S. (2017). Prevalence of 12-Month Alcohol Use, High-Risk Drinking, and DSM-IV Alcohol Use Disorder in the United States, 2001-2002 to 2012-2013: Results From the National Epidemiologic Survey on Alcohol and Related Conditions. *JAMA Psychiatry*, 74(9), 911-923. doi:10.1001/jamapsychiatry.2017.2161

Gutierrez, J. I., Dubov, A., Altice, F. L., & Vlahov, D. (2021). Preferences for pre-exposure

prophylaxis among U.S. military men who have sex with men: results of an adaptive

choice based conjoint analysis study. *Mil Med Res*, 8(1), 32. doi:10.1186/s40779-021-00323-6

Harkness, J., Pennell, B., Villar, A., Gebler, N., Aguilar-Gaxiola, S., & Bilgen, I. (2008). Translation procedures and translation assessment in the World Mental Health Survey Initiative. *The WHO World Mental Health Surveys: Global perspectives on the epidemiology of mental disorders*, 91-113.

Haro, J. M., Arbabzadeh-Bouchez, S., Brugha, T. S., De Girolamo, G., Guyer, M. E., Jin, R., . . . Vilagut, G. (2006). Concordance of the Composite International Diagnostic Interview Version 3.0 (CIDI 3.0) with standardized clinical assessments in the WHO World Mental Health surveys. *International Journal of Methods in Psychiatric Research*, 15(4), 167-180.

Harris, M. G., Kazdin, A. E., Chiu, W. T., Sampson, N. A., Aguilar-Gaxiola, S., Al-Hamzawi, A., . . . Kessler, R. C. (2020). Findings From World Mental Health Surveys of the Perceived Helpfulness of Treatment for Patients With Major Depressive Disorder. *JAMA Psychiatry*, 77(8), 830-841. doi:10.1001/jamapsychiatry.2020.1107

Hora, S. C., Dodd, N. G., & Hora, J. A. (1993). The use of decomposition in probability assessments of continuous variables. 6(2), 133-147. doi:<https://doi.org/10.1002/bdm.3960060205>

Kessler, R. C., & Üstün, T. B. (2004). The World Mental Health (WMH) Survey Initiative version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *International Journal of Methods in Psychiatric Research*, 13(2), 93-121. doi:10.1002/mpr.168

Lago, L., Glantz, M. D., Kessler, R. C., Sampson, N. A., Al-Hamzawi, A., Florescu, S., . . . Torres de Galvis, Y. (2017). Substance dependence among those without symptoms of

substance abuse in the World Mental Health Survey. *International Journal of Methods in Psychiatric Research*, 26(3).

Lee, C. S., Longabaugh, R., Baird, J., Abrantes, A. M., Borrelli, B., Stein, L. A. R., . . . Gogineni, A. (2007). Do patient intervention ratings predict alcohol-related consequences? *Addictive Behaviors*, 32(12), 3136-3141. doi:10.1016/j.addbeh.2007.07.011

Mekonen, T., Chan, G. C. K., Connor, J., Hall, W., Hides, L., & Leung, J. (2020). Treatment rates for alcohol use disorders: a systematic review and meta-analysis. *Addiction*. doi:10.1111/add.15357

Müller, O., Baumann, C., Di Patrizio, P., Viennet, S., Vlamynck, G., Collet, L., . . . Bourion-Bédès, S. (2020). Patient's early satisfaction with care: a predictor of health-related quality of life change among outpatients with substance dependence. *Health and Quality of Life Outcomes*, 18(1), 6. doi:10.1186/s12955-019-1267-x

Nierenberg, A. A., Harris, M. G., Kazdin, A. E., Puac-Polanco, V., Sampson, N., Vigo, D. V., . . . Kessler, R. C. (2021). Perceived helpfulness of bipolar disorder treatment: Findings from the World Health Organization World Mental Health Surveys. *Bipolar Disord.* doi:10.1111/bdi.13066

Raney, V., Magaletta, P., & Hubbert, T. (2005). Perception of helpfulness among participants in a prison-based residential substance abuse treatment program. *Journal of Offender Rehabilitation*, 42(25-34).

Roberts, A., Mathers, B., Degenhardt, L., & on behalf of the Reference Group to the United Nations on HIV and injecting drug use. (2010). *Women who inject drugs: A review of their risks, experiences and needs*. Retrieved from Sydney. Accessed at: <https://ndarc.med.unsw.edu.au/sites/default/files/ndarc/resources/Women%20who%20inject%20drugs.pdf> on July 22nd 2021.:

Saenz, E., Busse, A., Tomas, J., & Clark, N. (2015). Major international challenges in addiction treatment: the experience of Treatnet and beyond. In *Textbook of Addiction Treatment: International Perspectives* (pp. 2459-2471): Springer.

SAS Institute Inc. (2020). (Version 9.4). Cary, NC, USA.

Stein, D. J., Harris, M. G., Vigo, D. V., Tat Chiu, W., Sampson, N., Alonso, J., . . . Kessler, R. C. (2020). Perceived helpfulness of treatment for posttraumatic stress disorder: Findings from the World Mental Health Surveys. *Depress Anxiety, 37*(10), 972-994. doi:10.1002/da.23076

Stein, D. J., Kazdin, A. E., Ruscio, A. M. R., Chiu, W. T., Sampson, N. A., Ziobrowski, H. N., . . . Zarkov, Z. (in press). Perceived helpfulness of treatment for generalized anxiety disorder: Findings from the World Mental Health Surveys. *BMC Psychiatry*. doi:10.1002/da.23076

The World Mental Health Survey Initiative. The World Mental Health Survey Initiative. Retrieved from <https://www.hcp.med.harvard.edu/wmh/> Accessed on July 22nd 2021.

Tomás-Rosselló, J., Rawson, R. A., Zarza, M. J., Bellows, A., Busse, A., Saenz, E., . . . Ling, W. (2010). United Nations Office on Drugs and Crime International Network of Drug Dependence Treatment and Rehabilitation Resource Centres: Treatnet. *Substance Abuse, 31*(4), 251-263. doi:10.1080/08897077.2010.514243

United Nations. (2015). *A/RES/70/1: Transforming our world: the 2030 Agenda for Sustainable Development. Resolution of the United Nations General Assembly Paper presented at the 70th Session of the United Nations General Assembly, September 25th 2015, New York, USA.*

http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&ampampLan

[g=E](#) Accessed on July 22nd 2021.

United Nations Office on Drugs and Crime. (2004). *Substance abuse treatment and care for women: Case studies and lessons learned*. Retrieved from Vienna:

Volkow, N. D., Poznyak, V., Saxena, S., Gerra, G., & Network, U.-W. I. I. S. (2017). Drug use disorders: impact of a public health rather than a criminal justice approach. *World Psychiatry, 16*(2), 213-214. doi:10.1002/wps.20428

Von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., & Vandenbroucke, J. P. (2007). The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *Bulletin of the World Health Organization, 85*, 867-872.

Wolter, K. (1985). *Introduction to variance estimation*: New York, NY: Springer-Verlag.

World Health Organization. (2010a). *ATLAS on substance use (2010): resources for the preventions and treatment of substance use disorders* Retrieved from Geneva:

World Health Organization. (2010b). *mhGAP intervention guide for mental, neurological and substance use disorders in non-specialized health settings: mental health Gap Action Programme (mhGAP)*. Geneva: WHO.

World Health Organization, & United Nations Office on Drugs and Crime. (2020). *International standards for the treatment of drug use disorders: revised edition incorporating results of field-testing*. Retrieved from Geneva:

Zhiwei, Z., Gerstein, D. R., & Friedmann, P. D. (2008). Patient satisfaction and sustained outcomes of drug abuse treatment. *J Health Psychol, 13*(3), 388-400. doi:10.1177/1359105307088142

Role of funding source

None.

Declaration of Interests

In the past three years, L.D. has received investigator-initiated untied educational grants for studies of opioid medications in Australia from Indivior and Seqirus. In the past 3 years, R.C.K was a consultant for Datastat, Inc., Holmusk, RallyPoint Networks, Inc., and Sage Pharmaceuticals. He has stock options in Mirah, PYM, and Roga Sciences. F. N-M. reports non-financial support from Otsuka outside and not-related to the submitted work. H.T has received a joint research grant from FUJIFILM Corporation. No other conflicts were declared.

Contributors

Dr Kessler had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. *Concept and design:* Harris, Vigo, Kessler, Kazdin, Degenhardt, Bharat. *Acquisition, analysis, or interpretation of data:* all authors. *Drafting of the manuscript:* Degenhardt, Bharat, Harris, Sampson, Kessler. *Critical revision of the manuscript for important intellectual content:* all authors.

Acknowledgements

The World Health Organization World Mental Health (WMH) Survey Initiative is supported by the United States National Institute of Mental Health (NIMH; R01 MH070884), the John D. and Catherine T. MacArthur Foundation, the Pfizer Foundation, the United States Public Health Service (R13-MH066849, R01-MH069864, and R01 DA016558), the Fogarty International Center (FIRCA R03-TW006481), the Pan American Health Organization, Eli Lilly

and Company, Ortho-McNeil Pharmaceutical Inc., GlaxoSmithKline, and Bristol-Myers Squibb.

L.D. is supported by an NHMRC Senior Principal Research Fellowship (1135991) and a US a National Institute of Health (NIH) National Institute on Drug Abuse (NIDA) grant (R01DA1104470). NDARC, UNSW Sydney, is supported by funding from the Australian Government Department of Health under the Drug and Alcohol Program.

We thank the staff of the WMH Data Collection and Data Analysis Coordination Centres for assistance with instrumentation, fieldwork, and consultation on data analysis. None of the funders had any role in the design, analysis, interpretation of results, or preparation of this paper. The views and opinions expressed in this report are those of the authors and should not be construed to represent the views of the World Health Organization, other sponsoring organizations, agencies, or governments.

The Argentina survey -- Estudio Argentino de Epidemiología en Salud Mental (EASM) -- was supported by a grant from the Argentinian Ministry of Health (Ministerio de Salud de la Nación) - (Grant Number 2002–17270/13 – 5). The 2007 Australian National Survey of Mental Health and Wellbeing was funded by the Australian Government Department of Health and Ageing. The São Paulo Megacity Mental Health Survey is supported by the State of São Paulo Research Foundation (FAPESP) Thematic Project Grant 03/00204-3. L.H.A is supported by the Brazilian Council for Scientific and Technological Development (CNPq Grant # 307933/2019-9). The Bulgarian Epidemiological Study of common mental disorders EPIBUL is supported by the Ministry of Health and the National Center for Public Health Protection. EPIBUL 2, conducted in 2016-17, is supported by the Ministry of Health and European Economic Area Grants. The Colombian National Study of Mental Health (NSMH) is

supported by the Ministry of Social Protection. The Mental Health Study Medellín – Colombia was carried out and supported jointly by the Center for Excellence on Research in Mental Health (CES University) and the Secretary of Health of Medellín. The ESEMeD project is funded by the European Commission (Contracts QLG5-1999-01042; SANCO 2004123, and EAHC 20081308), (the Piedmont Region (Italy)), Fondo de Investigación Sanitaria, Instituto de Salud Carlos III, Spain (FIS 00/0028), Ministerio de Ciencia y Tecnología, Spain (SAF 2000-158-CE), Departament de Salut, Generalitat de Catalunya, Spain, DIUE de la Generalitat de Catalunya (2017 SGR 452; 2014 SGR 748), Instituto de Salud Carlos III (CIBER CB06/02/0046, RETICS RD06/0011 REM-TAP), and other local agencies and by an unrestricted educational grant from GlaxoSmithKline. The Israel National Health Survey is funded by the Ministry of Health with support from the Israel National Institute for Health Policy and Health Services Research and the National Insurance Institute of Israel. The World Mental Health Japan (WMHJ) Survey is supported by the Grant for Research on Psychiatric and Neurological Diseases and Mental Health (H13-SHOGAI-023, H14-TOKUBETSU-026, H16-KOKORO-013, H25-SEISHIN-IPPAN-006) from the Japan Ministry of Health, Labour and Welfare. The Lebanese Evaluation of the Burden of Ailments and Needs Of the Nation (L.E.B.A.N.O.N.) is supported by the Lebanese Ministry of Public Health, the WHO (Lebanon), National Institute of Health / Fogarty International Center (R03 TW006481-01), anonymous private donations to IDRAAC, Lebanon, and unrestricted grants from, Algorithm, AstraZeneca, Benta, Bella Pharma, Eli Lilly, Glaxo Smith Kline, Lundbeck, Novartis, OmniPharma, Pfizer, Phenicia, Servier, UPO. The Mexican National Comorbidity Survey (MNCS) is supported by The National Institute of Psychiatry Ramon de la Fuente (INPRFMDIES 4280) and by the National Council on Science and Technology (CONACyT-G30544- H), with supplemental support from the Pan American Health Organization (PAHO). Te Rau Hinengaro: The New Zealand Mental

Health Survey (NZMHS) is supported by the New Zealand Ministry of Health, Alcohol Advisory Council, and the Health Research Council. The Nigerian Survey of Mental Health and Wellbeing (NSMHW) is supported by the WHO (Geneva), the WHO (Nigeria), and the Federal Ministry of Health, Abuja, Nigeria. The Northern Ireland Study of Mental Health was funded by the Health & Social Care Research & Development Division of the Public Health Agency. The Peruvian World Mental Health Study was funded by the National Institute of Health of the Ministry of Health of Peru. The Polish project Epidemiology of Mental Health and Access to Care –EZOP Project (PL 0256) was carried out by the Institute of Psychiatry and Neurology in Warsaw in consortium with Department of Psychiatry - Medical University in Wroclaw and National Institute of Public Health-National Institute of Hygiene in Warsaw and in partnership with Psykiatrist Institut Vinderen–Universitet, Oslo. The project was funded by the European Economic Area Financial Mechanism and the Norwegian Financial Mechanism. EZOP project was co-financed by the Polish Ministry of Health. The Portuguese Mental Health Study was carried out by the Department of Mental Health, Faculty of Medical Sciences, NOVA University of Lisbon, with collaboration of the Portuguese Catholic University, and was funded by Champalimaud Foundation, Gulbenkian Foundation, Foundation for Science and Technology (FCT) and Ministry of Health. The Romania WMH study projects "Policies in Mental Health Area" and "National Study regarding Mental Health and Services Use" were carried out by National School of Public Health & Health Services Management (former National Institute for Research & Development in Health, present National School of Public Health Management & Professional Development, Bucharest), with technical support of Metro Media Transilvania, the National Institute of Statistics – National Centre for Training in Statistics, SC Cheyenne Services SRL, Statistics Netherlands and were funded by Ministry of Public Health (former Ministry of Health) with supplemental

support of Eli Lilly Romania SRL. The South Africa Stress and Health Study (SASH) is supported by the US National Institute of Mental Health (R01-MH059575) and National Institute of Drug Abuse with supplemental funding from the South African Department of Health and the University of Michigan. The Psychiatric Enquiry to General Population in Southeast Spain – Murcia (PEGASUS-Murcia) Project has been financed by the Regional Health Authorities of Murcia (Servicio Murciano de Salud and Consejería de Sanidad y Política Social) and Fundación para la Formación e Investigación Sanitarias (FFIS) of Murcia. The US National Comorbidity Survey Replication (NCS-R) is supported by the National Institute of Mental Health (NIMH; U01-MH60220) with supplemental support from the National Institute of Drug Abuse (NIDA), the Substance Abuse and Mental Health Services Administration (SAMHSA), the Robert Wood Johnson Foundation (RWJF; Grant 044708), and the John W. Alden Trust.

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

Figure 1. Cumulative probabilities of alcohol abuse and/or dependence disorder treatment being perceived as helpful after each professional seen, among respondents with lifetime DSM-IV alcohol abuse and/or dependence disorder who obtained treatment

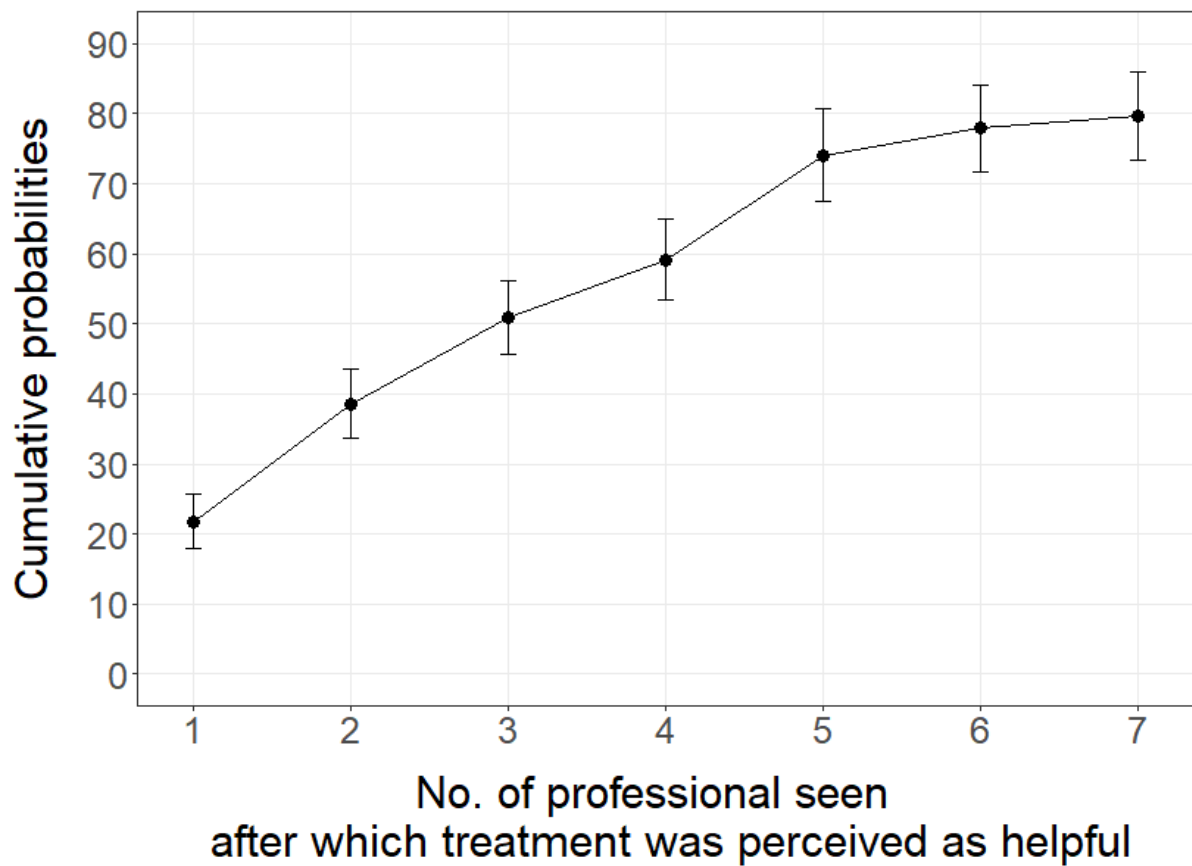


Table 1: WMH sample characteristics by World Bank income categories^a

Country	Sampling	Field dates	Age range	Sample size		Response rate
				Part 1	Part 2	
Low and middle income countries						
Colombia	All urban areas of the country (about 73% of the total national population)	2003	18-65	4,426	2,381	87.70%
Nigeria	21 of the 36 states in the country (about 57% of the national population)	2002-4	18-100	6,752	2,143	79.30%
Peru	Five urban areas of the country (about 38% of the total national population).	2004-5	18-65	3,930	1,801	90.20%
Brazil	São Paulo metropolitan area	2005-8	18-93	5,037	2,942	81.30%
Bulgaria	Nationally representative	2002-6	18-98	5,318	2,233	72.00%
Bulgaria 2	Nationally representative	2016-17	18-91	1,508	578	61.0%
Colombia-Medellin	Medellin metropolitan area	2011-12	19-65	3,261	1,673	97.20%
Lebanon	Nationally representative	2002-3	18-94	2,857	1,031	70.00%
Mexico	All urban areas of the country (about 75% of the total national population)	2001-2	18-65	5,782	2,362	76.60%
Romania	Nationally representative	2005-6	18-96	2,357	2,357	70.90%
South Africa	Nationally representative	2002-4	18-92	4,315	4,315	87.10%
Total				45,543	23,816	79.6
High income countries						
Argentina	Eight largest urban areas of the country (approximately 50% of the total national population)	2015	18-98	3,927	2,116	77.30%
Australia	Nationally representative	2007	18-85	8,463	8,463	60.00%
Belgium	Nationally representative	2001-2	18-95	2,419	1,043	50.60%
France	Nationally representative	2001-2	18-97	2,894	1,436	45.90%
Germany	Nationally representative	2002-3	19-95	3,555	1,323	57.80%
Israel	Nationally representative	2003-4	21-98	4,859	4,859	72.60%
Italy	Nationally representative	2001-2	18-100	4,712	1,779	71.30%
Japan	Eleven metropolitan areas	2002-6	20-98	4,129	1,682	55.10%
The Netherlands	Nationally representative	2002-3	18-95	2,372	1,094	56.40%
New Zealand	Nationally representative	2004-5	18-98	12,790	7,312	73.30%
Northern Ireland	Nationally representative	2005-8	18-97	4,340	1,986	68.40%
Poland	Nationally representative	2010-11	18-65	10,081	4,000	50.40%
Portugal	Nationally representative	2008-9	18-81	3,849	2,060	57.30%
Spain	Nationally representative	2001-2	18-98	5,473	2,121	78.60%
Spain-Murcia	Murcia region	2010-12	18-96	2,621	1,459	67.40%
United States	Nationally representative	2001-3	18-99	9,282	5,692	70.90%
Total				85,766	48,425	63.10%
Overall sample				131,309	72,241	68.00%

^a The World Bank (2012) Data. Accessed May 12, 2012 at: <http://data.worldbank.org/country>. Some of the WMH countries have moved into new income categories since the surveys were conducted. The income groupings above reflect the status of each country at the time of data collection. The current income category of each country is available at the preceding URL. Most WMH surveys are based on stratified multistage clustered area probability household samples in which samples of areas equivalent to counties or municipalities in the US were selected in the first stage followed by one or more subsequent stages of geographic sampling (e.g., towns within counties, blocks within towns, households within blocks) to arrive at a sample of households, in each of which a listing of household members was created and one or two people were selected from this listing to be interviewed. No substitution was allowed when the originally sampled household resident could not be interviewed. These household samples were selected from Census area data in all countries other than France (where telephone directories were used to select households) and the Netherlands (where postal registries were used to select households).

Table 2: Lifetime prevalence of DSM-IV alcohol abuse and/or dependence disorder (AUD), proportion of cases with lifetime alcohol abuse and/or dependence disorder who obtained treatment, and proportion of treated cases who perceived treatment as helpful

	% of lifetime AUD in the entire sample			% obtained treatment ¹ among respondents with lifetime AUD			% with treatment perceived to be helpful ² among respondents with lifetime AUD			% perceived treatment as helpful ² among cases that obtained lifetime AUD treatment ¹		
	n	%	SE	n	%	SE	n	%	SE	n	%	SE
Low- and Middle-Income Countries	39,940	6.7	0.2	2,511	6.4	0.8	2,511	3.0	0.4	163	46.8	5.3
Colombia	4426	9.4	0.6	336	3.8	1.5	336	1.9	1.2	14	51.0	19.3
Nigeria	6752	2.2	0.2	171	2.8	1.5	171	1.5	1.1	5	54.3	26.2
Peru	3930	5.7	0.4	209	5.9	2.0	209	4.9	1.8	12	83.9	9.7
Sao Paulo, Brazil	5037	9.8	0.6	476	14.8	3.1	476	5.5	1.2	66	37.3	7.8
Bulgaria	2811	3.5	0.4	138	4.2	1.7	138	2.4	1.5	11	58.0	17.5
Lebanon	2857	1.6	0.3	39	5.7	3.9	39	5.7	3.9	3	100.0	0.0
Medellin, Colombia	1673	12.8	1.4	238	2.9	1.0	238	1.9	0.9	11	66.6	15.7
Mexico	5782	8.0	0.6	383	4.4	1.3	383	1.8	0.7	18	40.7	14.7
Romania	2357	3.1	0.3	80	9.3	4.2	80	2.8	2.8	6	29.9	23.8
South Africa	4315	11.5	0.8	441	4.9	1.2	441	2.4	0.6	17	48.6	13.7
χ^2_9 between low- and middle-income countries	525.8			28.2			14.7			366.8		
High Income Countries	53,903	11.5	0.2	6,867	14.2	0.7	6,867	6.2	0.4	974	44.0	2.5
Argentina	2,116	8.2	0.7	240	2.8	1.4	240	2.1	1.0	14	76.4	8.2
Australia	8,463	22.7	0.6	1,806	15.5	1.6	1,806	6.2	1.1	251	39.8	5.9
Belgium	1,043	8.6	1.3	110	5.1	1.5	110	1.2	1.0	10	24.0	17.6
France	1,436	5.7	0.8	106	4.3	1.7	106	0.4	0.4	8	9.7	12.0
Germany	1,323	6.8	0.9	99	11.4	4.1	99	5.0	3.0	10	43.4	20.5
Israel	4,859	4.3	0.3	217	3.2	1.2	217	1.4	0.8	8	43.9	18.4
Italy	1,779	1.0	0.2	31	2.1	2.1	31	2.1	2.1	1	100.0	0.0
Japan	1,682	7.3	0.7	168	4.0	1.9	168	3.2	1.9	6	79.3	15.3
Murcia, Spain	1,459	6.4	0.6	93	8.6	3.1	93	8.6	3.2	10	99.3	0.7
Netherlands	1,094	7.9	1.1	112	8.1	4.0	112	1.4	0.9	10	17.1	12.5
New Zealand	12,790	12.1	0.4	1,723	18.0	1.2	1,723	7.2	0.8	319	39.9	3.7
Northern Ireland	1,986	13.2	1.0	276	14.2	3.0	276	5.0	1.6	44	35.1	8.4
Poland	4,000	11.1	0.5	521	14.0	2.2	521	10.3	1.7	75	73.6	5.3
Portugal	2,060	10.0	1.0	221	10.7	2.2	221	4.8	1.5	29	44.6	10.4
Spain	2,121	3.7	1.0	66	2.4	1.6	66	1.0	0.8	3	41.5	29.8
US	5,692	13.8	0.6	1,078	16.5	1.3	1,078	7.9	1.0	176	47.8	4.6
χ^2_{15} between high income countries	1,000.2			93.1			54.9			189.7		

All countries		93,843	9.5	0.1	9,378	11.8	0.5	9,378	5.3	0.3	1,137	44.5	2.3
	X^2_{25}	2,019.2			185.5			95.6			532.4		
X^2_1 between low/middle-income countries vs. High- income countries		290.4			40.8			23.5			0.2		

Abbreviations: SE, standard error; n, denominator

¹ Cases are based on three conditions: (i) Respondents obtained AUD treatment; (ii) Year of first AUD treatment was 1990 or later; and (iii) Age at onset of AUD was the year of first AUD treatment or earlier.

² Cases are based on four conditions: (i) Respondents obtained AUD treatment; (ii) Year of first AUD treatment was 1990 or later; (iii) Age at onset of AUD was the year of first AUD treatment or earlier; and (iv) Respondents obtained helpful treatment.

Table 3. Conditional and cumulative probability of persistence with treatment after previous unhelpful attempts, among respondents with lifetime DSM-IV alcohol abuse and/or dependence disorder who obtained treatment

No. of professionals seen if not helped by the previous one	I. Conditional probabilities									II. Cumulative probabilities					
	All			High-income countries			Low/middle income countries			All (n=896)		High-income countries (n=774)		Low/middle income countries (n=122)	
	n	%	(SE)	n	%	(SE)	n	%	(SE)	%	(SE)	%	(SE)	%	(SE)
2	896	61.5	1.6	774	62.9	1.8	122	53.9	2.8	61.5	1.6	62.9	1.8	53.9	2.8
3	438	64.0	3.2	387	61.2	3.6	51	81.5	2.8	39.3	2.6	38.5	2.9	43.9	5.9
4	224	75.8	2.8	201	73.4	3.3	23	88.5	2.9	29.8	2.4	28.3	2.6	38.9	6.3
5	138	67.1	4.9	122	66.0	5.6	16	71.5	10.3	20.0	2.3	18.6	2.3	27.8	7.2
6	58	70.2	4.8	50	84.9	4.5	8	26.2	2.1	14.0	2.3	15.8	2.4	7.3	4.6
7	35	94.2	1.1	33	93.5	1.4	2	100.0	0.0	13.2	2.3	14.8	2.4	7.3	4.6

Abbreviations: SE, standard error; n, denominator;

Table 4. Multivariate associations of factors with helpful treatment and persistence (pooled across professionals seen), and perceived helpfulness of treatment (person level), among people with lifetime DSM-IV alcohol abuse and/or dependence disorder (AUD) who obtained treatment

Factor	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 AUD clients			
	Prevalence		OR (95% CI)	Prevalence		OR (95% CI)	Prevalence		OR (95% CI)	
	Mean/%	(SE)		Mean/%	(SE)		Mean/%	(SE)		
Age of first AUD treatment	29.4	0.6	1.02* (1.01,1.04)	28.9	0.6	0.98 (0.95,1.00)	31.2	0.4	1.01 (0.99,1.03)	
	χ^2_1 (p-value)		8.28(0.004)*			3.05(0.08)			1.06(0.30)	
Gender										
	Female	30.9	2.6	0.75* (0.57,0.97)	33.1	3.1	0.78 (0.60,1.01)	25.7	1.5	0.68* (0.49,0.94)
	Male	69.1	2.6	1.0	66.9	3.1	1.0	74.3	1.5	1.0
	χ^2_1 (p-value)		4.73(0.030)*			3.48(0.06)			5.61(0.018)*	
Marital Status										
	Never married	60.3	2.6	1.41* (1.05,1.88)	60.5	3.0	0.91 (0.60,1.38)	56.6	1.7	1.26 (0.85,1.87)
	Previously married	19.2	1.6	1.26 (0.92,1.72)	19.1	1.7	1.32 (0.90,1.95)	19.2	1.2	1.45 (0.96,2.18)
	Currently married	20.5	1.7	1.0	20.4	2.0	1.0	24.2	1.4	1.0
	χ^2_2 (p-value)		5.84(0.05)			3.01(0.22)			3.62(0.16)	
Education										
	Low	16.8	3.4	1.12 (0.70,1.79)	17.7	4.1	1.46 (0.98,2.18)	13.3	1.1	1.24 (0.69,2.24)
	Low-average	22.8	2.0	1.46 (0.99,2.15)	22.4	2.3	1.60* (1.02,2.52)	22.6	1.5	1.55 (0.97,2.48)
	High-average	38.5	2.8	1.46* (1.00,2.12)	36.4	3.2	1.17 (0.84,1.61)	43.1	2.2	1.41 (0.90,2.19)
	Student	10.2	2.4	0.60 (0.33,1.09)	11.6	2.9	0.80 (0.46,1.40)	8.7	1.0	0.41* (0.20,0.82)
	High	11.7	1.3	1.0	12.0	1.6	1.0	12.4	1.3	1.0
	χ^2_4 (p-value)		11.81(0.019)*			8.70(0.07)			15.72(0.003)*	
Treatment delay (years) ^a										
		8.7	0.4	0.99 (0.97,1.00)	8.6	0.4	1.01 (0.99,1.03)	9.3	0.3	0.99 (0.97,1.01)
	χ^2_1 (p-value)		2.98(0.08)			0.34(0.56)			1.72(0.19)	
Started AUD treatment >= 2000		40.7	2.7	1.18	38.8	3.0	0.80	47.6	2.0	1.01 (0.70,1.44)

Factor	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 AUD clients			
	Prevalence		OR (95% CI)	Prevalence		OR (95% CI)	Prevalence		OR (95% CI)	
	Mean/ %	(SE)		Mean/ %	(SE)		Mean/ %	(SE)		
	(vs. 1990-1999)		(0.89,1.56)			(0.60,1.08)				
	χ^2_1 (p-value)		1.27(0.26)			2.15(0.14)			0.00(0.98)	
Treatment type ^b	Mental health specialist + Psychotherapy	61.0	2.8	1.86* (1.14,3.02)	60.2	3.2	1.90* (1.41,2.57)	53.0	2.2	2.62* (1.63,4.21)
	Mental health specialist + Medication	55.7	2.8	0.79 (0.55,1.13)	56.8	3.3	2.30* (1.74,3.05)	44.3	1.7	1.37 (0.92,2.05)
	General medical	73.1	1.8	1.10 (0.78,1.55)	74.6	2.0	1.82* (1.36,2.42)	69.1	1.5	1.62* (1.08,2.43)
	Complementary/alternative medicine	26.9	2.0	1.04 (0.81,1.33)	26.7	2.3	1.58* (1.14,2.19)	20.7	1.2	1.58* (1.10,2.28)
	Human services	19.0	1.9	1.0	19.5	2.2	1.0	15.4	1.4	1.0
	χ^2_4 (p-value)			7.43(0.11)			61.04(<.001)*			23.80(<.001)*
	Exactly 2 or more of the above	69.3	2.2	1.31 (0.82,2.09)	69.2	2.6	0.97 (0.71,1.33)	59.0	1.8	1.20 (0.70,2.06)
	χ^2_1 (p-value)			1.26(0.26)			0.04(0.85)			0.45(0.50)
Number of lifetime anxiety disorders ^c	2 or more	32.2	3.5	0.71* (0.51,0.99)	34.9	4.1	1.08 (0.82,1.44)	22.5	1.4	0.78 (0.51,1.19)
	Exactly 1	24.5	2.0	0.97 (0.70,1.34)	24.4	2.3	1.16 (0.85,1.58)	23.5	1.5	1.11 (0.75,1.64)
	No lifetime anxiety disorder	43.3	2.5	1.0	40.8	2.8	1.0	54.0	1.7	1.0
	χ^2_2 (p-value)			5.10(0.08)			0.92(0.63)			3.01(0.22)
Mood disorder	Major depressive disorder	25.4	2.2	0.78 (0.57,1.09)	26.6	2.5	0.84 (0.61,1.14)	23.0	1.5	0.70 (0.45,1.09)
	χ^2_1 (p-value)			2.09(0.15)			1.25(0.26)			2.54(0.11)
	Bipolar disorder	12.1	1.6	0.98 (0.69,1.38)	12.4	1.9	0.87 (0.60,1.26)	10.2	0.9	0.87 (0.54,1.41)
	χ^2_1 (p-value)			0.02(0.90)			0.55(0.46)			0.33(0.56)
Substance use disorder	Alcohol dependence	53.3	2.7	0.92 (0.69,1.22)	53.5	3.2	1.96* (1.52,2.54)	44.0	1.8	1.64* (1.19,2.27)
	χ^2_1 (p-value)			0.34(0.56)			26.29(<.001)*			9.04(0.003)*

Factor	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 AUD clients			
	Prevalence		OR (95% CI)	Prevalence		OR (95% CI)	Prevalence		OR (95% CI)	
	Mean/%	(SE)		Mean/%	(SE)		Mean/%	(SE)		
Drug abuse	54.2	2.8	1.21 (0.91,1.61)	55.0	3.3	1.95* (1.44,2.66)	42.9	1.9	2.10* (1.44,3.07)	
χ^2_1 (p-value)			1.65(0.20)			18.15(<.001)*			14.71(<.001)*	
Drug dependence	31.2	2.4	1.23 (0.82,1.83)	30.9	2.6	0.90 (0.64,1.27)	26.8	1.9	1.18 (0.75,1.87)	
χ^2_1 (p-value)			1.02(0.31)			0.35(0.55)			0.51(0.47)	
χ^2_7 (p-value) for all mental disorder indicators			10.75(0.15)			68.93(<.001)*			42.10(<.001)*	
Childhood Adversities	Family dysfunction ^d	41.4	3.3	0.81 (0.62,1.06)	43.1	3.8	0.94 (0.75,1.18)	33.7	1.6	0.84 (0.61,1.16)
	Other ^e	16.9	1.5	1.16 (0.83,1.63)	16.3	1.7	1.53* (1.13,2.08)	17.6	1.1	1.35 (0.87,2.10)
	χ^2_2 (p-value)			2.60(0.27)			7.71(0.021)*			2.63(0.27)
	Global χ^2_{24}			67.11(<.001)*			372.00(<.001)*			153.66(<.001)*

Abbreviations: SE, standard error; OR, odds ratio; CI, confidence interval. All mental disorder predictors were modelled as binary indicators.

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

^a Treatment delay (years) = Age at first AUD treatment – Age at onset of AUD

^b Treatment providers: mental health specialists (psychiatrist, psychiatric nurse, psychologist, psychiatric social worker, mental health counselor), 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).

^c Lifetime anxiety disorders include generalized anxiety disorder, panic disorder, agoraphobia with or without panic disorder, post-traumatic stress disorder, specific phobia and social phobia.

^d Family Dysfunction includes Physical abuse, Sexual abuse, Neglect, Parent mental disorder, Parent substance disorder, Parent criminal behavior and Family violence.

^e Other includes Parent died, Parent divorced, Other parent loss, Physical illness and Economic adversity.

Appendix

STROBE Statement
Checklist of items that should be included in reports of cross-sectional studies

	Item No	Recommendation	Page #
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	5
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	6-7
Objectives	3	State specific objectives, including any prespecified hypotheses	7
Methods			
Study design	4	Present key elements of study design early in the paper	8
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	8 and Appendix Table 2
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	8-9 incl. references
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	9-12
Data sources/measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	9-12
Bias	9	Describe any efforts to address potential sources of bias	12-13
Study size	10	Explain how the study size was arrived at	8
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	12-13
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	12-13
		(b) Describe any methods used to examine subgroups and interactions	12-13, 15, 17
		(c) Explain how missing data were addressed	10
		(d) If applicable, describe analytical methods taking account of sampling strategy	12
		(e) Describe any sensitivity analyses	17
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	8-9 incl. references
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Table 1 and Table 4
		(b) Indicate number of participants with missing data for each variable of interest	Appendix Table 1
Outcome data	15*	Report numbers of outcome events or summary measures	Table 1, 2 and 3
Main results	16	(a) Give unadjusted estimates and, if applicable,	p.15-17,

		confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Table 4
		(b) Report category boundaries when continuous variables were categorized	n/a
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	See Appendix
Discussion			
Key results	18	Summarise key results with reference to study objectives	18
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	20-21
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	18-20
Generalisability	21	Discuss the generalisability (external validity) of the study results	18
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	27

Appendix Table 1.

Group Category	Category	# of Missing that were imputed by each survey		
		Age of 1st Treatment	Age of 1st Helpful Treatment	Number of Professionals Seen
Low- and Middle-Income Countries	Colombia	0	0	1
	Nigeria	0	0	1
	Peru	0	0	1
	Sao Paulo, Brazil	1	0	5
	Bulgaria	2	0	1
	Lebanon	0	0	0
	Medellin, Colombia	0	0	0
	Mexico	0	0	2
	Romania	0	0	0
	South Africa	1	1	3
High Income Countries	Argentina	0	0	3
	Australia	1	0	3
	Belgium	0	0	0
	France	0	0	0
	Germany	0	0	0
	Israel	0	0	2
	Italy	0	0	0
	Japan	0	0	0
	Murcia, Spain	0	0	2
	Netherlands	0	0	1
	New Zealand	3	0	5
	Northern Ireland	0	0	0
	Poland	7	3	22
	Portugal	1	2	3
	Spain	0	0	0
US	0	0	4	
Total		16	6	59

Appendix Table 2. Conditional and cumulative probabilities of alcohol abuse and/or dependence disorder treatment being perceived as helpful after each professional seen, among respondents with lifetime DSM-IV alcohol abuse and/or dependence disorder who obtained treatment

No. of professional seen after which treatment was perceived as helpful	I. Conditional probabilities									II. Cumulative probabilities					
	All			High-income countries			Low/middle income countries			All (n=1,137)		High-income countries (n=974)		Low/middle income countries (n=163)	
	n	%	SE	n	%	SE	n	%	SE	%	SE	%	SE	%	SE
1	1137	21.8	2.0	974	21.4	2.3	163	23.5	3.3	21.8	2.0	21.4	2.3	23.5	3.3
2	566	21.5	1.8	498	21.1	2.0	68	24.1	2.1	38.6	2.5	38.0	2.7	42.0	6.0
3	294	20.1	2.6	255	18.7	2.8	39	26.7	5.6	50.9	2.7	49.6	3.0	57.5	7.0
4	170	16.9	2.9	150	17.9	3.5	20	12.6	2.4	59.2	2.9	58.6	3.2	62.8	7.3
5	93	36.5	5.6	81	40.1	7.0	12	23.1	2.6	74.1	3.4	75.2	3.7	71.4	7.8
6	42	14.7	3.9	40	16.2	4.3	2	0.0	0.0	77.9	3.2	79.2	3.4	71.4	7.8
7	32	7.8	1.6	30	2.7	0.6	2	46.4	0.0	79.7	3.2	79.8	3.4	84.7	10.9

Appendix Table 3: Interaction between main effects and country income group to predict helpful treatment and persistence (pooled across professionals seen), and perceived helpfulness of treatment (person level), among people with lifetime DSM-IV alcohol abuse and/or dependence disorder (AUD) who obtained treatment

Interaction terms between each predictor and high income countries		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 AUD patients		
		Distribution of Predictor		Multivariate	Distribution of Predictor		Multivariate	Distribution of Predictor		Multivariate
		MEAN/ %	(SE)	AOR (95% CI)	MEAN/ %	(SE)	AOR (95% CI)	MEAN/ %	(SE)	AOR (95% CI)
Gender	Female	29.1	2.6	0.89 (0.41,1.93)	31.3	3.1	1.08 (0.51,2.32)	23.5	1.5	1.43 (0.48,4.28)
	Male	55.6	2.8	1.0	53.8	3.3	1.0	60.2	1.8	1.0
		χ^2_1 (p-value)			0.09(0.76)			0.04(0.83)		
Education	Low	15.3	3.5	0.98 (0.31,3.07)	16.2	4.2	0.13* (0.06,0.30)	11.5	1.0	0.64 (0.16,2.52)
	Low-average	20.3	1.9	0.90 (0.34,2.40)	20.0	2.2	0.30* (0.11,0.78)	19.6	1.5	0.66 (0.22,2.05)
	High-average	30.0	2.6	0.92 (0.42,2.06)	28.2	2.9	0.46 (0.20,1.04)	35.2	2.3	0.56 (0.20,1.56)
	Student	9.9	2.4	1.8E5* (4.1E4,8.1E5)	11.2	2.9	0.47 (0.04,5.82)	8.2	1.0	2.7E5* (2.5E4,3.0E6)
	High	9.1	1.2	1.0	9.5	1.3	1.0	9.2	1.1	1.0
		χ^2_4 (p-value)			377.84(<.001)*			32.05(<.001)*		
Treatment type ^a	Mental health specialist + Psychotherapy	52.6	3.1	0.64 (0.26,1.57)	52.5	3.6	0.23* (0.12,0.43)	44.6	2.1	0.31* (0.13,0.73)
	Mental health specialist + Medication	50.2	3.0	0.38* (0.16,0.88)	51.7	3.5	0.61 (0.23,1.60)	38.6	1.7	0.31* (0.12,0.83)
	General medical	65.9	2.0	0.77 (0.38,1.57)	67.5	2.3	0.65 (0.40,1.06)	61.2	1.5	0.71 (0.30,1.68)
	Complementary/alternative medicine	23.3	1.9	1.84 (0.81,4.16)	23.2	2.2	0.75 (0.38,1.48)	17.4	1.1	1.69 (0.55,5.17)
	Human services	16.9	1.9	1.0	17.4	2.1	1.0	13.3	1.4	1.0
	Exactly 2 or more of the above	62.7	2.4	2.01 (0.76,5.31)	62.9	2.9	3.51* (1.70,7.26)	52.5	1.8	3.77* (1.14,12.53)
		χ^2_4 (p-value)			8.85(0.07)			23.39(<.001)*		
		χ^2_1 (p-value)			1.99(0.16)			11.54(<.001)*		
		χ^2_5 (p-value)			34.25(<.001)*			18.03(0.003)*		
Substance disorder	Alcohol dependence	45.1	2.9	0.72 (0.38,1.35)	45.7	3.4	0.88 (0.50,1.58)	36.1	1.6	0.71 (0.34,1.49)
	Drug abuse	47.7	3.1	1.10 (0.61,2.00)	48.6	3.6	0.39* (0.21,0.70)	38.0	1.9	0.88 (0.46,1.66)
				0.11(0.74)			9.78(0.002)*			0.16(0.68)
		χ^2_1 (p-value)			578.38(<.001)*			116.42(<.001)*		
		Global χ^2_{12}						144.24(<.001)*		

Abbreviations: SE, standard error; AOR, adjusted odds ratio; CI, confidence interval. * Significant at .05 level, two-sided test.

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

Appendix Table 4: Interaction between main effects and historical time to predict helpful treatment and persistence (pooled across professionals seen), and perceived helpfulness of treatment (person level), among people with lifetime DSM-IV alcohol abuse and/or dependence disorder (AUD) who obtained treatment

Interaction terms between each predictor and historical time		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 AUD patients			
		Distribution of Predictor		Multivariate	Distribution of Predictor		Multivariate	Distribution of Predictor		Multivariate	
		MEAN/ %	(SE)	AOR (95% CI)	MEAN/ %	(SE)	AOR (95% CI)	MEAN/ %	(SE)	AOR (95% CI)	
Gender	Female	10.3	1.2	0.62 (0.35,1.13)	10.8	1.4	1.23 (0.67,2.24)	11.3	1.1	0.79 (0.37,1.70)	
	Male	30.4	2.2	1.0	28.0	2.4	1.0	36.3	1.9	1.0	
		χ^2_1 (p-value)		2.45(0.12)			0.44(0.51)			0.37(0.54)	
Education	Low	5.2	0.7	1.03 (0.40,2.62)	5.4	0.8	2.34 (1.00,5.49)	5.9	0.7	1.73 (0.55,5.45)	
	Low-average	9.9	1.3	1.58 (0.73,3.42)	9.4	1.5	12.05* (4.77,30.44)	10.3	1.1	7.15* (2.74,18.63)	
	High-average	20.3	2.0	2.12 (0.94,4.78)	18.2	2.1	4.56* (2.15,9.67)	23.1	1.9	7.09* (2.83,17.78)	
	Student	2.0	0.4	0.92 (0.20,4.32)	2.2	0.5	1.02 (0.34,3.08)	3.0	0.7	1.85 (0.30,11.23)	
	High	3.4	0.7	1.0	3.7	0.7	1.0	5.3	1.0	1.0	
		χ^2_4 (p-value)		6.20(0.18)			37.04(<.001)*			27.27(<.001)*	
Treatment type ^a	Mental health specialist + Psychotherapy	21.7	1.8	1.14 (0.60,2.17)	19.5	1.8	0.99 (0.51,1.89)	23.3	1.9	1.22 (0.51,2.93)	
	Mental health specialist + Medication	20.2	1.8	1.33 (0.65,2.72)	19.1	2.0	0.97 (0.57,1.65)	20.7	1.3	1.32 (0.65,2.68)	
	General medical	28.9	2.4	0.71 (0.39,1.30)	28.3	2.7	0.65 (0.38,1.13)	33.7	2.2	0.54 (0.26,1.15)	
	Complementary/alternative medicine	8.7	1.0	0.54 (0.28,1.02)	8.5	1.0	1.13 (0.61,2.10)	7.9	0.8	0.51 (0.22,1.18)	
	Human services	7.5	1.1	1.0	7.7	1.2	1.0	6.6	0.9	1.0	
			χ^2_4 (p-value)		7.41(0.12)			3.40(0.49)			10.08(0.039)*
Substance disorder	Exactly 2 or more of the above	26.1	2.1	1.13 (0.48,2.67)	24.3	2.3	1.24 (0.61,2.50)	27.4	2.0	1.06 (0.38,2.92)	
			χ^2_1 (p-value)		0.08(0.78)			0.36(0.55)			0.01(0.91)
			χ^2_5 (p-value)		7.43(0.19)			4.13(0.53)			10.11(0.07)
Substance disorder	Alcohol dependence	21.8	1.8	0.93 (0.55,1.59)	20.7	2.1	0.68 (0.44,1.07)	22.3	1.3	0.89 (0.49,1.62)	
			χ^2_1 (p-value)		0.06(0.80)			2.77(0.10)			0.15(0.70)
	Drug abuse	18.4	1.7	1.19 (0.79,1.81)	17.3	1.7	0.97 (0.60,1.58)	18.1	1.9	1.11 (0.64,1.93)	
		χ^2_1 (p-value)		0.70(0.40)			0.01(0.92)			0.14(0.71)	
		Global χ^2_{12}		16.03(0.19)			45.57(<.001)*			47.29(<.001)*	

Abbreviations: SE, standard error; AOR, adjusted odds ratio; CI, confidence interval.

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

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

Appendix Table 5: Lifetime prevalence of DSM-IV alcohol abuse and/or dependence disorder (AUD) ONLY, proportion of cases with lifetime alcohol abuse and/or dependence disorder ONLY who obtained treatment, and proportion of treated cases who perceived treatment as helpful

Category	In the entire sample			Among respondents with lifetime AUD ONLY						Among cases that obtained lifetime AUD ONLY treatment ¹		
	% of lifetime AUD ONLY			% obtained treatment ¹			% with treatment perceived to be helpful ²			% perceived treatment as helpful ²		
	n	%	SE	n	%	SE	n	%	SE	n	%	SE
Low- and Middle-Income Countries	39,940	5.7	0.2	2,124	5.0	0.7	2,124	2.0	0.4	109	40.6	5.9
Colombia	4,426	8.2	0.6	283	3.7	1.7	283	1.7	1.3	10	45.9	22.8
Nigeria	6,752	2.1	0.2	160	2.3	1.4	160	0.9	0.9	3	40.0	30.4
Peru	3,930	4.9	0.3	181	5.3	1.9	181	4.2	1.8	9	79.3	13.5
Sao Paulo, Brazil	5,037	8.1	0.5	395	11.5	2.8	395	3.6	0.9	44	31.1	7.5
Bulgaria	2,811	3.4	0.4	133	4.1	1.8	133	2.3	1.5	10	56.1	18.5
Lebanon	2,857	1.5	0.3	37	1.6	1.5	37	1.6	1.5	2	100.0	0.0
Medellin, Colombia	1,673	9.5	1.3	169	0.7	0.4	169	0.3	0.3	3	42.2	29.6
Mexico	5,782	6.8	0.5	316	3.6	1.4	316	0.8	0.5	11	21.2	14.5
Romania	2,357	3.1	0.3	80	9.3	4.2	80	2.8	2.8	6	29.9	23.8
South Africa	4,315	9.5	0.7	370	3.2	0.9	370	1.8	0.5	11	57.0	15.1
X^2_9 between low- and middle-income countries	393.6			30.2			13.7			210.6		
High Income Countries	52,124	8.6	0.2	4,911	9.7	0.6	4,911	3.7	0.3	500	37.7	2.8
Argentina	2,116	6.2	0.7	178	1.3	0.7	178	1.3	0.7	5	100.0	0.0
Australia	8,463	17.3	0.6	1,412	10.0	1.3	1,412	2.1	0.4	131	21.4	4.5
Belgium	1,043	7.6	1.3	98	5.4	1.7	98	1.4	1.1	9	25.4	18.2
France	1,436	4.9	0.7	87	5.0	2.0	87	0.5	0.5	8	9.7	12.0
Germany	1,323	6.4	0.9	88	9.7	4.2	88	5.1	3.2	7	52.6	25.1
Israel	4,859	3.6	0.3	180	2.0	1.0	180	0.5	0.4	5	26.7	18.5
Japan	1,682	7.1	0.7	162	4.1	2.0	162	3.2	1.9	6	79.3	15.3
Murcia, Spain	1,459	4.6	0.7	69	7.8	4.2	69	7.7	4.2	7	99.0	1.2
Netherlands	1,094	7.1	1.0	98	3.6	1.5	98	1.0	0.8	7	26.6	18.6
New Zealand	12,790	7.3	0.3	1,040	12.1	1.3	1,040	4.2	0.8	131	34.8	5.4
Northern Ireland	1,986	10.8	0.9	228	10.5	2.7	228	2.4	0.9	31	23.2	6.9
Poland	4,000	10.4	0.5	484	13.8	2.1	484	10.1	1.6	70	73.1	5.8
Portugal	2,060	10.0	1.0	221	10.7	2.2	221	4.8	1.5	29	44.6	10.4
Spain	2,121	3.0	0.9	49	2.3	1.9	49	0.5	0.6	2	23.6	25.5
US	5,692	6.9	0.4	517	10.4	1.4	517	4.8	0.6	52	46.3	5.2
X^2_{14} between high income countries	603.3			53.9			72.1			777.4		

All Countries		92,064	7.4	0.1	7,035	8.1	0.5	7,035	3.1	0.2	609	38.3	2.6
	X^2_{24}	1,242.1			112.9			100.9			988.2		
X^2_1 between low/middle-income countries vs. High- income countries		142.6			19.7			9.2			0.2		

Abbreviations: SE, standard error

¹ Cases are based on three conditions: (i) Respondents obtained AUD ONLY treatment; (ii) Year of first AUD ONLY treatment was 1990 or later; and (iii) Age at onset of AUD ONLY was the year of first AUD ONLY treatment or earlier.

² Cases are based on four conditions: (i) Respondents obtained AUD ONLY treatment; (ii) Year of first AUD ONLY treatment was 1990 or later; (iii) Age at onset of AUD ONLY was the year of first AUD ONLY treatment or earlier; and (iv) Respondents obtained helpful treatment.

Appendix Table 6: Conditional and cumulative probabilities of alcohol abuse and/or dependence disorder only treatment being perceived as helpful after each professional seen, among respondents with lifetime DSM-IV alcohol abuse and/or dependence disorder ONLY

No. of professional seen after which treatment was perceived as helpful	I. Conditional probabilities									II. Cumulative probabilities					
	All			High-income countries			Low/middle income countries			All (n=609)		High-income countries (n=500)		Low/middle income countries (n=109)	
	n	%	(SE)	n	%	(SE)	n	%	(SE)	%	(SE)	%	(SE)	%	(SE)
1	609	22.5	1.5	500	21.8	1.7	109	25.4	2.4	22.5	1.5	21.8	1.7	25.4	2.4
2	248	18.4	2.1	211	17.7	2.4	37	22.9	3.6	36.8	3.0	35.6	3.2	42.5	7.4
3	108	24.6	4.2	87	24.0	4.7	21	26.8	9.3	52.4	4.0	51.1	4.6	57.9	8.7
4	58	9.2	1.8	47	8.1	1.7	11	12.4	5.1	56.7	4.3	55.0	4.9	63.2	9.4
5	30	53.6	9.7	24	63.2	11.1	6	25.1	7.0	79.9	5.3	83.4	5.4	72.4	10.4

Abbreviations: SE, standard error; n, denominator.

Appendix Table 7: Conditional and cumulative probability of persistence with treatment after previous unhelpful attempts, among respondents with lifetime DSM-IV alcohol abuse and/or dependence disorder ONLY who obtained treatment

No. of professionals seen if not helped by the previous one	I. Conditional probabilities									II. Cumulative probabilities					
	All			High-income countries			Low/middle income countries			All (n=459)		High-income countries (n=379)		Low/middle income countries (n=80)	
	n	%	(SE)	n	%	(SE)	n	%	(SE)	%	(SE)	%	(SE)	%	(SE)
2	459	52.2	2.5	379	56.1	2.9	80	36.7	3.0	52.2	2.5	56.1	2.9	36.7	3.0
3	191	48.1	5.0	163	43.2	5.3	28	80.4	5.8	25.1	3.0	24.2	3.4	29.5	6.3
4	78	78.9	4.0	65	75.2	4.9	13	92.7	6.5	19.8	3.0	18.2	3.3	27.3	6.6
5	52	56.5	9.9	43	55.8	11.8	9	58.5	18.6	11.2	2.4	10.2	2.6	16.0	5.9

Appendix Table 8: Factors associated with helpful treatment and persistence (pooled across professionals seen), and perceived helpfulness of treatment (person level), among people with lifetime DSM-IV alcohol abuse and/or dependence disorder (AUD) ONLY who obtained treatment

Factor	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 AUD ONLY patients			
	Distribution of Predictor			Distribution of Predictor			Distribution of Predictor			
	MEAN/ %	(SE)	AOR (95% CI)	MEAN/ %	(SE)	AOR (95% CI)	MEAN/ %	(SE)	AOR (95% CI)	
Age of first AUD ONLY treatment	34.8	0.7	1.04* (1.02,1.05)	34.5	0.8	0.98 (0.95,1.01)	35.5	0.5	1.03* (1.00,1.05)	
χ^2_1 (p-value)			19.89(<.001)*			1.41(0.24)			3.92(0.048)*	
Gender	Female	28.1	2.2	0.63* (0.42,0.92)	30.4	2.6	0.65* (0.43,0.99)	25.4	1.7	0.53* (0.34,0.83)
	Male	71.9	2.2	1.0	69.6	2.6	1.0	74.6	1.7	1.0
χ^2_1 (p-value)			5.56(0.018)*			4.04(0.045)*			7.60(0.006)*	
Marital Status	Never married	41.3	2.9	2.59* (1.89,3.54)	39.1	3.6	0.99 (0.56,1.76)	43.9	2.3	2.12* (1.30,3.47)
	Previously married	25.1	2.3	1.25 (0.81,1.92)	26.0	2.8	1.28 (0.82,2.01)	22.6	1.8	1.53 (0.90,2.60)
	Currently married	33.6	2.7	1.0	34.9	3.1	1.0	33.4	2.1	1.0
χ^2_2 (p-value)			35.28(<.001)*			1.43(0.49)			9.44(0.009)*	
Education	Low	12.4	1.4	1.45 (0.67,3.14)	12.3	1.7	1.85* (1.12,3.05)	12.6	1.2	1.62 (0.79,3.33)
	Low-average	26.2	2.6	1.35 (0.86,2.11)	26.7	2.9	2.15* (1.09,4.21)	22.9	2.0	1.66* (1.01,2.73)
	High-average	40.2	3.0	1.59 (0.93,2.72)	38.7	3.6	1.20 (0.76,1.90)	42.9	2.3	1.45 (0.87,2.42)
	Student	3.7	0.7	0.55 (0.20,1.51)	4.3	0.8	0.99 (0.41,2.38)	4.2	0.6	0.59 (0.18,1.86)
	High	17.5	1.9	1.0	18.1	2.4	1.0	17.4	1.8	1.0
χ^2_4 (p-value)			7.26(0.12)			10.88(0.028)*			7.16(0.13)	
Treatment delay (years) ^a	10.2	0.5	0.99 (0.97,1.00)	10.2	0.6	1.01 (0.98,1.03)	10.4	0.4	0.99 (0.97,1.01)	
χ^2_1 (p-value)			2.88(0.09)			0.34(0.56)			1.97(0.16)	
Started AUD ONLY treatment >= 2000 (vs. 1990-1999)	48.8	3.1	1.60* (1.18,2.18)	47.0	3.6	0.75 (0.46,1.22)	52.2	2.5	1.10 (0.72,1.68)	
χ^2_1 (p-value)			9.10(0.003)*			1.35(0.25)			0.21(0.65)	
Treatment type ^b	Mental health specialist + Psychotherapy	48.4	2.6	0.82 (0.56,1.20)	44.9	3.0	1.74* (1.06,2.86)	45.9	1.9	1.42 (0.87,2.32)
	Mental health specialist + Medication	51.5	2.9	0.79 (0.50,1.25)	50.7	3.4	1.96* (1.29,2.98)	44.1	2.1	1.25 (0.80,1.95)
	General medical	74.3	1.8	0.47* (0.31,0.72)	78.2	2.1	1.92* (1.20,3.08)	69.9	1.5	0.83 (0.53,1.31)
	Complementary/alternative medicine	20.1	2.0	1.10 (0.72,1.69)	18.4	2.1	2.48* (1.47,4.18)	16.1	1.3	2.70* (1.64,4.45)
	Human services	15.5	2.0	1.0	15.9	2.4	1.0	13.0	1.6	1.0
	χ^2_4 (p-value)			17.23(0.002)*			31.93(<.001)*			19.94(<.001)*
Exactly 2 or more of the	60.3	2.6	1.99* (1.16,3.44)	59.0	3.1	1.02 (0.59,1.77)	52.7	2.1	1.39 (0.77,2.52)	

		above									
		χ^2_5 (p-value)		22.26(<.001)*		53.89(<.001)*		36.40(<.001)*			
Number of lifetime anxiety disorders ^c	2 or more lifetime anxiety disorders	22.1	3.1	0.65 (0.41,1.03)	24.3	3.8	0.74 (0.47,1.16)	18.3	2.3	0.63 (0.35,1.12)	
	Exactly 1 lifetime anxiety disorder	21.5	2.2	1.02 (0.66,1.59)	21.5	2.5	0.93 (0.62,1.41)	20.2	1.6	1.12 (0.68,1.84)	
	No lifetime anxiety disorder	56.4	2.8	1.0	54.3	3.3	1.0	61.5	2.1	1.0	
	χ^2_2 (p-value)			3.88(0.14)			1.74(0.42)			3.49(0.17)	
Mood disorder	Major depressive disorder	25.2	2.6	1.03 (0.62,1.72)	26.6	3.1	0.95 (0.56,1.59)	21.6	2.2	1.02 (0.53,1.97)	
	χ^2_1 (p-value)			0.01(0.91)			0.04(0.83)			0.00(0.96)	
	Bipolar disorder	8.2	2.7	0.82 (0.37,1.78)	8.9	3.3	1.36 (0.64,2.91)	6.1	1.2	1.00 (0.37,2.71)	
χ^2_1 (p-value)			0.26(0.61)			0.63(0.43)			0.00(1.00)		
Substance disorder	Alcohol dependence	48.1	2.8	1.33 (0.99,1.79)	45.8	3.2	2.12* (1.41,3.19)	41.0	1.9	2.30* (1.63,3.24)	
	χ^2_1 (p-value)			3.52(0.06)			13.05(<.001)*			22.30(<.001)*	
χ^2_5 (p-value) for all mental disorder indicators				7.89(0.16)			15.19(0.010)*			29.64(<.001)*	
Childhood Adversities	Family Dysfunction ^d	29.8	2.1	0.99 (0.73,1.35)	29.1	2.4	1.02 (0.69,1.49)	28.4	1.5	1.01 (0.68,1.51)	
	Other ^e	17.6	2.1	0.56* (0.32,0.98)	17.6	2.4	1.43 (0.79,2.58)	16.3	1.4	0.77 (0.39,1.52)	
	χ^2_2 (p-value)			4.19(0.12)			1.43(0.49)			0.65(0.72)	
Global χ^2_{22}				113.26(<.001)*			214.27(<.001)*			133.18(<.001)*	

Abbreviations: SE, standard error; AOR, adjusted odds ratio; CI, confidence interval.

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

^a Treatment delay (years) = Age at first AUD treatment – Age at onset of AUD

^b Treatment providers: mental health specialists (psychiatrist, psychiatric nurse, psychologist, psychiatric social worker, mental health counselor), 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).

^c Lifetime anxiety disorders include generalized anxiety disorder, panic disorder, agoraphobia with or without panic disorder, post-traumatic stress disorder, specific phobia and social phobia.

^d Family Dysfunction includes Physical abuse, Sexual abuse, Neglect, Parent mental disorder, Parent substance disorder, Parent criminal behavior and Family violence.

^e Other includes Parent died, Parent divorced, Other parent loss, Physical illness and Economic adversity.