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Twelve-month treatment of mental disorders in the Saudi National Mental Health Survey

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Abstract

Objectives: To estimate treatment rates of 12-month mental disorders in the Saudi National Mental Health Survey (SNMHS).

Methods: The SNMHS is a face-to-face community epidemiological survey in a nationally representative household sample of citizens ages 15–65 in the Kingdom of Saudi Arabia (KSA) (n = 4,004). The World Health Organization Composite International Diagnostic Interview (CIDI) was used to produce estimates of 12-month prevalence and treatment of common DSM-IV mental disorders.

Results: About one eighth (13.7%) of respondents with a 12-month DSM-IV/CIDI disorder received 12-month treatment. The highest proportion of treatment occurred in the general medical sector (53.0%). Close to half (45.2%) of patients received treatment rated at least minimally adequate using standard treatment guidelines. Although serious disorders were significantly more likely to be treated (20.2%) than mild or moderate disorders (8.5–10.7%), no association was found between disorder severity and probability of receiving adequate treatment. Sociodemographic correlates were for the most part nonsignificant.

Conclusions: A high level of unmet need for treatment of mental disorders exists in KSA. Further analyses of the SNMHS data might provide insights into modifiable barriers to treatment and policy options to address the problem of unmet need for treatment.

KEYWORDS
barriers to treatment, mental disorders, treatment rates, unmet need for treatment

1 | INTRODUCTION

Mental disorders have substantial societal costs due to their combination of high prevalence and strong negative effects on productive role functioning (Alonso, Chatterji, & He, 2013; GBD 2015 Disease and Injury Incidence and Prevalence Collaborators, 2016). Fortunately, treatments exist that can restore this functioning for many patients (Andrews, Issakidis, Sanderson, Corry, & Lapsley, 2004; Chisholm et al., 2016; World Health Organization, 2010), making it cost-effective from a societal perspective to provide evidence-based

treatments to patients with these disorders (Bertram et al., 2018; Campion & Knapp, 2018). However, mental disorder treatment rates remain low around the world both in terms of the proportion of people with these disorders who are treated at all and the quality of the treatment received (Alonso et al., 2018; Degenhardt et al., 2017; Thornicroft et al., 2017).

The current article presents data on patterns and correlates of mental disorder treatment in the Saudi National Mental Health Survey (SNMHS), a nationally representative general population household survey in the Kingdom of Saudi Arabia (KSA). The focus is on treatment in the 12 months before the survey of respondents who reported having a mental disorder during that time period. The SNMHS is part of the World Health Organization (WHO) World Mental Health (WMH) Survey Initiative (Alonso et al., 2013; Kessler & Üstün, 2008; Scott, de Jonge, Stein, & Kessler, 2018). WMH carries out coordinated psychiatric epidemiological surveys of common mental disorders in countries throughout the world. Standardized methods are used to provide valid data on the prevalence, burden, and treatment of mental disorders for policy planning purposes (Harkness et al., 2008; Heeringa et al., 2008; Pennell et al., 2008). An earlier report in this issue found that the lifetime mental disorder treatment rate in the SNMHS was low relative to the treatment rates found in WMH surveys carried out in other high-income countries (Al-Subaie et al., 2020). It might be, though, that untreated cases are much less persistent or severe than treated cases, in which case recent treatment of recent cases might be considerably higher than lifetime treatment of lifetime cases. That possibility is explored in the current article.

Prior to the SNMHS, Lebanon and Iraq were the only two countries in the Arab world to publish information at the national level on 12-month treatment of mental disorders based on representative population samples assessed in epidemiological surveys. The Iraqi study showed that only 10.8% of those with a recent mental disorder obtained any treatment in the 12 months before interview, that probability of receiving treatment was much higher among people with serious than mild or moderate disorders, and that most treatment was provided in the general medical sector (Alhasnawi et al., 2009). Very similar results were found in Lebanon, where only 10.9% of people with a 12-month mental disorder obtained treatment (Karam et al., 2006). The treatment rates in Iraq and Lebanon among survey respondents with serious 12-month disorders were comparable to those found in WMH surveys carried out in other countries with similar levels of economic development (Wang et al., 2007). However, treatment rates in the Iraq and Lebanon surveys among people with mild and moderate 12-month mental disorders were considerably lower than in other WMH surveys in countries with similar levels of economic development.

Cross-national comparisons of WMH survey results find that mental disorder treatment rates generally increase with increasing country-level income (Alonso et al., 2018; Degenhardt et al., 2017; Thornicroft et al., 2017). This would suggest that, all else equal, a higher treatment rate would be expected in the SNMHS than in the Iraq and Lebanon WMH surveys. This expectation is indirectly consistent with the fact that KSA devotes a higher proportion of its total healthcare expenditures to the treatment of mental disorders (4%) than the worldwide average (less than 2%) (World Health Organization, 2018). As a result of this

investment, most Saudi citizens have free access to psychoactive medications, nondrug psychological treatments, and social services for the treatment of mental disorders. But does this high access translate into a high rate of treatment among Saudi citizens with mental disorders? We provide the first nationally representative data on this question in the current report.

2 | METHODS

2.1 | Sample

As detailed elsewhere (Shahab et al., 2017; Mneimneh, Heeringa, Lin, Altwaijri, & Nishimura, 2020), the SNMHS is a national household survey of Saudi citizens ages 15–65 exclusive of the two administrative areas involved in political conflict at the time of the survey (Jazan and Najran). Respondents were selected from a multistage clustered area probability household sample. Face-to-face interviews were carried out by trained lay interviewers. The estimated response rate was 61% using the American Association of Public Opinion Research RR2 definition (American Association for Public Opinion Research, 2016). (The response rate was "estimated" because we had to estimate resident eligibility data for households in which we were not able to obtain a listing. We assumed that the eligibility rate in these households was comparable to that of households in the same area in which we were able to obtain a household listing for purposes of calculating the estimated response rate.) We attempted to interview one randomly selected male and one randomly selected female in households that contained both males and females in the age range 15–65 and only one randomly selected respondent in households in which eligible residents were either all male or all female. A total of 4,004 interviews were completed. All interviews were conducted face-to-face by trained lay interviewers. The 61% response rate is comparable to the response rates in other WMH surveys in high-income countries (e.g., 60% in Australia and 57.8% in Germany; Kessler, Heeringa, Pennell, Sampson, & Zaslavsky, 2018).

As in other WMH surveys, a two-part case–control sampling design was used in the SNMHS to reduce the interview burden on respondents who did not meet criteria for any of the core mental disorders assessed in the survey. All respondents completed Part I of the interview, which assessed core disorders. All Part I respondents who met lifetime criteria for any of these disorders plus a probability subsample of other Part I respondents were then administered Part II, which assessed disorders of secondary interest and a wide range of correlates. A total of $n = 1,981$ respondents were administered the Part II interview, whereas the remaining $n = 2,023$ (i.e., 4,004 − 1,981) Part I respondents were terminated after completing Part I. The Part I sample was weighted to adjust for differential probabilities of selection within and between households and to match sample distributions to population distributions on the cross-classification of key sociodemographic and geographic data. The Part II sample was then additionally weighted for the undersampling of Part I respondents without core disorders, resulting in the prevalence estimates of core disorders in the weighted Part II sample being identical to those in the Part I sample.

2.2 | Measures

2.2.1 | Field procedures

All interviews were carried out face-to-face by trained lay interviewers. The interview schedule and all training materials were translated and adapted using a standardized WHO translation protocol (Harkness et al., 2008; Shahab et al., 2019). Interviewer training procedures and field quality control procedures were used consistent with those in other WMH surveys (Heeringa et al., 2008; Pennell et al., 2008). Interviewers followed a strict fieldwork protocol to guarantee data quality. Details of these quality assurance and quality control procedures are described elsewhere (Hyder et al., 2017). Study procedures conformed to the international standards set by the Declaration of Helsinki. Written informed consent was obtained from respondents prior to beginning each interview. These consent procedures were approved by the Institutional Review Board at the King Faisal Hospital and Research Center.

2.2.2 | Mental disorders

Diagnosis was based on the WHO Composite International Diagnostic Interview Version 3.0 (CIDI 3.0; Kessler & Üstün, 2004), the same diagnostic interview schedule used in all other WMH surveys. The CIDI is a fully structured interview that is designed to be used by trained lay interviewers and that generates diagnoses based on the criteria of both the ICD-10 (World Health Organization, 1991) and DSM-IV (American Psychiatric Association, 2000) diagnostic systems. DSM-IV criteria are used here.

As discussed in more detail elsewhere in this issue (Kessler et al., 2020) diagnoses based on the CIDI have been shown to have good concordance with diagnoses based on blinded clinician interviews in previous WMH surveys (Haro et al., 2006). However, we modified the diagnostic thresholds for three disorders thought to be of special relevance to KSA: obsessive–compulsive disorder, separation anxiety disorder, and social phobia. Prevalence estimates of these disorders are likely to be conservative in the SNMHS. As a result, subthreshold manifestations of these disorders will be the focus of separate attention in subsequent analyses that will be reported as results become available. Retrospective age-of-onset (AOO) information was obtained for all disorders by asking a series of questions designed to avoid recall bias and maximize response rates (American Psychiatric Association, 2000; Kessler & Üstün, 2004; World Health Organization, 1991). Organic exclusion rules and hierarchy rules were used to make all diagnoses.

Patterns of treatment for the 19 disorders considered in the SNMHS were examined separately and also grouped into broad categories of anxiety disorders (i.e., panic disorder, agoraphobia without panic disorder, social phobia, generalized anxiety disorder, post-traumatic stress disorder, obsessive–compulsive disorder, and separation anxiety disorder), mood disorders (i.e., major depressive disorder, bipolar I–II disorder [BPD]), eating disorders (i.e., anorexia nervosa, bulimia nervosa, binge-eating disorder), disruptive behavior disorders (i.e., attention-deficit/hyperactivity disorder, conduct disorder, oppositional defiant disorder, intermittent explosive disorder), and substance use disorders (i.e., alcohol and drug abuse and dependence).

2.2.3 | Disorder severity

Disorders were classified as either serious, moderate, or mild using criteria developed and used in previous WMH analyses (Kessler et al., 2009). Twelve-month disorders were classified as *serious* if they met one or more of the following criteria: (a) The disorder was either a bipolar I disorder or substance dependence with a physiological dependence syndrome; (b) a suicide attempt occurred in conjunction with a core disorder; or (c) the respondent reported more than a week of being out of role because of a core disorder in the past 12 months; or (d) the respondent reported severe impairment in at least three of the four areas of role functioning associated with a core disorder in the modified version of the Sheehan Disability Scale (SDS; Sheehan, Harnett-Sheehan, & Raj, 1996) used in the WMH surveys (Ormel et al., 2013). Disorders not classified serious were classified *moderate* if the respondent reported at least moderate impairment in any SDS domain or if the respondent had substance dependence without a physiological dependence syndrome. All other disorders were classified *mild*.

2.2.4 | Treatment

All Part II respondents were asked if they ever obtained treatment from each of 14 different types of professionals for problems with emotions, nerves, mental health or use of alcohol or drugs. If so, questions were asked about age at first obtaining treatment, treatment in the past 12 months, and, when 12-month treatment was reported, number of visits from each of these types of professionals. Summary measures of 12-month treatment were created separately for the *healthcare* sector and the *non-healthcare* sector. *Healthcare sector* treatment was further divided into treatment in the *general medical sector* (family physicians, general practitioners, and other medical doctors, such as cardiologists or gynecologists–urologists, nurses, occupational therapists, and other general healthcare professionals) and the *mental health specialty sector* (psychiatrists and other mental health professionals such as psychologists, counselors, psychotherapists, mental health nurses, and social workers in a mental health specialty setting). *Non-healthcare* sector was classified into *human services* (including social workers or counselors in any setting other than a specialty mental health setting, and religious or spiritual advisors, such as a minister, priest, or rabbi) and *complementary-alternative medicine (CAM)* (including internet use, self-help groups, any other healer, such as an herbalist, a chiropractor, or a spiritualist, and other alternative therapy). We did not distinguish between inpatient and outpatient treatment, but all inpatient treatment was coded as mental health specialty treatment.

2.2.5 | Adequacy of treatment

Based on the definition established in prior WMH surveys (Wang et al., 2005, 2007) and used extensively thereafter (e.g., Alonso

et al., 2018; Degenhardt et al., 2017; Thornicroft et al., 2017), we defined minimally adequate treatment during the previous 12 months as having either: (a) four or more outpatient visits for treatment with any provider; or (b) still being in treatment at the time of the interview. Although this definition is broader than used in published treatment guidelines, it allows us to obtain conservative estimates of minimally adequate treatment across sectors.

2.2.6 | Sociodemographic correlates

The sociodemographic correlates considered here include age, gender, education, family income, and marital status. Age was coded in rough quartiles of 15–24, 25–34, 35–49, and 50–65 years of age. Education distinguished between respondents who were students at the time of interview and nonstudents divided into the categories of low (0–6 years of education), low-average (7–9 years of education), high-average (10–15 years of education), and high (16+ years of education). The upper end of the low education category represents completion of primary school (6 years in KSA). The upper end of the low-average category represents completion of secondary school (3 years in KSA). And the high-average category includes high school (3 years in KSA) and the first 3 years of college. The high education category includes people who graduated from college. Family income was coded in terms of income per family member. Respondents whose value on this variable was less than 50% the median for all respondents were coded as low-income. Values up to the median were then coded as low-average, those between one and three times the median were coded as high-average, and values more than three times the median were coded as high-income. Marital status was coded either as never married, married, or previously married (either separated, divorced, or widowed).

2.3 | Analysis methods

The data were weighted to adjust for differences in within-household and between-household probabilities of selection as well as for discrepancies between sample and population distribution due to random error and differential response across segments of the population defined by census geographic and sociodemographic variables. The Part II sample was additionally weighted for the undersampling of Part I respondents who did not meet lifetime criteria for any of the mental disorders assessed in Part I. Twelve-month prevalence of treatment was then estimated in these weighted data for individual disorders within and across treatment sectors. We then examined treatment adequacy only within classes of disorder because of the sparseness of treatment data. Sociodemographic correlates of treatment and adequacy of treatment were then examined using logistic regression analysis. Standard error (SE) of treatment prevalence estimates and logits were obtained using the Taylor series linearization method (Wolter, 1985) implemented in the SUDAAN software system (Research Triangle Institute, 2002) to adjust for the geographic clustering and weighting of the sample. Logits and logits ± 2SE were exponentiated to produce odds ratios (ORs) and 95% confidence intervals (95% CIs). Multivariate significance tests of predictor sets were carried out using Wald χ^2 calculated from Taylor series design-based coefficient variance–covariance matrices. Statistical significance was evaluated consistently at the .05 level with two-sided tests.

3 | RESULTS

3.1 | Probability of 12-month treatment by disorder

Among respondents with any 12-month DSM-IV/CIDI disorder, 13.7% reported receiving some type of treatment in the 12 months before interview. (Table 1) This compares to a 2.9% treatment rate among respondents who did not meet criteria for a 12-month disorder. The small proportion of respondents who received treatment despite not meeting criteria for any DSM-IV/CIDI disorder is consistent with the results of other WMH surveys (e.g., Borges et al., 2019; Cia et al., 2019; Ishikawa et al., 2018), where further analysis typically finds that these treated noncases represent a mix of people with remitted disorders who are receiving maintenance medication (e.g., patients with a lifetime history of BPD) and a small number of cases with mostly very mild disorders that are not assessed in the WMH surveys (Bruffaerts et al., 2015; Druss et al., 2007). For now, though, we focus on treatment among respondents with disorders assessed in the SNMHS. We return to the issue of treatment among people without disorders in the discussion section.

Twelve-month treatment rates vary substantially across disorders. The highest rate is for substance use disorders (43.3%), which were considered together because the number of respondents with individual disorders in this class was too small for analysis. The next highest rates are for generalized anxiety disorder (38.4%), panic disorder (30.4%), and adult separation anxiety disorder (26.5%). The lowest rates are for agoraphobia without panic disorder (9.0%), binge-eating disorder (9.9%), and obsessive–compulsive disorder (11.6%). The median and interquartile range (IQR; defined as the 25th–75th percentiles of the distribution across disorders) of treatment rates across disorders are 15.0 and 11.6–26.5%. About half of the patients who received 12-month treatment (53.0%) were treated in the general medical sector (7.2% of all 12-month cases), about one third each in the mental health specialty (32.8%) and human services (29.8%) sectors (4.5 and 4.1%, respectively, of all 12-month cases), and 13.7% in the CAM sector (1.9% of all 12-month cases). These four proportions sum to more than 100%, indicating that some patients are treated in multiple sectors, but we do not delve into this issue in the current report.

3.2 | Variation in treatment across treatment sectors

The distribution of treatment across sectors differs substantially by disorder. (Table 2) Proportional treatment in the mental health

TABLE 1 Twelve-month treatment among respondents with DSM-IV/CIDI 12-month mental disorder in the Saudi National Mental Health Survey

| | Healthcare treatment | | | | | | Non-healthcare treatment | | | | | | Any treatment | | (n) |
| | Mental health specialty | | General medical | | Any | | Human services | | CAM | | Any | | | | |
	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	[a]
Anxiety disorder															
Panic disorder[b]	9.7	(5.2)	10.3	(5.2)	20.1	(7.2)	13.0	(6.9)	2.9	(2.9)	13.0	(6.9)	30.4	(9.4)	(46)
Agoraphobia[b]	2.0	(1.4)	6.2	(2.9)	6.7	(3.0)	0.7	(0.6)	2.5	(1.4)	3.0	(1.5)	9.0	(3.3)	(73)
Social phobia[b]	5.0	(1.8)	3.9	(1.5)	7.2	(2.0)	2.2	(1.4)	1.5	(1.2)	3.8	(1.9)	10.8	(2.7)	(130)
Generalized anxiety disorder[b]	26.1	(14.7)	11.1	(5.1)	37.2	(13.7)	20.9	(15.0)	18.5	(15.2)	21.6	(14.9)	38.4	(13.6)	(47)
Post-traumatic stress disorder[c]	2.8	(1.8)	17.6	(7.3)	18.2	(7.3)	0.0	–	0.7	(0.7)	0.7	(0.7)	18.8	(7.4)	(61)
Obsessive–compulsive disorder[c]	1.5	(1.0)	7.8	(3.2)	9.2	(3.3)	1.7	(1.2)	0.7	(0.7)	2.4	(1.4)	11.6	(3.7)	(61)
Separation anxiety disorder[c]	7.1	(5.2)	14.6	(7.6)	21.0	(8.4)	11.0	(6.0)	5.6	(5.2)	11.0	(6.0)	26.5	(8.7)	(64)
Any[c]	5.8	(1.9)	9.0	(2.8)	13.7	(3.1)	5.5	(2.1)	2.7	(1.7)	6.2	(2.1)	17.6	(3.3)	(374)
Mood disorder															
Major depressive disorder[b]	6.1	(2.8)	5.1	(1.4)	10.6	(2.8)	6.3	(2.8)	4.1	(2.8)	7.1	(2.8)	13.4	(2.9)	(251)
Bipolar I–II disorders[b]	12.5	(5.7)	3.3	(1.8)	15.8	(5.4)	10.2	(5.7)	9.0	(5.9)	12.4	(5.6)	18.9	(5.4)	(86)
Any[b]	6.0	(2.4)	5.0	(1.3)	10.6	(2.4)	5.8	(2.4)	3.9	(2.4)	6.9	(2.4)	13.3	(2.6)	(288)
Eating disorder															
Binge-eating disorder[c,d]	0.4	(0.4)	7.2	(3.3)	7.6	(3.3)	2.2	(1.9)	2.2	(1.9)	2.6	(1.9)	9.9	(3.5)	(51)
Any[b]	1.6	(0.9)	8.2	(3.2)	9.8	(3.3)	2.1	(1.3)	1.5	(1.3)	2.3	(1.4)	11.6	(3.5)	(91)
Disruptive behavior disorder															
Attention-deficit/hyperactivity disorder[c]	6.0	(2.4)	5.0	(1.3)	10.6	(2.4)	5.8	(2.4)	3.9	(2.4)	6.9	(2.4)	13.3	(2.6)	(97)
Intermittent explosive disorder[c]	3.2	(1.3)	4.2	(2.2)	6.6	(2.4)	7.2	(4.2)	1.1	(0.8)	8.4	(4.3)	15.0	(4.7)	(88)
Any[c]	1.8	(0.7)	3.8	(1.5)	5.2	(1.6)	6.0	(2.6)	0.6	(0.4)	6.6	(2.7)	11.0	(3.0)	(169)
Substance disorder															
Any substance[c]	18.0	(10.2)	17.9	(6.0)	34.9	(9.7)	19.1	(11.2)	11.9	(10.1)	20.2	(11.2)	43.3	(10.1)	(53)
Total															
Any disorder[c]	4.5	(1.2)	7.2	(1.8)	10.9	(1.9)	4.1	(1.2)	1.9	(1.0)	4.7	(1.2)	13.7	(2.0)	(656)
No disorder[c]	0.7	(0.2)	1.8	(0.7)	2.5	(0.7)	0.3	(0.1)	0.1	(0.1)	0.4	(0.1)	2.9	(0.7)	(1,325)
Total part II sample[b]	1.5	(0.3)	2.9	(0.7)	4.3	(0.7)	1.1	(0.3)	0.5	(0.2)	1.3	(0.3)	5.2	(0.7)	(1,981)

Abbreviations: CAM, complementary-alternative medicine treatment sector; CIDI, Composite International Diagnostic Interview.

[a]Number of respondents with 12-month disorder regardless of receiving treatment.

[b]Part I weight.

[c]Part II weight.

[d]Disorder with hierarchy.

specialty sector is highest for mood (45.2%) and substance use (41.5%) disorders, lower for anxiety disorders (32.9%), and much lower for disruptive behavior (16.3%) and eating (13.9%) disorders. Whereas treatment of anxiety and mood disorders is proportionally highest in the specialty mental health sectors (32.9–45.2%), it is highest in the human services sector for disruptive behavior disorders (54.5%) and substance use disorders (44.0%). And it is by far highest in the general medical sector for eating disorders (70.4%). Intermittent explosive disorder is the only disorder that is even slightly more likely to be treated in the non-healthcare sectors than the healthcare sectors (8.4 vs. 6.6%). All other disorders are more likely to be treated in the healthcare sectors than the non-healthcare sectors. In four cases these differences are substantial (i.e., greater than twice as many patients treated in the healthcare as non-healthcare sectors):

agoraphobia, obsessive–compulsive disorder, post-traumatic stress disorder, and binge-eating disorder.

Within the healthcare sectors, two disorders are substantially more likely to be treated in the mental health specialty sector than the general medical sector: generalized anxiety disorder and BPD. Another five disorders are substantially more likely to be treated in the general medical sector than the mental health specialty sector: agoraphobia, adult separation anxiety disorder, obsessive–compulsive disorder, post-traumatic stress disorder, and binge-eating disorder. Healthcare patients with the remaining disorders have roughly equal proportions treated in the mental health specialty and general medical sectors. Within the non-healthcare sectors, twice as many patients receive services from human services professionals as from the CAM sector. No disorder is more likely to be treated in the CAM sector than the human services sector.

TABLE 2 Proportional 12-month treatment across treatment sectors among respondents who obtained 12-month treatment for one or more 12-month DSM-IV/CIDI mental disorders in the Saudi National Mental Health Survey

| | Healthcare treatment | | | | | | Non-healthcare treatment | | | | | | |
| | Mental health specialty | | General medical | | Any | | Human services | | CAM | | Any | | |
	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	(n)[a]
Anxiety disorder													
Panic disorder[b]	31.9	(14.8)	34.0	(14.7)	65.9	(16.5)	42.9	(16.5)	9.6	(9.1)	42.9	(16.5)	(13)
Agoraphobia[b]	22.7	(13.6)	68.4	(15.3)	74.1	(13.9)	8.0	(6.6)	27.5	(14.8)	33.6	(15.6)	(11)
Social phobia[b]	46.2	(13.2)	36.5	(13.7)	67.2	(13.1)	20.6	(11.3)	14.3	(10.3)	34.9	(13.2)	(21)
Generalized anxiety disorder[b]	68.1	(17.8)	28.9	(16.8)	97.1	(2.5)	54.6	(23.3)	48.3	(25.6)	56.3	(22.7)	(16)
Post-traumatic stress disorder[c]	15.0	(10.1)	93.5	(5.2)	96.4	(3.8)	0.0	—	3.6	(3.8)	3.6	(3.8)	(12)
Obsessive–compulsive disorder[c]	12.7	(9.1)	66.6	(13.5)	79.3	(10.8)	14.8	(9.6)	5.8	(5.8)	20.7	(10.8)	(13)
Separation anxiety disorder[c]	26.7	(18.0)	55.1	(19.7)	79.3	(12.8)	41.7	(19.5)	21.0	(18.1)	41.7	(19.5)	(21)
Any[c]	32.9	(9.9)	51.2	(11.3)	77.8	(7.4)	31.2	(10.0)	15.1	(8.8)	35.1	(10.0)	(72)
Mood disorder													
Major depressive disorder[b]	45.3	(13.7)	37.9	(11.2)	79.1	(7.3)	47.0	(14.1)	30.3	(16.3)	52.8	(13.0)	(47)
Bipolar I–II disorders[b]	66.3	(15.6)	17.5	(10.4)	83.8	(8.9)	53.9	(18.2)	47.5	(21.0)	65.8	(14.8)	(23)
Any[b]	45.3	(12.7)	37.8	(10.4)	79.6	(6.9)	43.4	(12.6)	29.2	(14.4)	51.9	(11.3)	(54)
Eating disorder													
Binge-eating disorder[c,d]	4.0	(4.1)	73.3	(18.0)	77.3	(17.6)	22.7	(17.6)	22.3	(17.6)	26.7	(18.0)	(12)
Any[c]	13.9	(7.2)	70.4	(12.9)	84.3	(10.8)	17.8	(11.1)	12.7	(10.5)	20.1	(11.4)	(21)
Disruptive behavior disorder													
Attention-deficit/hyperactivity disorder[c]	6.8	(4.9)	35.8	(17.0)	42.5	(18.1)	62.1	(16.7)	9.1	(7.0)	71.2	(14.6)	(14)
Intermittent explosive disorder[c]	21.0	(9.5)	28.2	(13.7)	44.1	(16.0)	48.2	(17.3)	7.6	(5.3)	55.9	(16.0)	(17)
Any[c]	16.3	(6.9)	35.0	(12.3)	47.4	(13.5)	54.5	(13.2)	5.9	(4.0)	60.4	(12.4)	(25)
Substance disorder													
Any[c]	41.5	(17.9)	41.2	(16.1)	80.5	(13.2)	44.0	(18.3)	27.5	(19.3)	46.5	(17.9)	(23)
Total													
Any disorder[c]	32.8	(8.0)	53.0	(8.9)	79.7	(5.7)	29.8	(7.9)	13.7	(6.9)	34.2	(7.9)	(108)

Abbreviations: CAM, complementary-alternative medicine treatment sector; CIDI, Composite International Diagnostic Interview.
[a]Number of respondents with the 12-month disorder that reported sector of treatment.
[b]Part I weight.
[c]Part II weight.
[d]Disorder with hierarchy.

3.3 | Variation in adequacy of treatment by treatment sector and disorder class

The above results focused only on receiving *any* treatment regardless of intensity. However, even the most liberal treatment guidelines require more than a single visit to consider the treatment at least minimally adequate (i.e., at least four outpatient psychotherapy visits). Although the data are too sparse to examine treatment adequacy on a disorder-by-disorder basis, we can do so at the level of the broader disorder category (Table 3, Part I). This shows that 45.2% of all patients receive minimally adequate treatment, with higher rates among patients treated in the mental health specialty (68.9%) and CAM (68.3%) sectors than the general medical (43.5%) and human services (45.4%) sectors, although the wide SE of these estimates and the overlap in treatment across sectors (an issue considered below in Table 6) make it unwise to interpret these differences too closely. We also see variation in proportional treatment adequacy across broad classes of disorders, with by far the lowest rate of adequate treatment among patients with eating disorders (6.9%) followed by disruptive behavior disorders (25.6%) and much higher for other classes of disorder (39.7–53.3%).

It is noteworthy that the results reported in the previous paragraph are for the probabilities of treatment adequacy *among patients receiving treatment*. If we instead look at all individuals with 12-month disorders in the survey regardless of whether they received any treatment, quite a different picture emerges (Table 3, Part II). We see there that only 6.2% of individuals with a 12-month disorder received minimally adequate treatment, that this was least common among people with eating or disruptive behavior disorders (0.8–2.8%), more common among people with mood or anxiety disorders (7.1–8.0%), and most common among people with substance use disorders (17.2%), although the number of individuals with substance use disorders was so small that the latter estimate has a very large SE.

3.4 | Probability and adequacy of 12-month treatment by severity

The introduction noted that previous WMH surveys found positive associations of disorder severity with probabilities of treatment occurrence and adequacy. Although the SNMHS data are too sparse to examine these associations for individual disorders, this can be done for broader disorder categories (Table 4). The proportion of respondents receiving any treatment is higher among those with a serious disorder (20.2%) than a moderate (8.5%) or mild (10.7%) disorder. This difference is significant in the non-healthcare sector ($\chi^2_2 = 10.9$, $p = .004$), where 8.9% of serious cases and 2.6–1.0% of moderate–mild cases receive treatment. A similar but weaker pattern is seen in the mental health specialty sector ($\chi^2_2 = 3.9$, $p = .14$), where 6.8% of serious cases and 3.7–2.1% of moderate–mild cases receive treatment. However, no comparable pattern is found in the general medical sector ($\chi^2_2 = 3.3$, $p = .20$), where the proportions of serious and mild cases that receive adequate treatment are virtually identical (8.9–8.8%) and the proportion among moderate cases is lower (4.1%).

The above results regarding the association between severity and obtaining any treatment speak more to the motivation of the

TABLE 3 Adequacy of treatment in the Saudi National Mental Health Survey

	Healthcare treatment						Non-healthcare treatment							
	Mental health specialty		General medical		Any		Human services		CAM		Any		Any treatment	
	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)
I. Minimally adequate treatment among those with diagnosis who received treatment within the treatment sector														
Anxiety[a]	74.9	(11.2)	41.0	(16.6)	53.0	(11.5)	43.6	(20.2)	71.6	(22.4)	42.6	(18.4)	45.7	(10.5)
Mood[b]	77.0	(12.3)	49.2	(13.9)	64.7	(11.0)	65.2	(16.7)	76.1	(20.2)	57.4	(17.1)	53.3	(10.8)
Eating[a]	21.3	(19.5)	5.6	(3.9)	8.2	(4.7)	0.0	—	0.0	—	0.0	—	6.9	(3.9)
Disruptive behavior[a]	23.2	(15.7)	22.7	(16.5)	24.7	(13.1)	33.9	(20.7)	32.5	(28.5)	33.8	(18.9)	25.6	(12.2)
Substance[a]	87.8	(9.9)	9.9	(7.7)	47.6	(19.9)	56.7	(30.7)	100.0	(0.0)	59.0	(28.6)	39.7	(18.2)
Any disorder[a]	68.9	(10.2)	43.5	(12.7)	51.4	(9.1)	45.4	(15.9)	68.3	(20.4)	43.7	(14.3)	45.2	(8.2)
II. Minimally adequate treatment among those with a diagnosis regardless of whether they received any treatment														
Anxiety[a]	4.3	(1.8)	3.7	(2.4)	7.2	(2.9)	2.4	(1.7)	1.9	(1.6)	2.6	(1.7)	8.0	(3.0)
Mood[b]	4.6	(2.4)	2.5	(1.1)	6.9	(2.4)	3.8	(2.3)	3.0	(2.4)	4.0	(2.3)	7.1	(2.4)
Eating[a]	0.3	(0.3)	0.5	(0.3)	0.8	(0.4)	0.0	—	0.0	—	0.0	—	0.8	(0.4)
Disruptive behavior[a]	0.4	(0.3)	0.9	(0.7)	1.3	(0.8)	2.0	(1.5)	0.2	(0.2)	2.2	(1.5)	2.8	(1.6)
Substance[a]	15.8	(10.2)	1.8	(1.3)	16.6	(10.2)	10.8	(10.1)	11.9	(10.1)	11.9	(10.1)	17.2	(10.2)
Any disorder[a]	3.1	(1.1)	3.2	(1.6)	5.6	(1.8)	1.8	(1.0)	1.3	(1.0)	2.0	(1.0)	6.2	(1.8)

Abbreviation: CAM, complementary-alternative medicine treatment sector.
[a]Part II weight.
[b]Part I weight.

TABLE 4 12-month treatment and minimally adequate treatment by severity of DSM-IV/CIDI disorders in the Saudi National Mental Health Survey[a]

	Serious		Moderate		Mild		Any		Difference between serious, moderate, and mild
	%	(SE)	%	(SE)	%	(SE)	%	(SE)	χ^2_2
I. Any treatment									
General medical	8.9	(2.0)	4.1	(1.6)	8.8	(5.4)	7.2	(1.8)	3.3
Mental health specialty	6.8	(2.6)	3.7	(1.5)	2.1	(1.0)	4.5	(1.2)	3.9
Healthcare	15.0	(2.9)	6.5	(1.8)	10.6	(5.5)	10.9	(1.9)	5.0
Non-healthcare	8.9	(2.9)	2.6	(1.0)	1.0	(0.7)	4.7	(1.3)	10.9*
Any treatment	20.2	(3.3)	8.4	(2.0)	10.7	(5.5)	13.7	(2.0)	8.0*
II. Minimally adequate treatment among those with diagnosis who received any treatment									
General medical	12.5	(5.6)	21.3	(12.9)	54.2	(25.2)	23.0	(9.2)	3.4
Mental health specialty	24.7	(10.8)	30.1	(12.9)	9.1	(7.9)	22.6	(7.5)	1.7
Healthcare	36.1	(10.1)	35.6	(12.7)	60.3	(22.8)	41.0	(8.6)	0.9
Non-healthcare	22.9	(10.6)	8.0	(4.2)	0.0	—	15.0	(6.9)	525.9*
Any treatment	41.9	(9.9)	39.3	(12.5)	60.3	(22.8)	45.2	(8.3)	0.6

Abbreviation: CIDI, Composite International Diagnostic Interview.
[a]Part II weight.
*Significant at the .05 level, two-sided test.

individual to seek treatment, whereas information about the association between severity and treatment adequacy among patients in treatment speaks more to the responsiveness of the treatment system to variation in need for services among patients. It is noteworthy in this regard that probability of treatment being at least minimally adequate is not associated significantly with disorder severity either in the total sample (χ^2_2 = 0.6, p = .75) or in either or both of the healthcare sectors (χ^2_2 = 0.9–3.4, p = .64–.18). It is only in the non-healthcare sectors where a significant association is found between increased disorder severity and increased probability of treatment being adequate (χ^2_2 = 525.9, p < .001).

3.5 | Sociodemographic correlates of treatment and adequacy of treatment

The treatment data are too sparse for analysis of sociodemographic correlates in anything but highly aggregated form. We did this controlling for type and severity of disorders to predict any treatment and controlling for treatment sector in predicting adequacy of treatment. (See Appendix Table 1 for sociodemographic distributions.) The significant sociodemographic predictors of receiving any treatment among respondents with one or more 12-month disorders in this pooled model are age (χ^2_3 = 9.0, p = .029) and marital status (χ^2_2 = 8.1, p = .017). (Table 5) The age ORs are nonmonotonic, with the highest OR for the next to oldest age group. However, all three ORs for age groups younger than 50–65 years old are positive (ORs = 2.3–5.5), indicating that the treatment rate is significantly lower among individuals in the 50–65 age range than younger people. Regarding marital status, never married people have a significantly lower odds of treatment than the married (OR = 0.3, 95% CI = 0.1–0.8) and the

previously married have a nonsignificantly higher odds of treatment than the married (OR = 1.6). None of the sociodemographics, in comparison, predict treatment adequacy among people receiving treatment.

3.6 | Disorder type, treatment sector, and adequacy of treatment

As noted in the prior paragraph, we controlled for type-severity of disorders in examining the associations of sociodemographics with 12-month treatment. Disorder severity was found not to be a significant predictor either of receiving any treatment (χ^2_2 = 0.6, p = .75) or of treatment adequacy among those who received treatment (χ^2_2 = 0.5, p = .79). (Table 6) However, odds of receiving any treatment are significantly elevated among respondents with several disorders, including panic disorder (OR = 7.3, 95% CI = 2.2–23.7), generalized anxiety disorder (OR = 5.1, 95% CI = 1.7–15.5), adult separation anxiety disorder (OR = 3.3, 95% CI = 1.3–8.2), and substance use disorder (OR = 6.6, 95% CI = 2.9–15.2, noting that the composite for any substance use disorder was used because individual substance use disorders are too uncommon to be examined separately).

In predicting adequacy of treatment among patients who received any treatment, we had to collapse disorders into classes because of the small overall sample size. Only eating disorders were significant in that model (OR = 0.1, 95% CI = 0.0–0.7). We also included indicators of treatment sector, but the data were so sparse that the only measure of that could be used was a dummy for treatment being received in multiple sectors, which is associated with a very unstable but significantly elevated relative odds of treatment being adequate (OR = 86.9, 95% CI = 18.9–400.0).

TABLE 5 Associations with treatment among those with any 12-month DSM-IV/CIDI mental disorder (weighted n = 401) in the Saudi National Mental Health Survey[a]

	Any treatment		Minimally adequate treatment	
	OR	(95% CI)	OR	(95% CI)
Age[b]				
15–24	2.3	(0.6–9.5)	0.8	(0.0–22.8)
25–34	2.3	(0.7–8.0)	1.8	(0.1–29.4)
35–49	5.5*	(1.6–19.5)	6.3	(0.4–89.4)
50+	1.0	Ref	1.0	Ref
χ^2_3	9.0*		6.5	
Gender				
Female	1.0	Ref	1.0	Ref
Male	1.9	(0.9–4.2)	1.1	(0.3–3.4)
χ^2_1	2.6		1.2	
Education[b]				
Student	1.2	(0.3–4.9)	1.7	(0.2–18.0)
Low	1.4	(0.4–5.7)	0.7	(0.1–8.6)
Low-average	1.4	(0.4–4.4)	1.7	(0.3–8.6)
High-average	0.9	(0.4–2.0)	0.3	(0.1–1.4)
High	1.0	Ref	1.0	Ref
χ^2_4	1.7		6.8	
Income[b]				
Low	1.4	(0.5–4.1)	1.5	(0.3–7.1)
Low-average	1.0	(0.4–2.7)	1.5	(0.3–7.3)
High-average	1.2	(0.4–3.6)	0.6	(0.1–5.0)
High	1.0	Ref	1.0	Ref
χ^2_3	0.6		3.8	
Marital status[b]				
Previously married	1.6	(0.5–4.6)	0.4	(0.1–1.3)
Never married	0.3*	(0.1–0.8)	0.8	(0.2–3.3)
Currently married	1.0	Ref	1.0	Ref
χ^2_2	8.1*		3.0	

Abbreviations: CI, confidence interval; CIDI, Composite International Diagnostic Interview; OR, odds ratio.

[a]The models were estimated in the Part II sample. The model for any treatment was estimated among respondents with one or more 12-month disorders controlling for severity of disorders and 13 dummy variables for the individual types of disorders. The model for treatment adequacy was estimated in the subsample of respondents with any treatment controlling for number of treatment sectors in which treatment was received, severity of disorder, and five dummy variables for the broad disorder classes. The latter was necessary because the sample was too small to allow coefficients to be estimated for the individual disorders.

[b]Variables defined at the age of interview.

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

4 | DISCUSSION

As noted in other papers in this issue, incomplete coverage and assessment in the SNMHS are likely to have resulted in underestimation of disorder prevalence (Al-Subaie et al., 2020; Altwaijri, Al-Habeeb, et al., 2020; Altwaijri, Al-Subaie, et al., 2020). Such problems are inevitable in epidemiological surveys, although they were kept to a minimum by our efforts to maximize response rates and accuracy of reporting. It is important to note that these residual problems are likely to result in an *overestimation* of the proportion

of cases receiving treatment, people receiving treatment are presumably more likely to report these disorders to interviewers. It is striking in light of this fact that the treatment rates estimated in the SNMHS are well below the lower end of the range of estimates across WMH surveys in other high-income countries (Borges et al., 2019; Cia et al., 2019; Wang et al., 2007; Whiteford et al., 2014). For example, the 20.2% of SNMHS respondents with a serious 12-month disorder who received treatment in the 12 months before the survey compares to a median of about 50% across other WMH surveys in high-income countries and a range

	Any treatment		Minimally adequate treatment	
	OR	(95% CI)	OR	(95% CI)
Severity				
Serious	0.9	(0.3–3.2)	0.7	(0.1–4.2)
Moderate	0.7	(0.3–1.9)	0.3	(0.1–1.5)
Mild	1.0	Ref	1.0	Ref
χ^2_2	0.6		0.48	
Number of sectors				
2+			86.9*	(18.9-400.0)
Anxiety disorder				
Panic disorder	7.3*	(2.2–23.7)	—	
Agoraphobia	0.8	(0.3–2.1)	—	
Social phobia	1.6	(0.8–3.4)	—	
Generalized anxiety disorder	5.1*	(1.7–15.5)	—	
Post-traumatic stress disorder	1.0	(0.5–2.2)	—	
Obsessive–compulsive disorder	1.3	(0.6–3.0)	—	
Separation anxiety disorder	3.3*	(1.3–8.2)	—	
Any	—		1.9	(0.6–5.7)
χ^2_7	23.0*			
Mood disorder				
Major depressive disorder	0.8	(0.4–1.5)	—	
Bipolar I–II disorders	1.7	(0.7–4.2)	—	
Any	—		1.2	(0.4–3.6)
χ^2_2	1.6			
Eating disorder				
Binge-eating disorder	0.8	(0.3–2.1)		
Any	—		0.1*	(0.0-0.7)
Disruptive disorder				
Attention-deficit/hyperactivity disorder	0.5	(0.2–1.4)	—	
Intermittent explosive disorder	1.3	(0.6–3.1)	—	
Any	—		0.5	(0.1–2.0)
χ^2_2	1.9			
Substance disorder				
Any	6.6*	(2.9–15.2)	2.2	(0.5–9.1)
$\chi^2_{28/20}$	127.0*		92.5*	

TABLE 6 Associations of disorder severity and type with any 12-month treatment and adequacy of treatment among respondents with one or more 12-month DSM-IV/CIDI mental disorders in the Saudi National Mental Health Survey[a]

Abbreviations: CI, confidence interval; CIDI, Composite International Diagnostic Interview; OR, odds ratio.
[a]Part II sample.
*Significant at the .05 level, two-sided test.

between 62.1% in Belgium (Bruffaerts, Bonnewyn, Van Oyen, Demarest, & Demyttenaere, 2004) and a low of 24.2% in Japan (Nishi, Ishikawa, & Kawakami, 2019). This very low treatment rate in Saudi Arabia compared to other high-income countries exists across all treatment sectors and disorders and all levels of disorder severity. Treatment adequacy among those who received treatment, in comparison, is broadly comparable to that found among people in treatment in WMH surveys in other high-income countries, although the definition of minimally adequate treatment was somewhat different in earlier WMH surveys.

How do we reconcile this evidence of low treatment with the fact that KSA spends a considerably higher proportion of its healthcare budget on mental disorders than the worldwide average? An obvious answer is that low demand is the key issue rather than low access to care. However, before dismissing access as a problem, it needs to be noted that the 4.7% of the Saudi GDP invested in healthcare is well below the 8.7% median (range: 7.5–13.9%) spent by the other high-income countries that carried out WMH surveys (Wang et al., 2008). Furthermore, the roughly 4% of total healthcare spending devoted to mental disorders in KSA, while above the worldwide average of less

than 2%, is at the low end of the range for high-income countries, where the median is about 6%, the range about 2–11%, and the IQR about 4–8% (World Health Organization, 2018).

An overly simplistic view of our results might go back to our finding of a 2.9% treatment rate among the 80% of survey respondents who did not meet criteria for any of the disorders assessed. This 2.9 of 80% equals 2.3% of the population, which is nearly as large as the 2.7% of the population represented by the 13.7 of the 20% of survey respondents who met criteria for one or more of these disorders. However, the suspicion based on this observation that a relatively high proportion of mental health services in KSA goes to people without apparent need is inconsistent with considerable evidence based on research carried out in other WMH surveys. In particular, this prior analysis shows that the vast majority of the people without 12-month disorders who received 12-month treatment either had lifetime disorders that were being managed with maintenance medication or had other indicators of need, such as multiple subthreshold disorders or recent stressors (e.g., most often death of a loved one or marital disruption) that were being addressed through psychological counseling (Bruffaerts et al., 2015; Druss et al., 2007). Preliminary analysis of the SNMHS data suggests that very similar patterns exist in KSA, although a more thorough investigation of this issue will be needed in a future report.

The general medical sector is the largest source of mental health service delivery in most countries (Cia et al., 2019; Wang et al., 2008) and the same was found to be true in the SNMHS. However, the roughly 50% (7.2%/13.7%) of all treated cases reported in the SNMHS to be seen in the general medical sector is well below 70–80% found in a number of other high-income countries (e.g., Belgium, France, Italy, the Netherlands, New Zealand), although similar to the proportions found in other high-income countries (e.g., Germany, Japan, United States) (Wang et al., 2008). In other WMH surveys where proportional treatment in the general medical sector is comparatively low, we find consistently that proportional treatment in the mental health specialty sector is comparatively high. In other words, higher proportions of people seeking treatment in those countries than in others seek treatment directly from mental health professionals rather than going first to primary care physicians. This is not the case, though, in the SNMHS, where the 33% of all treated cases seen in the mental health specialty sector (4.5%/13.7% = 33%) is below the median (IQR) of 48.5% (47.1–50.5%) in WMH surveys in other high-income countries. Instead, it is the human services sector that has an inordinately elevated proportional treatment rate in the SNMHS: 30% (4.1%/13.7%) compared to a median (IQR) of 10.3% (3.7–15.0%) in WMH surveys in other high-income countries (Cia et al., 2019; Wang et al., 2008).

More detailed review of survey data not reported in the tables showed that the high rate of human services treatment in KSA consists largely of treatment by religious advisors (*Shaykhs*) or faith healers. This is challenging because these kind of service providers usually do not receive training in mental health counseling and lack access to or affiliation with healthcare systems (Kovess-Masfety et al., 2017). It raises a question whether opportunities might exist for

mental health professionals in KSA to work with religious professionals to facilitate referrals of individuals who would be helped more by treatment in the healthcare sector than in the human services sector. This issue has been pointed to as a promising direction for investigation in Western counties (Kazdin, 2019).

The finding that proportional human service sector treatment is especially high among patients with disruptive behavior disorders is not surprising given that many countries consider these disorders matters to be dealt with by the criminal justice system rather than the healthcare system. The same is true for substance use. Previous research in another Islamic country showed that this led many people with substance use disorders to seek treatment from traditional healers (Al Wahaibi et al., 2019). This is consistent with CAM use being comparatively high for substance use disorders in the SNMHS. It is unclear, though, why we find high proportional CAM use in the SNMHS for generalized anxiety disorder and BPD. The 14% overall proportional CAM use in the SNMHS (1.9%/13.7%), though, is similar to the proportions found in such other high-income countries as the Netherlands (13.5%), the United States (15.6%), and New Zealand (19.0%).

WMH surveys in other high-income countries generally find that the probability of receiving any treatment, the probability of that treatment being in the mental health specialty sector, and the probability of the treatment meeting established standards of adequacy all increase with disorder severity (Cia et al., 2019; Wang et al., 2008). But not all these patterns are found in the SNMHS. Proportional treatment of any type is higher among cases rated serious than moderate in all WMH surveys in high-income countries, with a median (IQR) treatment ratio of 1.6 (1.4–2.0). The comparable ratios for serious versus mild cases are 2.9 (2.1–3.4). These ratios are 2.4 and 1.9 in the SNMHS. These results show that people with serious disorders in Saudi Arabia are broadly comparable to those in other high-income countries in being more likely to seek treatment than people with less severe disorders.

The situation is different, though, for proportional treatment in the mental health specialty sector among treated respondents with serious versus moderate disorders. This ratio has a median (IQR) across WMH surveys in other high-income countries of 1.2 (0.8–1.5) compared to 0.8 in the SNMHS. This means that the tendency for more serious cases to be treated in the mental health specialty sector is not as pronounced in Saudi Arabia as in other high-income countries. This could be due to a lower tendency of other treatment providers to refer serious cases to mental health specialists, a lower tendency of more serious cases to seek treatment directly from mental health specialists, or both. These differences can be teased apart in the SNMHS data but it is beyond the scope of this first paper on recent treatment. The proportion of treated cases that received treatment that was at least minimally adequate among respondents with serious versus moderate disorders has a median (IQR) across WMH surveys in other high-income countries of 1.3 (1.1–1.6). The ratio in the SNMHS is 1.1, which is at the low end of the IQR of other high-income countries that carried out WMH surveys.

In considering reasons so many people with 12-month disorders in the SNMHS reported that they did not seek any treatment, it is noteworthy that we failed to find the higher treatment rate among women than men that is seen consistently in other WMH surveys (Borges et al., 2019; Cia et al., 2019; Ishikawa et al., 2018; Wang et al., 2008). However, marital status, among sociodemographic correlates of treatment found consistently in other WMH surveys, was found in the SNMHS, with the lowest treatment rate among the never married and the highest among the previously married. We plan to investigate the issue of reasons for not seeking treatment more directly in a future report that analyzes responses to questions asked of SNMHS respondents with 12-month mental disorders who did not seek treatment about their reasons for not seeking treatment. Prior WMH surveys found that by far the most common responses to questions about reasons for not seeking treatment involve perceived lack of need (Andrade et al., 2014; Mojtabai et al., 2011), although this response is inversely related to disorder severity. Among those who recognize a need for treatment, in comparison, attitudinal barriers dominate for mild–moderate cases and structural barriers for more severe cases. A preliminary investigation of the SNMHS data suggests that similar distributions of reasons for not seeking treatment exist in KSA, but a detailed analysis of these reports will have to await a future paper.

The results reported in this article and others that wait to be teased from the SNMHS data have implications of several sorts. First, our finding that a low percentage of individuals with 12-month mental disorders in KSA receive any treatment documents the high level of unmet need for treatment of mental disorders in the country, as suggested without adequate empirical support by previous commentators (e.g., Alamri, 2016; Almutairi, 2015). Alleviating this problem will require expansion of treatment resources and outreach efforts to attract individuals with mental disorders into treatment. Community education to increase mental health literacy and reduce stigma and screening programs in primary care are commonly used strategies shown to be effective in reducing barriers to treatment of mental disorders (Xu et al., 2018). But it is important to make sure that quality of care is adequate before such programs are initiated. For example, concerns about inadequate quality of treatment resulted in the 2009 recommendation of the U.S. Preventive Services Task Force against routine screening for depression in primary care (U.S. Preventive Services Task Force, 2009). That recommendation was subsequently reversed after it was determined that the quality of primary care treatment of depression had improved sufficiently to make routine screening cost-effective (O'Connor, Rossom, Henninger, Groom, & Burda, 2016). A similar order of operations is needed in expanding treatment for common mental disorders in KSA. And the SNMHS data provide important clues about how this might be done that have not yet been investigated.

Second, there will be a need to devise rational treatment allocation rules if any new initiatives to increase treatment lead to demand increasing faster than supply of services. For example, decisions would need to be made in such a case whether to focus resources on those with the greatest needs versus larger numbers with milder disorders (e.g., to prevent negative sequelae), to deliver services through primary care versus specialty sectors or inpatient versus community settings, and whether to provide mental health services on parity with those for general medical disorders (Mihalopoulos, Carter, Pirkis, & Vos, 2013; Saxena, Funk, & Chisholm, 2015). Ideally these questions would be answered through formal analyses of the burdens from illnesses and the cost-effectiveness of treatments (Luyten, Naci, & Knapp, 2016), but this would require access to rigorous data to compare disease burdens and weigh the costs and benefits of different regimens. Interim decisions can be made in the absence of such data, but rationality in decision-making requires that such data be collected to help inform decision-making. The descriptive data presented here is a good beginning but can be expanded greatly in future analyses of the SNMHS that look at the responses to questions not yet analyzed regarding the effects of mental disorders on work role functioning. This information can be combined with data on the societal costs of untreated mental disorders to create a full portrait of the magnitude of unmet need (Alonso et al., 2013).

Third, review and pilot implementation of proven strategies for improving population mental health through prevention, early intervention, and long-term treatment of chronic cases will be needed to determine the cost-effectiveness of specific interventions (Patel et al., 2016). As yet unanalyzed data contained in the SNMHS can be helpful to policymakers in selecting among these intervention options. Specific strategies to achieve their desired goals will then need to be selected. Some of the techniques used in managed care, such as gate-keeping, utilization review, and prior approval, might be used to reduce unnecessary use but optimize appropriate use of services as these interventions are implemented, but these need to be evaluated to determine an optimal mix in the context of the specific circumstances of Saudi society. And then future tracking efforts, such as replications of the SNMHS and monitoring of administrative trend data, could be used to shed light on the impacts of policies and delivery systems in ways that help policymakers monitor and modify policies in the service of achieving their desired goals.

publications can be found at http://www.hcp.med.harvard.edu/wmh. We also acknowledge with gratitude the work and dedication of the SNMHS staff both current and past for their contributions to the study.

DECLARATION OF INTEREST STATEMENT

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.