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Twelve-month prevalence and severity of mental disorders in the Saudi National Mental Health Survey

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Abstract

Objectives: To estimate 12-month prevalence and severity of 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 aged 15 to 65 in the Kingdom of Saudi Arabia (KSA) (n = 4,004). The World Health Organization (WHO) Composite International Diagnostic Interview (CIDI) was used to estimate 12-month prevalence of common DSM-IV mental disorders.

Results: Twelve-month prevalence of any DSM-IV/CIDI disorder is 20.2%. Most common are anxiety disorders (12.3%) followed by mood (6.8%), disruptive behavior (5.4%), eating (3.2%), and substance use (1.9%) disorders. The proportion of 12-month cases rated serious (39.0% of all cases) is high across virtually all disorders relative to the proportions found in CIDI surveys in other high-income countries. Younger people have significantly elevated odds of mood and disruptive behavior disorders and serious disorders. Women have significantly elevated odds of anxiety and mood disorders and serious disorders. Previously married people have significantly elevated odds of most disorder classes and serious disorders.

Conclusions: Both 12-month prevalence and severity of DSM-IV/CIDI disorders are high in Saudi Arabia compared to other high-income countries that carried out comparable surveys.

KEYWORDS

epidemiology, mental disorders, prevalence, Saudi National Mental Health Survey (SNMHS), WHO World Mental Health (WMH) Survey Initiative

1 | INTRODUCTION

General population surveys from the World Health Organization (WHO) World Mental Health (WMH) Surveys Initiative across the globe estimate that up to one-fourth of people in the adult population of many countries experience a mental disorder at some time in any given year but that only a small minority of these people receive any treatment for these disorders within the year (Alonso et al., 2018; Degenhardt et al., 2017; Thornicroft et al., 2017). As would be expected, treatment is more likely for the more severe cases, but a large treatment gap nonetheless exists even for serious cases. However, there are wide variations in cross national patterns, which means that it is important not to assume that the average results across countries, even countries in the same region of the world, apply to any individual country.

Until now, no nationally representative community survey of mental disorder prevalence and treatment was carried out in the Kingdom of Saudi Arabia (KSA). Survey data of this sort are important for public health policy and planning purposes. The Global Burden of Disease (GBD) Study 2015 generated synthetic estimates of mental disorder burden in each country of the Eastern Mediterranean region for 1990–2015 by combining data across 108 epidemiological studies that had been carried out in the region during the time interval (GBD 2015 Eastern Mediterranean Region Mental Health Collaborators, 2018). These estimates suggested that drug use disorders, depressive disorders, and anxiety disorders are the third, fourth, and sixth leading causes of disability in KSA (Institute for Health Metrics and Evaluation, 2019). Yet none of the surveys on which these estimates were made were carried out in KSA. More direct estimates are needed for policy planning purposes.

The Saudi National Mental Health Survey (SNMHS) was launched to provide these direct estimates. The SNMHS is a nationally representative household survey of the prevalence and correlates of common mental disorders in KSA. It is carried out as part of the WHO WMH Survey Initiative (Alonso, Chatterji, & He, 2013; Kessler & Üstün, 2008; Scott, de Jonge, Stein, & Kessler, 2018). Standardized WMH methods were used in SNMHS field implementation to provide valid data on the prevalence and distribution of mental disorders and unmet need for treatment of these disorders (Harkness et al., 2008; Heeringa et al., 2008; Pennell et al., 2008). Prior to the SNMHS, 12-month prevalence data were available for only a few countries in the Arab world, most notably WMH surveys in Iraq (Alhasnawi et al., 2009) and Lebanon (Karam et al., 2006), and the only relevant 12-month prevalence data from the Gulf Cooperation Council (GCC) states were for adolescents attending school in Oman (Jaju, Al-Adawi, Al-Kharusi, Morsi, & Al-Riyami, 2009) and reports about individual disorders in Saudi regional samples (e.g., Al-Gelban, 2007; Raheel, 2015).

Little agreement exists among psychiatric epidemiologists on the best time frame to use in reporting data from community epidemiological surveys on the recent prevalence of mental disorders. It is widely agreed that a focus on recent prevalence avoids the biases associated with selective recall that can occur when assessing lifetime prevalence retrospectively, but in some studies, this is done by estimating current prevalence at the time of interview (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Jenkins et al., 2003), whereas others report prevalence in the 6 months (Marcks, Weisberg, Dyck, & Keller, 2011; Park et al., 2011) or 12 months (Andrade et al., 2012; McEvoy, Grove, & Slade, 2011) before interview. We prefer to focus on 12-month prevalence for three reasons. First, prevalence might be underestimated for shorter recall periods due to people currently in episodes being less likely than others to agree to participate in a survey. Second, the diagnostic criteria for some disorders comprise not only current symptoms but also symptoms that date back many months or even years, making it impossible to make diagnoses based exclusively on data about current symptoms. For example, information about the lifetime occurrence of hypomania or mania is required to determine whether a current major depressive episode is a major depressive disorder or a depressive phase of a bipolar I-II disorder (BPD). A diagnosis of generalized anxiety disorders requires an assessment of symptoms over a 6-month time period. Third, most policy planning decisions are made on an annual basis (Wittchen et al., 2011).

It would also be of interest to have information on the distributions of severity of 12-month cases (e.g., the proportion of major depressive episodes occurring in the past 12 months that were serious). The aims of the current report are to present estimates of this sort for the 12-month prevalence and 12-month persistence among lifetime cases of common mental disorders in KSA along with basic socio-demographic correlates for these estimates.

2 | METHODS

2.1 | Sample

As detailed elsewhere in this issue (Mneimneh, Heeringa, & Lin, Altwaijri, & Nishimura, 2020), the SNMHS was based on a nationally representative multistage clustered area probability household sampling design that focused on citizens aged 15–65 living in KSA exclusive of the two administrative areas involved in political conflict at the time of the survey (Jazan & Najran). A stratified multistage clustered area probability sample of 4,302 households was selected as the first-stage sampling units in the remaining 11 administrative areas of the country. The household screening rate was 84% and the conditional interview response rate in screened households was 73%, for an estimated individual-level response rate of 61% using the American Association of Public Opinion Research RR2 definition (American Association for Public Opinion Research,2016). (The individual-level 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.) A total of 4,004 interviews were completed. 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. All interviews were conducted face-to-face by trained lay interviewers.

As in other WMH surveys, we used a two-partcase–control sampling design 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 socio-demographic 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

Diagnoses were 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 to generate diagnoses based on both ICD-10(World Health Organization, 1991) and DSM-IV(American Psychiatric Association, 2000) diagnostic criteria. DSM-IV criteria are used here to facilitate comparisons with the results of previous WMH epidemiological surveys.

Diagnoses based on the CIDI have been shown to have good concordance with diagnoses based on blinded clinician reappraisal 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 based on a new clinical reappraisal study described in another paper in this issue (Kessler et al., In press): 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.

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, 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). Organic exclusion rules and hierarchy rules were used to make all diagnoses other than the diagnoses of substance use disorders. The latter were diagnosed without hierarchy in recognition that abuse often is a stage in the progression to dependence. However, we also coded disorders so that they could be analyzed without using diagnostic hierarchy rules for purposes of studying various types of comorbidity that are of special interest.

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 *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 the past 12 months in conjunction with the disorder; or (c) the respondent reported severe impairment in at least two of the four areas of role functioning, we assessed with a modified version of the Sheehan Disability Scale (SDS; Sheehan, Harnett-Sheehan, & Raj, 1996; 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 | Socio-demographic correlates

The socio-demographic 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 as total family income from all sources divided by the number of family members in the household. Respondents whose value on this variable was less than 50% of the median in the entire sample were coded *low-income*. Values up to the median were then coded *low-average*, those between one and three times the median were coded *high-average*, and values more than three times the median were coded *high-income*. Marital status was coded either 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 socio-demographic and geographic distributions due to random error and differential response across segments of the population defined by census variables known for the population. The Part II sample was additionally weighted for the undersampling of Part I respondents without core disorders. Twelve-month prevalence was then estimated in these weighted data for individual disorders and classes of disorders.

Socio-demographic correlates of 12-month prevalence and persistence were examined using logistic regression. The models for prevalence were estimated in the total sample. The models for persistence, in comparison, had to be estimated indirectly because we did not have access to longitudinal data. This was done by focusing on the subsamples of respondents with the outcome disorders and predicting 12-month prevalence controlling for time-since-onset(-TSO), where TSO was defined as the difference between age-at-interview and at-of-onset(AOO). AOO was not included in the model because age at interview was one of the predictors and AOO is perfectly defined by age at interview minus TSO. We estimated separate multivariate models to predict 12-month prevalence and 12-month persistence of each disorder assessed in the SNMHS along with parallel models to predict prevalence and persistence of at least one disorder in each of the five broad categories (i.e., anxiety, mood, eating, disruptive behavior, and substance use disorders) and any disorder in any category. The models for persistence within categories and for any disorder controlled for TSO of the disorder with the most recent AOO in the category as well as for total number of lifetime disorders in the category.

We also examined the socio-demographic predictors of 12-month disorder severity. This was done separately in the total sample and in the successively smaller subsamples of respondents with lifetime disorders and 12-month disorders. This series of models was estimated in parallel in order to tease apart the extent to which the significant associations of the socio-demographics with serious 12-month disorders were due to associations of these same predictors with lifetime disorders, persistence of lifetime disorders into the past 12 months, and severity among 12-month cases.

Standard errors of estimates of prevalence, persistence, and the logits in the prediction models were obtained using the Taylor series linearization method (Wolter, 1985) implemented in the SUDAAN software system (Research Triangle Institute, 2002). Logits and logits ±2 standard errors were exponentiated to produce odds-ratios(ORs) and 95% confidence intervals (95% CIs). Multivariate significance tests of predictor sets were made with Wald χ^2 tests using 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 | Twelve-month prevalence and persistence

Twelve-month prevalence of any DSM-IV/CIDI disorder in the SNMHS is 20.2%. As with lifetime prevalence, anxiety disorders are by far the most common class of disorders (12.3%, which represents about 60% of all people with any 12-month mental disorder) followed by mood disorders (6.8%, about one-third of all people with any 12-month disorder) and disruptive behavior disorders (5.4%, which represents about one-fourth of all people with any 12-month disorder). Least common are eating disorders (3.2%, about one-sixth of all people with any 12-month disorder) and substance use disorders (1.9%, about one-tenth of all people with any 12-month disorder). About 40% of respondents with a 12-month disorder meet criteria for 2 or more such disorders, including about 25% with exactly 2 and 15% with 3+ 12-month disorders.

The most common individual disorders are social phobia (SoP; 4.2%), major depressive disorder (MDD; 3.8%), separation anxiety disorder (SAD; 3.7%), and attention-deficit/hyperactivity disorder (ADHD; 3.2%). Most other disorders have much lower 12-month prevalence than these four most common disorders. The only other disorders with 12-month prevalence greater than 2.0% are BPD (3.0%), bulimia nervosa (2.1%), and intermittent explosive disorder (2.7%).

The four disorders with highest 12-month prevalence are also the most common lifetime disorders, but the rank ordering is different, with SAD and ADHD the two most common lifetime disorders (11.9 and 8.0%, respectively), followed by MDD (6.0%) and SoP (5.6%). These changes in relative ranking between lifetime and 12-month prevalence reflect the fact that SAD and ADHD, which typically begin to emerge in childhood (de Girolamo, Dagani, Purcell, Cocchi, & McGorry, 2012), often remit in adulthood (Fayyad et al., 2017; Silove et al., 2015). These differences are reflected in the SNMHS data by

the finding in our earlier lifetime prevalence paper that the 25th–50th percentiles of the age-of-onset(AOO) distributions of ADHD (ages 8–11) and SAD (ages 8–13) are earlier than those of SoP (11–14) and MDD (17–20) (Altwaijri et al., 2020). Another relevant comparison is reported in Table 1, where we record the ratio of 12-month prevalence to the lifetime prevalence estimates reported in our earlier paper. We see there that these ratios, which can be interpreted as indirect indicators of disorder persistence, are much lower for SAD (30.7%) and ADHD (40.0%) than for SoP (74.2%) or MDD (63.6%).

By far, the highest persistence is for BPD (90.7%). However, either a 12-month depressive episode or a 12-month episode of mania or hypomania is counted as evidence of persistence, which means that there are two times as many ways to be defined as persistent for BPD as the other disorders. The next highest 12-month persistence is for panic disorder (82.6%) and intermittent explosive disorder (81.7%), which are both characterized by the occurrence of uncontrollable attacks of either fear or anger, and phobias (80.0% for agoraphobia and 74.2% for social phobia), which often occur in conjunction with triggered panic attacks. In terms of disorder classes, 12-month persistence is highest for mood disorders (73.3%) because of the very high persistence of BPD and relatively high persistence of MDD (63.6%). Lower and relatively comparable rates of persistence are found for anxiety (52.9%), eating (51.8%), disruptive behavior (48.4%), and substance use (48.6%) disorders.

TABLE 1 12-month prevalence and persistence of DSM-IV/CIDI disorders in the Saudi National Mental Health Survey

	Prevalence		Persistence		
	%	(SE)	%	(SE)	(n)
Anxiety disorder					
Panic disorder[a]	1.3	(0.3)	82.6	(5.2)	(46)
Agoraphobia[a]	1.8	(0.3)	80.0	(6.6)	(75)
Social phobia[a]	4.2	(0.5)	74.2	(3.7)	(130)
Generalized anxiety disorder[a,b]	0.9	(0.2)	48.2	(10.2)	(34)
Post-traumatic stress disorder[c]	1.8	(0.3)	53.7	(6.0)	(61)
Obsessive–compulsive disorder[c]	1.8	(0.3)	43.1	(5.9)	(64)
Separation anxiety disorder[c]	3.7	(0.6)	30.7	(4.1)	(99)
Any[c]	12.3	(1.0)	52.9	(3.5)	(367)
Mood disorder					
Major depressive disorder[a,b]	3.8	(0.4)	63.6	(3.5)	(158)
Bipolar I–II disorders[a]	3.0	(0.5)	90.7	(4.4)	(86)
Any[a]	6.8	(0.7)	73.3	(3.1)	(244)
Eating disorder					
Anorexia nervosa[c]	0.0	(0.0)	-	(0)	
Bulimia nervosa[c]	2.1	(0.4)	66.0	(6.6)	(51)
Binge-eating disorder[b,c]	1.0	(0.3)	36.0	(8.8)	(40)
Any[c]	3.2	(0.5)	51.8	(6.6)	(91)
Disruptive behavior disorder					
Conduct disorder[c]	0.3	(0.1)	18.0	(6.6)	(10)
Attention-deficit/hyperactivity disorder[c]	3.2	(0.5)	40.0	(5.3)	(97)
Intermittent explosive disorder[b,c]	2.7	(0.6)	81.7	(6.1)	(72)
Any[c]	5.4	(0.6)	48.4	(4.6)	(158)
Substance disorder					
Alcohol abuse[c]	0.2	(0.1)	32.5	(16.7)	(7)
Drug abuse[c]	1.4	(0.4)	43.1	(9.9)	(40)
Drug dependence[c]	0.5	(0.1)	55.9	(11.3)	(15)
Any[c]	1.9	(0.4)	46.6	(7.1)	(53)
Total					
Any disorder[c]	20.2	(1.3)	59.1	(3.0)	(639)

Note: Part I sample n = 4,004, Part II sample n = 1,981. 12-month persistence estimates were not reported for disorders (the denominator) with n < 20 lifetime cases.

Abbreviations: CIDI, Composite International Diagnostic Interview; SE, Standard Error.

[a]Part I sample, prevalence calculated using Part I weights.

[b]Disorders with hierarchy.

[c]Part II sample, prevalence calculated using Part II weights.

3.2 | Disorder severity

Most Saudis with 12-month mental disorders are classified as having either a serious disorder (7.9% of all respondents, which represents 39.0% of people with 12-month disorders) or a moderate disorder (6.8% of all respondents, 33.7% of people with 12-month disorders) using the standard WMH severity classification system (Table 2). Mood disorders are most likely to be rated serious (62.4%) followed by substance use disorders (55.9%), anxiety disorders (43.9%), and disruptive behavior disorders (41.6%). Eating disorders are by far least likely to be rated serious (29.7%). The individual disorders most likely to be rated serious are drug dependence (91.5%) and BPD (82.6%), both of which are rated serious definitionally in some cases (with symptom of physiological dependence in the case of drug dependence

TABLE 2 Severity of 12-month DSM-IV/CIDI disorders in the total sample and among respondents with particular disorders in the Saudi National Mental Health Survey

	Severity[a]						
	Serious		Moderate		Mild		
	%	(SE)	%	(SE)	%	(SE)	(n)
Anxiety disorders							
Panic disorder[b]	61.7	(9.4)	29.4	(8.9)	8.9	(5.1)	(46)
Agoraphobia[b]	47.7	(8.3)	40.4	(9.1)	11.8	(4.9)	(75)
Social phobia[b]	43.3	(6.1)	48.9	(6.2)	7.8	(3.5)	(130)
Generalized anxiety disorder[b,c]	68.3	(11.4)	12.6	(6.5)	19.1	(8.8)	(34)
Post-traumatic stress disorder[d]	48.2	(10.3)	26.9	(7.5)	24.9	(11.1)	(61)
Obsessive–compulsive disorder[d]	41.4	(9.8)	46.4	(10.1)	12.2	(5.6)	(64)
Separation anxiety disorder[d]	52.3	(7.5)	25.8	(6.1)	21.9	(8.7)	(99)
Any[d]	43.9	(3.7)	38.8	(4.4)	17.3	(3.7)	(367)
Mood disorders							
Major depressive disorder[b,c]	47.3	(5.8)	42.2	(6.1)	10.5	(4.2)	(158)
Bipolar I–II disorders[b]	82.6	(7.7)	16.7	(7.7)	0.7	(0.7)	(86)
Any[b]	62.4	(4.7)	31.4	(4.6)	6.3	(2.6)	(244)
Eating disorders							
Anorexia nervosa[d]	-			-	(0)		
Bulimia nervosa[d]	23.2	(6.9)	27.3	(11.4)	49.5	(10.4)	(51)
Binge-eating disorder[c,d]	32.9	(9.3)	7.9	(3.7)	59.2	(9.6)	(40)
Any[d]	29.7	(6.8)	14.3	(5.0)	56.0	(7.5)	(91)
Disruptive behavior disorders							
Conduct disorder[d]	38.0	(18.8)	19.4	(11.4)	42.6	(19.5)	(10)
Attention-deficit/hyperactivity disorder[d]	37.9	(6.5)	21.7	(8.1)	40.5	(7.9)	(97)
Intermittent explosive disorder[c,d]	47.2	(9.7)	47.0	(9.7)	5.8	(2.9)	(72)
Any[d]	41.6	(6.0)	29.4	(6.8)	29.0	(6.3)	(158)
Substance disorders							
Alcohol abuse[d]	66.1	(24.8)	33.9	(24.8)	0.0	-	(7)
Drug abuse[d]	47.0	(13.0)	34.0	(13.6)	19.0	(8.7)	(40)
Drug dependence[d]	91.5	(8.4)	8.5	(8.4)	0.0	-	(15)
Any[d]	55.9	(10.1)	29.6	(11.5)	14.4	(5.7)	(53)
Total							
Any disorder[d]	39.0	(2.7)	33.7	(3.4)	27.2	(3.6)	(639)
Total sample[d]	7.9	(0.8)	6.8	(0.8)	5.5	(0.8)	(1981)

Note: Part I sample n = 4,004, Part II sample n = 1,981. Disorders with a low prevalence based on n < 20 respondents were not reported.
Abbreviations: CIDI, Composite International Diagnostic Interview; SE, Standard Error.
[a]Severity calculated using Part II weights.
[b]Part I sample, prevalence calculated using Part I weights.
[c]Disorders with hierarchy.
[d]Part II sample, prevalence calculated using Part II weights.

and with BP-I in the case of BPD). These are followed by generalized anxiety disorder (68.3%), alcohol abuse (66.1%), and panic disorder (61.7%).

Number of 12-month disorders is strongly related to severity. (Table 3) Respondents who have exactly 2 comorbid disorders are nearly twice as likely to be rated serious as those with only 1 disorder (53.0 vs. 25.7%; χ^2_1 = 13.0 p < .001). And respondents with 3 + 12-month disorders are about 50% more likely than those with two disorders to be rated serious (70.8 vs. 53.0%; χ^2_1 = 2.8 p = .09). Based on these differences, the 3.0% of Saudis with 12-month mental disorder multimorbidity (15.0% of all 12-month cases) account for more than one-fourth (27.2%) of all serious cases and the 7.8% of Saudis with either 12-month mental disorder comorbidity or multimorbidity (39.0% of all 12-month cases) account for more than half (59.8%) of all serious cases. The 12.3% of the population with a single 12-month disorder (61.0% of all 12-month cases), in comparison, account for 40.2% of all serious cases.

3.3 | Socio-demographic correlates of 12-month prevalence and persistence

An earlier report in this issue presented data on socio-demographic correlates of lifetime disorders (Altwaijri et al., 2020) (see Appendix-Table 1 for distributions). Given that we found in the current report that many of these disorders have high persistence, it would not be surprising if similar socio-demographic correlates were found for 12-month prevalence even if these correlates are not associated with persistence. We consequently compared the socio-demographic correlates of 12-month prevalence and 12-month persistence.

Before doing this, though, we needed to adjust for the fact that respondents vary both in age-of-onset(AOO) and time-since-onset(-TSO) of their disorders and the fact that these differences can influence estimates of the socio-demographic predictors of persistence due to the fact that some socio-demographic variables are correlates of AOO (de Girolamo, McGorry, & Sartorius, 2019). This can occur either because some socio-demographic variables (e.g., gender) are predictors of AOO or because early onset of some disorders can influence subsequent socio-variables(e.g., educational attainment, marital status). As it happened, though, preliminary analysis found that AOO was associated significantly with 12-month persistence of only one disorder after controlling TSO: adult separation anxiety disorder. And this OR was only marginally significant (OR = 1.1, 95% CI = 1.0–1.2) (Appendix Table 2). We adjusted for this in our subsequent analysis of the socio-demographic correlates of persistence, where we controlled for age at interview rather than TSO (Appendix Table 4).

We focus here on socio-demographic correlates of disorder classes. See Appendix Tables 3a–c for disorder-specific associations. Consistent with the cohort differences in age-of-onset distributions found in the paper on lifetime prevalence (Altwaijri et al., 2020), generally inverse associations of age at interview were found with each class of 12-month disorders. All significant ORs in groups younger than ages 50–65 are greater than 1.0: monotonically decreasing (with increasing age) ORs of 2.4–7.0 for mood disorders and monotonically decreased ORs of 4.2–3.3 in the two youngest age groups (15–24, 25–34) for disruptive behavior disorders. The associations of age with other classes of disorder are nonsignificant (χ^2_3 = 0.5–1.2, p = .31–.66). Furthermore, as expected, we found that the socio-demographic predictors of 12-month prevalence are similar in many ways to those of lifetime prevalence. Women have significantly elevated odds of anxiety disorders compared to men (OR = 2.1, 95% CI = 1.2–3.8). (Tables 4 and 5) Disaggregation showed that this is due to significantly elevated ORs of generalized anxiety disorder, agoraphobia, and obsessive–compulsive disorder in the range OR = 2.6–4.5, whereas the ORs for the other anxiety

TABLE 3 Prevalence and severity of pure, comorbid, and multimorbid 12-monthDSM-IV/CIDI disorders in the Saudi National Mental Health Survey[a]

	Severity							
	Prevalence		Serious		Moderate		Mild	
	%	(SE)	%	(SE)	%	(SE)	%	(SE)
I. Distribution of number of disorders by severity								
Exactly 1 disorder	12.3	(1.0)	40.2	(3.4)	64.6	(5.3)	86.4	(4.8)
Exactly 2 disorders	4.8	(0.6)	32.6	(4.4)	23.4	(4.0)	12.4	(4.7)
3+ disorders	3.0	(0.5)	27.2	(3.7)	12.0	(3.9)	1.2	(0.9)
II. Distribution of severity by number of disorders								
Exactly 1 disorder	—		25.7	(2.8)	35.7	(4.2)	38.6	(4.9)
Exactly 2 disorders	—		53.0	(6.7)	32.9	(6.1)	14.1	(4.9)
3+ disorders	—		70.8	(8.0)	27.1	(7.9)	2.1	(1.6)
Any disorder	20.2	(1.3)	39.0	(2.7)	33.7	(3.4)	27.2	(3.6)

Note: Part II sample n = 1,981.

Abbreviations: CIDI, Composite International Diagnostic Interview; SE, Standard Error.

[a]Estimates reflect weighted person-level data. A significant difference in distributions of disorder severity by number of 12-month disorders was observed (χ^2_4 = 9.2; p < .001).

disorders, although consistently elevated for women (OR = 1.4–2.0), are not statistically significant (Appendix Table 1). Women also have significantly elevated odds of mood disorders (OR = 1.6, 95% CI = 1.1–2.5) compared to men, which disaggregation showed to be due to a significantly elevated OR of MDD (OR = 3.8) but not BPD (OR = 0.7).

TABLE 4 Demographic predictors of 12-month prevalence of DSM-IV/CIDI disorders and persistence among lifetime cases in the Saudi National Mental Health Survey[a]

	Any anxiety disorder[b]				Any mood disorder[c]				Any eating disorder[b]			
	Prevalence		Persistence		Prevalence		Persistence		Prevalence		Persistence	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Age[d]												
15–24	1.2	(0.4–3.9)	0.6	(0.0–8.0)	7.0*	(2.8–17.5)	6.4	(0.1–344.2)	2.0	(0.6–6.5)	1.6	(0.1–23.1)
24–34	1.4	(0.5–3.5)	0.4	(0.0–4.4)	3.2*	(1.4–7.5)	2.3	(0.1–52.6)	2.4	(0.8–7.6)	1.3	(0.3–5.9)
35–49	1.0	(0.4–2.7)	0.7	(0.1–4.2)	2.4*	(1.0–5.5)	2.3	(0.4–13.8)	1.0	—	1.0	—
50+	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—
$\chi^2_{2\text{-}3}$	0.5		0.3		6.1*		0.9		1.2		0.1	
Gender												
Female	2.1*	(1.2–3.8)	1.7	(0.9–3.4)	1.6*	(1.1–2.5)	1.6	(0.7–3.3)	1.5	(0.7–2.9)	4.7*	(1.6–13.6)
Male	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—
χ^2_1	6.8*		2.5		5.7*		1.4		1.2		8.6*	
Education[d]												
Student	1.2	(0.6–2.5)	1.8	(0.7–4.8)	0.6	(0.3–1.3)	0.8	(0.2–4.7)	0.5	(0.1–1.8)	0.3	(0.0–1.9)
Low	0.6	(0.3–1.6)	1.4	(0.5–4.3)	0.4*	(0.2–0.8)	1.2	(0.3–4.5)	0.1*	(0.0–0.6)	0.4	(0.0–2.6)
Low-average	1.2	(0.6–2.6)	2.2	(1.0–5.0)	1.0	(0.4–2.2)	4.2*	(1.2–15.0)	0.5	(0.2–1.7)	1.1	(0.2–6.7)
High-average	1.4	(0.8–2.5)	1.9	(0.9–3.9)	0.6	(0.4–1.2)	1.2	(0.5–2.8)	0.3*	(0.1–0.7)	0.3	(0.1–1.2)
High	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—
χ^2_4	1.1		1.0		2.6*		1.3		2.8*		1.1	
Income[d]												
Low	0.9	(0.6–1.4)	1.2	(0.6–2.3)	1.0	(0.6–1.6)	0.8	(0.3–1.8)	0.9	(0.4–1.9)	0.6	(0.2–2.1)
Low-average	0.9	(0.5–1.7)	1.6	(0.7–4.0)	1.9	(0.9–4.0)	3.1	(1.0–10.2)	0.4	(0.1–1.5)	0.1*	(0.0–0.7)
High-average	1.5	(0.9–2.4)	1.4	(0.7–3.1)	0.9	(0.6–1.5)	1.1	(0.5–2.8)	1.6	(0.6–4.4)	1.5	(0.3–6.7)
High	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—
χ^2_3	1.3		0.5		1.4		2.4		1.3		2.0	
Marital status[d]												
Previously married	2.2*	(1.1–4.4)	1.3	(0.4–4.0)	2.4*	(1.2–4.8)	1.4	(0.4–4.5)	3.1*	(1.1–8.9)	0.8	(0.2–3.3)
Never married	1.2	(0.7–2.1)	2.4*	(1.1–5.5)	0.5	(0.3–1.0)	1.1	(0.4–3.5)	1.0	—	1.0	—
Currently married	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—
$\chi^2_{1\text{-}2}$	2.6		2.4		4.7*		0.2		4.6*		0.1	
Overall												
$\chi^2_{11\text{-}13}$[e]	3.3*		1.2		4.4*		1.3		4.9*		1.9	

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

Note: Estimates reflect weighted person-level data.

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

[a]Within each class of disorder, models controlled for lifetime onset of the first disorder, time since most recent disorder (in years), and number of lifetime disorders. For the anxiety class of disorders, there are n = 647 lifetime cases predicting n = 367 12-month cases. For mood disorders, there are n = 357 lifetime cases predicting n = 244 12-month cases. For disruptive behavior disorders, there are n = 288 lifetime cases predicting n = 158 12-month cases. For substance disorders, there are n = 108 lifetime cases predicting n = 53 12-month cases. For eating disorders, there are n = 169 lifetime cases predicting n = 97 12-month cases. For any mental disorder, there are n = 922 lifetime cases predicting n = 617 12-month cases.

[b]Disorders assessed in the Part II sample.

[c]Disorders assessed in the Part I sample.

[d]Variables defined at the age of interview.

[e]Due to sparse demographic cells in predicting any disruptive behavior disorder, any substance disorder, and any eating disorder, the reference groups for age was collapsed to 35+ (from 50+) and for marital status to never married or married (from married). Therefore, the overall chi-squares reflect 2 fewer degrees of freedom (11 vs. 13).

TABLE 5 Demographic predictors of 12-month prevalence of DSM-IV/CIDI disorders and persistence among lifetime cases in the Saudi National Mental Health Survey[a]

	Any disruptive behavior disorder[b]				Any substance disorder[b]				Any disorder[b]			
	Prevalence		Persistence		Prevalence		Persistence		Prevalence		Persistence	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Age[c]												
15–24	4.2*	(2.0–8.8)	0.2	(0.0–1.9)	1.9	(0.6–5.6)	6.2	(0.2–181.1)	3.0*	(1.3–6.8)	1.1	(0.2–8.3)
24–34	3.3*	(1.9–5.8)	0.3	(0.1–1.6)	1.7	(0.4–6.3)	1.4	(0.1–14.3)	2.4*	(1.2–5.0)	0.5	(0.1–3.1)
35–49	1.0	—	1.0	—	1.0	—	1.0	—	1.4	(0.6–3.1)	0.7	(0.2–3.1)
50+	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—
$\chi^2_{2\text{-}3}$	11.3*		1.0		0.6		0.9		4.8*		1.1	
Gender												
Female	0.8	(0.5–1.3)	1.6	(07–3.5)	0.7	(0.3–1.6)	2.4	(0.5–10.6)	1.8*	(1.2–2.7)	2.5*	(1.4–4.5)
Male	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—
χ^2_1	0.7		1.5		0.8		1.3		9.0*		9.5*	
Education[c]												
Student	0.9	(0.4–2.2)	1.1	(0.3–4.0)	2.0	(0.2–16.3)	0.3	(0.0–9.8)	1.0	(0.5–1.9)	1.7	(0.7–4.2)
Low	0.5	(0.2–1.3)	0.5	(0.2–1.8)	1.6	(0.2–13.2)	0.1	(0.0–2.1)	0.6	(0.3–1.3)	1.2	(0.5–3.1)
Low-average	0.6	(0.2–1.6)	0.3	(0.1–1.1)	2.7	(0.5–14.1)	0.1	(0.0–1.1)	1.3	(0.6–2.6)	1.7	(0.7–3.9)
High-average	0.9	(0.4–1.8)	0.4	(0.2–1.3)	1.9	(0.4–8.0)	0.2	(0.0–1.6)	1.0	(0.6–1.7)	1.3	(0.7–2.3)
High	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—
χ^2_4	0.6		1.4		0.6		1.0		1.3		0.5	
Income[c]												
Low	0.7	(0.4–1.2)	0.2*	(0.1–0.6)	1.8	(0.5–6.5)	2.2	(0.6–7.8)	0.8	(0.6–1.2)	0.8	(0.5–1.3)
Low-average	0.5	(0.2–1.0)	0.2*	(0.0–0.9)	2.8	(0.6–12.3)	7.2	(0.8–67.5)	0.8	(0.4–1.3)	0.7	(0.3–1.5)
High-average	1.1	(0.6–2.2)	0.7	(0.2–2.6)	2.2*	(1.0–4.5)	169.4*	(11.8–2,435.3)	1.3	(0.9–2.0)	1.5	(0.6–3.6)
High	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—
χ^2_3	2.0		3.3*		1.6		5.0*		1.8		2.2	
Marital status[c]												
Previously married	2.4	(0.6–9.0)	0.6	(0.2–2.7)	6.8*	(1.9–23.6)	7.3	(1.0–56.5)	2.4*	(1.3–4.4)	1.0	(0.4–2.6)
Never married	1.0	—	1.0	—	1.0	—	1.0	—	0.8	(0.6–1.2)	1.0	(0.6–1.8)
Currently married	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—	1.0	—
$\chi^2_{1\text{-}2}$	1.5		0.4		9.1*		3.8		3.8*		0.0	
Overall												
$\chi^2_{11\text{-}13}$[d]	4.6*		1.8		3.0*		2.2*		6.6*		2.8*	

Note: Estimates reflect weighted person-level data.

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

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

[a]Within each class of disorder, models controlled for lifetime onset of the first disorder, time since most recent disorder (in years), and number of lifetime disorders. For the anxiety class of disorders, there are n = 647 lifetime cases predicting n = 367 12-month cases. For mood disorders, there are n = 357 lifetime cases predicting n = 244 12-month cases. For disruptive behavior disorders, there are n = 288 lifetime cases predicting n = 158 12-month cases. For substance disorders, there are n = 108 lifetime cases predicting n = 53 12-month cases. For eating disorders, there are n = 169 lifetime cases predicting n = 97 12-month cases. For any mental disorder, there are n = 922 lifetime cases predicting n = 617 12-month cases.

[b]Disorders assessed in the Part II sample.

[c]Variables defined at the age of interview.

[d]Due to sparse demographic cells in predicting any disruptive behavior disorder, any substance disorder, and any eating disorder, the reference groups for age was collapsed to 35+ (from 50+) and for marital status to never married or married (from married). Therefore, the overall chi-squares reflect 2 fewer degrees of freedom (11 vs. 13).

We also replicated the finding in the lifetime analysis that respondents with the lowest level of education have significantly lower odds of mood (OR = 0.4, 95% CI = 0.2–0.8) and eating (OR = 0.1, 95% CI = 0.0–0.6) disorders than those with the highest level of education, although we did not replicate the finding in the lifetime analysis that low education is associated with significantly reduced odds of anxiety disorders. Disaggregation showed that the association of low education with mood disorders is due to significantly reduced odds of both BPD and MDD (OR = 0.4–0.3) and that the association with eating disorders is due to nonsignificantly reduced odds of both binge-eating disorder and bulimia nervosa (OR = 0.2–0.4). We also found, consistent with the lifetime analysis, that previously married people have significantly elevated odds of 12-month anxiety (OR = 2.2, 95% CI = 1.1–4.4) and mood (OR = 2.4, 95% CI = 1.2–5.2) disorders compared to the married. Disaggregation showed that these differences are due to elevated odds of generalized anxiety disorder, obsessive–compulsive disorder, and MDD (OR = 2.4–4.8). However, unlike with lifetime prevalence, previously married people also have elevated prevalence of 12-month eating disorders (OR = 3.1, 95% CI = 1.1–8.9) and substance use disorders (OR = 6.8, 95% CI = 1.9–23.6). Finally, we found no significant associations of income with 12-month prevalence of any class of disorders (χ^2_4 = 1.3–2.0, p = .12–.28).

The parallel analysis of 12-month persistence showed that most of the significant associations between socio-demographics and 12-month disorders were due to the associations of these predictors with lifetime disorders rather than with 12-month prevalence among lifetime cases. Indeed, the multivariate equation for the joint associations of all socio-demographics with each class of 12-month disorders, while significant in predicting 12-month prevalence of each disorder class ($\chi^2_{11\text{-}13}$ = 3.0–4.9, p = <.001), became nonsignificant in four out of five cases when we instead predicted 12-month persistence ($\chi^2_{11\text{-}13}$ = 1.3–2.0, p = .12–.28). All significant associations of individual predictors with prevalence of specific disorder classes also became insignificant, as did the significant associations of age and marital status with any 12-month prevalence. The only significant predictor of prevalence that remained significant in predicting persistence was gender predicting any 12-month disorder, where the OR for prevalence was 1.8 (95% CI = 1.2–2.7) and the OR for persistence was 2.5 (95% CI = 1.4–4.5). In addition, there were three cases in which the predictor was not significant for prevalence but was for persistence: Women had more persistent eating disorders than men. Respondents with high-average or high incomes had more persistent disruptive behavior disorders than those with lower incomes. And respondents with high-income had less persistent substance use disorders than those with lower incomes.

3.4 | Socio-demographic correlates of severity

It is also of interest to examine socio-demographic correlates of having a serious 12-month disorder. There is a significant monotonically decreasing association between age and odds of this outcome across the four broad age groups in the sample (χ^2_3 = 7.5, p = .009; ORs = 11.1–4.5), but this is partly due to the association of age with lifetime prevalence and persistence. We can see this indirectly by noting that the strength of the association weakens when it is estimated among lifetime cases in Model 2 (χ^2_3 = 3.7, p = .013; ORs = 7.1–4.2) and weakens even further but remains significant when it is estimated among 12-month cases in Model 3 (χ^2_3 = 3.1, p = .028; ORs = 6.0–4.5). (Table 6)

Women are significantly more likely than men to have a 12-month serious disorder (OR = 2.0, 95% CI = 1.2–3.3), but this is due to the higher probability of women than men having a 12-month disorder. In other words, there is no significant gender difference in odds of 12-month serious disorder among respondents with any 12-month disorder (χ^2_1 = 0.8, p = .38). Education and income, in comparison, have nonsignificant associations with 12-month serious mental disorder in the total sample as well as among respondents with lifetime and 12-month disorders (χ^2_3 = 1.2–2.0, p = .10–.32). Marital status, finally, has a significant association with 12-month serious mental disorder in the total sample (χ^2_2 = 5.6, p = .005) that becomes nonsignificant in the subsample of people with 12-month disorders (χ^2_2 = 2.6, p = .08), with an initially significant elevated OR among the previously married (OR = 3.0, 95% CI = 1.5–6.1) becoming weaker but still significant in the subsample of respondents with lifetime disorders (OR = 2.3) and nonsignificant in the subsample of respondents with 12-month disorders (OR = 2.1).

4 | DISCUSSION

As noted in our companion paper in this issue on lifetime prevalence), the 12-month prevalence estimates reported here are likely to be conservative because people with mental disorders are less likely than others to participate in surveys about mental illness (Allgulander, 1989) and tend to underreport disorders when they participate in such surveys (Cannell, Marquis, & Laurent, 1977). Given these limitations, it is striking that one out of every five survey respondents (20.2%) is estimated to have experienced a mental disorder at some time in the 12 months before the survey. This estimate is slightly higher than the 17.6% pooled 12-month prevalence estimate in a recent meta-analysis of 174 mental health surveys carried out across 63 countries, although within the interquartile range (IQR; 12.3–24.3%) of these estimates, where IQR is defined as the 25th–75th percentiles of the prevalence distribution across those surveys (Steel et al., 2014). The SNMHS estimate of 20.2% is near the upper end of the distribution of 12-month prevalence across all WMH surveys carried out in high-income countries (Median 12.1%, IQR 9.7–18.9%). Higher estimates were found only in New Zealand (20.7%) and the United States (27.0%) (Kessler et al., 2008).

Disaggregation shows that this comparatively high overall 12-month disorder prevalence in KSA is due largely to anxiety disorders, where the 12.3% prevalence in the SNMHS compares to a median (IQR) of 8.3% (6.5–13.7%) in WMH surveys in other high-income countries (Kessler et al., 2008). And this was despite the SNMHS not assessing specific phobia, which is the most common

TABLE 6 Associations of socio-demographic characteristics with severity of 12-monthDSM-IV/CIDI disorders in the Saudi National Mental Health Survey[a]

	Model 1		Model 2		Model 3	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Age[b]						
15–24	11.1*	(3.6–34.4)	7.1*	(2.1–24.3)	6.0*	(1.7–21.5)
24–34	7.4*	(3.1–17.6)	4.9*	(1.8–13.3)	5.1*	(1.7–15.1)
35–49	4.5*	(1.9–10.8)	4.2*	(1.5–11.5)	4.5*	(1.6–12.9)
50+	1.0	—	1.0	—	1.0	—
χ^2_3	7.9*		3.7*		3.1*	
Gender						
Female	2.0*	(1.2–3.3)	2.0*	(1.1–3.4)	1.3	(0.8–2.1)
Male	1.0	—	1.0	—	1.0	—
χ^2_1	7.1*		5.6*		0.8	
Education[b]						
Student	0.5	(0.2–1.2)	0.5	(0.2–1.3)	0.6	(0.2–1.6)
Low	1.0	(0.5–2.0)	1.9	(0.9–4.2)	2.3	(0.9–5.9)
Low-average	1.0	(0.4–2.4)	1.1	(0.5–2.5)	1.0	(0.4–2.4)
High-average	0.9	(0.5–1.6)	0.9	(0.5–1.7)	1.0	(0.5–2.1)
High	1.0	—	1.0	—	1.0	—
χ^2_4	1.3		2.0		1.5	
Income[b]						
Low	0.9	(0.6–1.5)	1.0	(0.5–1.7)	1.0	(0.5–2.1)
Low-average	1.3	(0.7–2.5)	1.6	(0.8–3.2)	2.1	(0.9–4.9)
High-average	1.5	(0.8–2.6)	1.5	(0.8–2.7)	1.3	(0.5–3.2)
High	1.0	—	1.0	—	1.0	—
χ^2_3	1.2		1.4		1.4	
Marital status[b]						
Previously married	3.0*	(1.5–6.1)	2.3*	(1.2–4.6)	2.1	(0.9–4.7)
Never married	0.6	(0.3–1.2)	0.6	(0.3–1.4)	0.6	(0.3–1.5)
Currently married	1.0	—	1.0	—	1.0	—
χ^2_2	5.6*		3.4*		2.6	
Overall						
χ^2_{13}	6.1*		3.8*		2.0*	

Note: Estimates reflect Part II weighted person-level data.

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

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

[a]Model 2 was assessed in the Part II sample with any lifetime disorder (n = 960) and model 3 in the Part II sample with any 12-month disorder (n = 639).

[b]Variables defined at the age of interview.

anxiety disorder in virtually all WMH surveys (Wardenaar et al., 2017). The anxiety disorders with comparatively high prevalence in the SNMHS include social phobia (Stein et al., 2017), agoraphobia (Roest et al., 2019), separation anxiety disorder (Silove et al., 2015), and obsessive–compulsive disorder (Ruscio, Stein, Chiu, & Kessler, 2010). Interestingly, the high prevalence of these disorders has been noted in KSA over a number of years (Alatiq & Al-Modayfer, 2016; Bassiony, 2005; Chaleby, 1987; Chaleby & Raslan, 1990) and has also been noted in other Arab countries (Tanios et al., 2009). With respect to social phobia being the most common disorder in KSA, it may be that since Saudi society is collectivistic, promoting in-group harmony and obligation to groups, Saudis have an especially high probability of feeling that they are not meeting social obligations and experiencing negative evaluations that plays into the development of social phobia (AlZahrani, 2011; Mulder, 2018).

Other elevated 12-month prevalence estimates were found in the SHMHS compared to WMH surveys in other high-income countries. These included for mood disorders (6.8% compared to 5.2% [3.4–6.5%] in WMH surveys in other high-income countries; Bromet, Andrade, Bruffaerts, & Williams, 2018), intermittent explosive

disorder (2.7% compared to 0.6% [0.1–1.5%] in WMH surveys in other high-income countries; Scott et al., 2016), and drug abuse (1.4% compared to 0.5% [0.3–1.0%] in WMH surveys in other high-income countries; Degenhardt et al., 2019). The comparatively higher prevalence of mood disorders is due to BPD (Kessler, Karam, Lee, Bunting, & Nierenberg, 2018). The few disorders for which SNMHS prevalence estimates are substantially lower than in WMH surveys in other high-income countries include generalized anxiety disorder (Ruscio et al., 2017) and alcohol use disorders (Glantz et al., 2020).

The comparatively high 12-month prevalence of quite a few disorders in the SNMHS compared to WMH surveys in other high-income countries is in stark contrast to the fact that our companion paper on lifetime prevalence in this issue found only two disorders with substantially elevated prevalence in the SNMHS: separation anxiety disorder and attention-deficit/hyperactivity disorder (Altwaijri et al., 2020). The reason for this discrepancy is that 12-month disorder persistence (i.e., the ratio of 12-month prevalence divided by lifetime prevalence unadjusted for population age distributions) is meaningfully elevated (at least 50% higher in SNMHS than the average across WMH surveys in other high-income countries) for quite a few disorders, including panic disorder (de Jonge et al., 2016), adult separation anxiety disorder (Silove et al., 2015), major depressive disorder (Bromet et al., 2018), BPD (Kessler et al., 2018), intermittent explosive disorder (Scott et al., 2016), and drug abuse (Degenhardt et al., 2019). We emphasize, though, that these are elevations in *gross* persistence ratios; that is, ratios that do not adjust for differences in the age distributions across countries. This is relevant because the adult KSA is quite young in comparison to most other high-income countries as indicated by the median age in KSA being nearly a decade lower (30 years of age) than in most high-income countries in Europe (41–-45 years of age), North America (38–40 years of age), and the Pacific (37–46 years of age) (Ritchie & Roser, 2019). This difference influences gross disorder persistence, especially for early-onset disorders, with persistence expected to be higher, all else equal, in countries with younger age distributions. Analyses to investigate this matter in more detail by adjusting for cross-national variation in age distributions to calculate adjusted persistence ratios exceed the scope of this report.

One out of every 12 respondents in the SNMHS (8.7%) experienced a serious mental disorder at some time in the 12 months before the survey. This represents 38.2% of all 12-month cases, which is above the upper end of the range of proportional severity estimates across all WMH surveys in high-income countries, where the median proportion of serious cases among all 12-month cases is 23.2% and the IQR is 18.5–30.7% (Kessler et al., 2009). The high proportional prevalence of serious 12-month disorders in the SNMHS might be due, at least in part, to the fact that we used conservative coding rules for defining disorder prevalence; a point we discussed in the companion paper in this issue on the clinical reappraisal of the CIDI diagnoses in the SNMHS survey (Altwaijri et al., 2020). This might have led us to underestimate prevalence of nonserious 12-month disorders, resulting in an overestimation of the proportion of 12-month cases that are serious.

Even in terms of absolute prevalence, though, 8.7% of the population meeting criteria for a serious 12-month disorder is high in relation to other WMH surveys in high-income countries, where the median is 3.5% and the IQR is 1.9–4.2% (Kessler et al., 2009). The comparatively high proportion of 12-month cases rated by respondents as serious is not confined to any subset of disorders but is high across virtually all disorders relative to previous WMH estimates (e.g., Kessler, Chiu, Demler, Merikangas, & Walters, 2005). This might indicate a difference in the way Saudis interpret the translation of the word "severe" in the SDS scales, as ratings of disorder-specific role impairments as severe accounted for the vast majority of the SNMHS cases classified serious, but this possibility would require a more focused analysis of the objective markers of severity than we can undertake in this initial set of reports.

Age is an important socio-demographic correlate of 12-month prevalence, with respondents in the age range 15–34 having significantly elevated rates of mood and disruptive behavior disorders. Similar associations have been found in the vast majority of other WMH surveys across the world (Scott et al., 2018) but these surveys also typically find that young people have elevated rates of eating disorders (Kessler et al., 2013) and drug use disorders (Degenhardt et al., 2019), neither of which is found in the SNMHS. It is unclear why these age patterns do not exist in the SNMHS.

The associations of other socio-demographics with 12-month prevalence are also similar in many ways to those found in other WMH surveys, but there are also some striking differences. The elevated odds of both anxiety and mood disorders among women versus men are like those found in the vast majority of other WMH surveys (Scott et al., 2018). However, these other surveys also typically found that eating disorders are significantly more common among women than men (Kessler et al., 2013) and that both disruptive behavior disorders (Fayyad et al., 2017; Nock, Kazdin, Hiripi, & Kessler, 2007; Scott et al., 2016) and substance use disorders (Degenhardt et al., 2019) are more common among men than women, neither of which we found in the SNMHS. Nor did we find significant associations of family income with any 12-month disorder category. This is quite different from the results in other WMH surveys in high-income countries, where a strong inverse association is typically found between income and prevalence of serious 12-month mental illness (Levinson et al., 2010). The fact that a similar association does not exist in the SNMHS is presumably related to the fact that a much stronger economic safety net exists in KSA than in most other high-income countries (Kaboub, Forstater, & Kelsay, 2015). The associations of high educational attainment with high odds of mood and eating disorders are also quite different from the inverse associations between educational attainment and mental disorder found in many other countries. The elevated odds of several 12-month disorders among the previously married compared to the currently married, though, are generally consistent with the pattern found in other WMH surveys (Kessler et al., 2008). We have not investigated the associations of socio-demographics with severity among people with 12-month disorders in most other WMH surveys, so we have no broad basis for comparison of our finding that these associations are for the most part nonsignificant in the SNMHS.

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CONFLICT OF INTEREST

The authors declare no potential conflict of interest.

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SUPPORTING INFORMATION

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

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