Original Article

Twelve-month Prevalence and Correlates of Psychiatric Disorders in Iran: The Iranian Mental Health Survey, 2011

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Abstract

Importance: No national information is available on the epidemiology of psychiatric disorders in Iran for the last decade.

Objectives: To estimate the 12-month prevalence of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) psychiatric disorders in Iranian population, and to investigate the severity and correlates of psychiatric disorders.

Design, setting and participants: The Iranian Mental Health Survey (IranMHS) was a nationally representative face-to-face household survey with a multistage, cluster sampling design that was carried out in 2011. A total of 7886 community dwelling residents aged 15–64 were recruited.

Main outcome measures: 12-month diagnoses of DSM-IV psychiatric disorders including mood, anxiety, and substance use disorders were assessed using a validated Persian translation of the Composite International Diagnostic Interview (CIDI; version 2.1). The Structured Clinical Interview for DSM-IV Axis I disorders (SCID-I) was administered by a psychiatrist on subjects screened positive for the presence of a psychotic disorder. The severity of psychiatric disorders was determined using criteria that included markers for disability, particular diagnoses and suicide attempts.

Results: The response rate was 86.2%. The 12-month weighted prevalence of "any psychiatric disorder" was 23.6% [95% confidence interval (CI): 22.4–24.8] with 26.5% of women and 20.8% of men having one or more psychiatric disorders. The most common category of psychiatric disorders was any anxiety disorder (15.6%) and the most prevalent particular disorder was major depressive disorder (12.7%), followed by generalized anxiety disorder (5.2%) and obsessive-compulsive disorder (5.1%). A 12-month psychotic disorder was observed in 0.5% of the population (95% CI: 0.33–0.66). Almost two-thirds (63.8%) of individuals with a mental disorder had moderate or serious illness. Unemployment, being widowed/divorced and urban living were associated with a greater likelihood of 12-month disorders; while, higher socioeconomic status and having a university degree were associated with a lower likelihood.

Conclusion: The high prevalence of psychiatric disorders, particularly major depression, merits further attention in the country's mental health policy and program planning.

Key words: Epidemiology, Iran, Mental Health Survey, psychiatric disorders, prevalence

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Introduction

Iran is a large country located in the Middle East with a population of more than 75 million, making it the 17th most populated country in the world.[1] The country has been undergoing rapid demographic, societal and economic changes in the last few decades. The urban dwelling proportion of the population has increased from 27% in 1950 to 71.4% in 2011.[1] The population growth rate has also decreased, leading to a change in age structure, with young people aged 20–29 years becoming the largest age group, compared with other 10-year categories in the country.[1] Iran has faced several adversities in the last few decades; including an 8-year war in the 1980s, severe economic sanctions and numerous natural disasters in more recent years. Nonetheless, during the same period, the national health status improved as evidenced by increased life expectancy, and reductions in infant and maternal mortality rates.[2] There were also advances in the health care system of the country including increased per capita expenditure on health and improved access to services.[2] Little is

known about the possible impact of the above-mentioned socio-demographic, economic, and health care system developments on the population's mental health status. Addressing the mental health care needs of the population requires up-to-date national level information. The only available nationwide study of the mental health status of the Iranian population dates back to more than 10 years ago.[3,4]

The Iranian Mental Health Survey (IranMHS) was designed and conducted to provide first-hand information in order to aid policy-making at the national level. It is a comprehensive and nationally representative survey of the prevalence and severity of psychiatric conditions, as well as the current status of service utilization and costs of mental health care. This article reports the results pertaining to the former objective, and aims to present the 12-month prevalence and severity of psychiatric disorders and correlates of the presence of psychiatric disorder in the Iranian community-dwelling population.

Materials and Methods

Sample

The methodology of the IranMHS is described in detail elsewhere.[5] Briefly, this study was a household survey conducted on individuals aged 15–64 years residing in Iran. A three-stage cluster sampling method was employed: first, 1525 blocks were selected proportional to the size of each province based on the latest national census database.[6] In the second stage, households in each block were counted and 6 households in each block were selected through systematic random sampling. In the third stage, the individual to be interviewed in each selected household was determined using a method described by Kish.[7] Individuals who could not comprehend Persian (the official and widely used language in Iran) or had severe physical or mental disability, which made them unable to understand and respond properly to the study questions, and those with nationalities other than Iranian were excluded. The selected individuals who were unable to or refused to participate were not replaced. However, measures were taken to achieve the highest response, such as repeated visits for no shows. The survey was conducted from January to June 2011 and a total of 7886 individuals participated in the survey.

Measures

The 12-month version of the Composite International Diagnostic Interview (CIDI, version 2.1), was employed to determine the presence of the following psychiatric disorders according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) in the 12 months before the interview: major depressive disorder, dysthymia, bipolar I disorder, panic disorder (with and without agoraphobia), agoraphobia without panic, obsessive-compulsive disorder, social phobia, post-traumatic stress disorder, and alcohol and other substance use disorders. The substances included cannabis, opioids, amphetamine-type stimulants, hallucinogens and inhalants. Because the abuse of other substances (e.g. cocaine) is rare in Iran, we did not assess each of these "other drugs" separately. But the subjects were asked if they had used any other substances and if positive, relevant questions were asked for the specified drug.

The CIDI is a structured interview developed by the World Health Organization (WHO) designed for use by trained interviewers who may be lay persons. This tool has been shown to have high inter-rater and test-retest reliability and high validity for most diagnoses in different settings and languages.[8,9] The Persian translation of CIDI 2.1[10] has been validated and has shown adequate psychometric properties; with the exception of psychotic disorders, which are difficult to assess in a structured interview. Also, in a pilot study in a sample from general population, we observed good inter-rater reliability of diagnoses made by the Persian translation of the CIDI 2.1.[5]

Estimating the prevalence of psychotic disorders has always been a challenging task. These illnesses are uncommon in the general population and the assessments require large sample sizes. Furthermore, relying solely on structured interviews has shortcomings, mainly due to poor psychometric properties of these instruments. Assessments based exclusively on self-reports of the participants are prone to misinterpretation of the questions and underreporting of psychotic symptoms due to lack of insight. To overcome these barriers, we adopted a two stage procedure as proposed by other investigators.[11] In the first stage (screening), the participants were inquired about the presence of self-reported delusional beliefs and hallucinations using the items from the G section of the lifetime version of the CIDI. Subsequently, all subjects who had endorsed one or more items, as well as those with a history of hospitalization for a psychiatric illness, were contacted to participate in the second stage. The latter incorporated telephone administration of the Persian translation of the Structured Clinical Interview for DSM-IV Axis I disorders (SCID-I)[12] to determine the presence of *any primary psychotic disorder* (not attributable to substance abuse or a general medical condition) in the past 12 months. The source of information included both the subject and a significant other who was usually either a spouse or a first degree relative. We did not differentiate the specific types of psychotic illnesses (such as schizophrenia or affective psychoses) as we were only interested in estimating the prevalence of any illness with psychotic features as an indicator of a very severe mental illness. SCID-I was administered by a psychiatrist. The Persian translation of the SCID-I yields DSM-IV diagnoses with good reliability and validity.[12] The sensitivity of the telephone-administered Persian version of SCID-I for psychotic disorders is comparable to the sensitivity of the face-to-face administered version of the instrument.[13]

Sheehan Disability Scale (SDS)[14] was used to assess the degree of disability associated with the presence of any mental illness. SDS is widely used in general population surveys[15–17] to assess disability in work role performance, household maintenance, social life, and intimate relationships. Disability on each domain is rated on a 0-10 visual analog scale with possible ratings of none (0), mild (1–3), moderate (4–6), and severe disability (7–10).[14] Similar to the English version, the Persian translation of SDS has been shown to be reliable and valid.[18] Days out of role because of a psychiatric disorder was also assessed as a measure of disability and severity (see below). Participants were asked about the number of days in the past 12 months in which they were totally unable to carry out their normal daily activities due to any psychiatric condition.

Based on psychiatric diagnoses, symptoms and disability ratings, participants were classified into those with serious, moderate or mild psychiatric disorders according to the criteria used in the World Mental Health survey[15] with some minor modifications. Those with a serious disorder had either a psychotic disorder, bipolar I disorder or substance dependence with a physiological de-

pendence syndrome; had made a suicide attempt in the presence of any other DSM-IV disorder; or had reported severe role impairment due to a mental disorder in at least two areas on the SDS. Subjects not classified as having a serious disorder were classified as moderate if interference was rated as at least moderate in at least two SDS domains, or if the subject had substance dependence without a physiological dependence syndrome. All other participants were classified as mild.

Socioeconomic status of participants was assessed using a questionnaire which has been used in a previous nationwide survey.[19] The questionnaire ascertains the status based on household assets, such as accommodation, accessories, and possession of cars.

Interviewer training and procedures

Interviewers were comprised of 232 professionals with a master's degree in psychology or a bachelor's degree with a psychology major. Training consisted of a 7-day, 56-hour workshop of instruction and practice sessions that included in-depth training on administration of CIDI using the standard protocols and training materials developed by the World Health Organization.[20,21] Each Interviewer also took part in at least 2 pilot interviews with real subjects before the main phase of the study; and received appropriate feedback from experienced interviewers. In each province, a local executive manager and a supervisor (a member of research team) were assigned to ensure the quality of the procedures.

The feasibility and acceptability of the interviews and the limitations were assessed in a pilot study in a selected area of the capital, Tehran, as well as an urban and a rural area of the Khoozestan Province in South-west of Iran. We modified the data collection and quality control procedures for the main study based on feedback from the implementation of the pilot phase.

All interviews were conducted face-to-face at subjects' place of residence. We made our best efforts to make sure that all interviews were conducted in privacy. All completed questionnaires were reviewed and edited by the local executive manager. A third of all questionnaires were double-checked by a supervisor. Errors or inconsistencies were returned to the interviewers for resolution. This involved re-interview with the participants in some cases. All procedures were approved by local Institutional Review Boards. Informed consents were obtained from all participants and all data were processed anonymously.

Statistical analysis

Analyses were conducted in two stages. First, we computed prevalence estimates and 95% confidence intervals for individual DSM-IV disorders as well as for any 12-month psychiatric disorder. Next, we used logistic regression models to examine the correlates of psychiatric disorders in this setting. Survey weights were used in all analyses. The consolidated weights were the joint product of inverse probability of unit selection into the sample (w1), non-response weights (w2) and post-stratification weights (w3). W1 included weighting by the number of eligible individuals in each household and w3 was calculated through dividing the proportion of subjects in each stratum in National Census 2006 was by the proportion of the same group in the sample. Based on 5-year age groups, sex and urbanicity status in each of the 31 country provinces, 1240 post-stratification weights were generated. All the results are based on complex sample survey analysis, in which provinces are considered as strata and blocks as clusters.

Among 475 subjects who were screened positive for psychotic disorders, 118 did not respond to the telephone SCID interview. We regarded them as item non-responses and used the method of multiple imputations to impute missing responses.[22] The model for imputation consisted of a logistic regression to predict SCID 12-month diagnoses of psychotic disorders from a set of variables, including age, gender, urban vs. rural place of residence, outpatient service use, inpatient service use, number of psychotic symptoms, number of DSM-IV disorders, and number of areas of disability in the Sheehan Disability Scale (AUC = 0.96). The regression was weighted to account for sampling probabilities of selection. The multiple imputation estimates command in STATA was used to adjust the estimates of prevalence and produce 95% confidence intervals and 10 imputations were used for each analysis.

Analyses were conducted using STATA statistical package, version 12 (STATA Corporation, College Station, TX, USA, 2009). All percentages reported are weighted unless stated otherwise.

Results

Of 9150 individuals approached by interviewers, 7886 (86.2%) agreed to participate in the study. The non-responder group included a higher percentage of men (56.3% vs. 43.0%, $P < 0.001$) and were slightly older (34.7 vs. 33.0 years-old, $P = 0.004$). The characteristics of the samples are presented in Table 1.

Twelve-month prevalence and severity of psychiatric disorders

The 12-month prevalence of psychiatric disorders is presented in Table 2. As shown, 23.6% of the Iranian population aged 15 to 64 years met the criteria for at least one DSM-IV psychiatric disorder in the past 12 months. In total, 1067 (13.4%) met the criteria for only one disorder, 493 (6.3%) two and 328 (3.9%) three or more disorders. Prevalence estimates for any psychiatric disorder by sex and age groups are presented in Figure 1.

The most prevalent group of disorders was the group of anxiety disorders (15.6%), followed by mood disorders (14.6%). The most prevalent particular DSM-IV disorder was major depressive disorder (12.7%), followed by generalized anxiety disorder (5.2%) and obsessive-compulsive disorder (5.1%). The prevalence estimates were significantly higher among women than men for certain psychiatric disorders including major depressive disorder, agoraphobia without panic, social phobia and obsessive-compulsive disorder (Table 2). The characteristics of participants according to groups of psychiatric disorders are presented in Appendix Table 1 in the supplement.

Any 12-month psychiatric disorder, as well as anxiety and depressive disorders, were split almost evenly in terms of level of severity (see Table 3). We compared mean days out of role for external validation of our severity criteria. For the no-disorder category, the mean days out of role was 2.6 (95% CI: 2.3–3.0). The values for the mild, moderate and serious groups were 8.3 (6.1–10.5), 17.1 (13.4–20.7), and 35.6 (30.1–41.2) days, respectively. This finding supports the validity of the SDS ratings.

Socio-demographic correlates of any psychiatric disorder

The results of unadjusted and adjusted logistic regression analyses of the socio-demographic correlates of *any psychiatric disorder* are presented in Table 4. Women had a greater odds of meeting the criteria for any psychiatric disorder [Adjusted Odds Ratio (aOR) = 1.47], as did previously married participants compared to

Table 1. Socio-demographic characteristics of the IranMHS respondents (N = 7886).

Characteristics	*N*	Un-weighted %	Weighted % (SE)
Gender			
Male	3,387	42.9	50.5 (0.7)
Female	4,499	57.1	49.5 (0.7)
Age group (years)			
19–15	998	12.7	18.1 (0.6)
29–20	2,549	32.3	33.8 (0.6)
39–30	2,200	27.9	21.8 (0.5)
49–40	1,188	15.0	15.3 (0.5)
59–50	704	9.0	8.7 (0.4)
64–60	247	3.1	2.5 (0.2)
Marital Status			
Never married	2,025	25.7	33.0 (0.7)
Married	5,527	70.1	63.5 (0.7)
Previously married	332	4.2	3.6 (0.2)
Education			
Illiterate	646	8.2	5.7 (0.3)
Primary school	1,917	24.4	19.6 (0.6)
Middle school	1,280	16.3	15.5 (0.5)
High school	2,823	35.8	40.7 (0.7)
University	1,208	15.3	18.5 (0.7)
Occupation			
Employed	2,803	35.5	38.4 (0.7)
Students	937	11.9	17.0 (0.6)
Retired	166	2.1	2.4 (0.2)
Housewives	3,241	41.1	32.7 (0.6)
Unemployed	737	9.4	9.5 (0.4)
Residence			
Urban	4,380	55.5	70.9 (1.1)
Rural	3,506	44.5	29.1 (1.1)
Socio-economic status			
Low	2,152	28.0	22.2 (0.7)
Moderate	3,191	41.6	39.7 (0.8)
High	2,330	30.4	38.1 (0.9)

IranMHS = Iranian Mental Health Survey; SE = standard error.

Table 2. Twelve-month prevalence of psychiatric disorders in the IranMHS (N = 7886).

	Total		Female		Male	
Psychiatric disorders	***n***	**% (95% CI)**	***n***	**% (95% CI)**	***n***	**% (95% CI)**
Any anxiety disorder	**1,029**	**15.6 (14.5–16.6)**	**822**	**19.4 (17.9–20.9)**	**387**	**12.0 (10.6–13.4)**
Panic disorder with/ without agoraphobia	182	1.9 (1.6–2.3)	144	2.5 (2.0–3.0)	54	1.4 (0.9–1.8)
Agoraphobia without panic	118	1.5 (1.1–1.8)	91	2.0 (1.5–2.5)	27	0.9 (0.5–1.4)
Social phobia	274	3.2 (2.7–3.6)	191	4.1 (3.4–4.8)	83	2.3 (1.7–2.9)
Generalized anxiety disorder	427	5.2 (4.6–5.8)	275	5.9 (5.2–6.7)	152	4.5 (3.7–5.4)
Obsessive-compulsive disorder	408	5.1 (4.5–5.7)	297	6.8 (5.9–7.6)	111	3.4 (2.7–4.1)
Posttraumatic stress disorder	169	2.1 (1.7–2.4)	106	2.4 (1.9–3.0)	63	1.7 (1.2–2.3)
Any mood disorder	**1,153**	**14.6 (13.6–15.6)**	**766**	**17.3 (15.9–18.7)**	**387**	**11.9 (10.5–13.2)**
Major depressive disorder	1,014	12.7 (11.8–13.7)	678	15.4 (14.1–16.7)	336	10.2 (8.9–11.4)
Dysthymia	110	1.3 (1.0–1.5)	79	1.6 (1.2–2.1)	31	0.9 (0.5–1.3)
Bipolar I disorder	64	1.0 (0.7–1.2)	34	0.8 (0.5–1.1)	30	1.1 (0.7–1.6)
Any substance use disorder [a]	**185**	**2.8 (2.3–3.3)**	**18**	**0.4 (0.2–0.7)**	**167**	**5.2 (4.2–6.1)**
Drug abuse	30	0.5 (0.3–0.7)	1	0.01 (0.0–0.04)	29	1.0 (0.6–1.4)
Drug dependence	130	1.8 (1.5–2.2)	14	0.3 (0.1–0.5)	116	3.3 (2.6–3.9)
Alcohol abuse	15	0.3 (0.1–0.5)	0	0.0	15	0.7 (0.3–1.0)
Alcohol dependence	35	0.6 (0.4–0.9)	3	0.1 (0.0–0.02)	32	1.2 (0.7–1.6)
Any primary psychotic disorder	**31**	**0.50 (0.33–0.66)**	**16**	**0.46 (0.26–0.68)**	**15**	**0.54 (0.28–0.80)**
Any psychiatric disorder	**1,890**	**23.6 (22.4–24.8)**	**1,201**	**26.5 (24.9–28.2)**	**689**	**20.8 (19.1–22.4)**

IranMHS = Iranian Mental Health Survey; CI = confidence interval. [a]Major categories Included: Alcohol, opioid, cannabis, stimulants, hallucinogens, and inhalants.

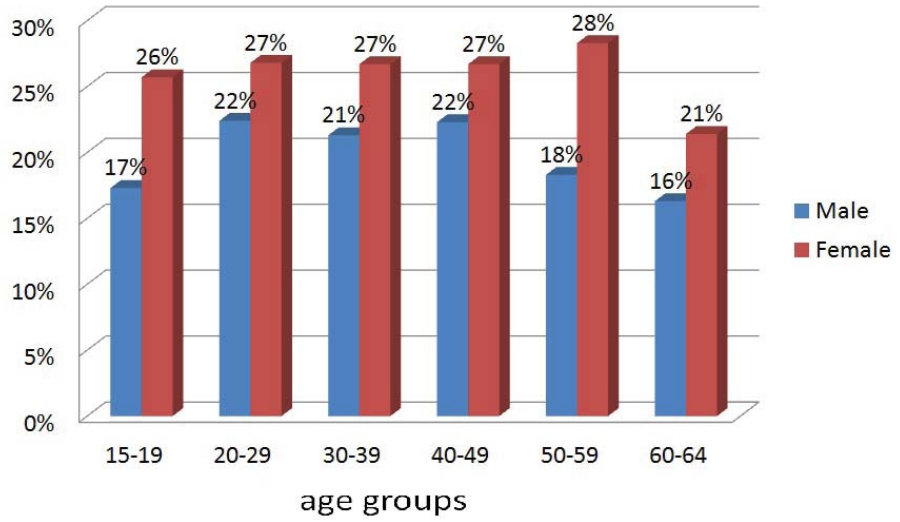

Figure 1. Twelve-month prevalence of any psychiatric disorder by sex and age groups in the Iranian Mental Health Survey (IranMHS) (N=7886).

Appendix Table 1. Socio-demographic characteristics of the IranMHS participants according to 12-month diagnostic groups (N=7886).

	12 months prevalence % (95% CI)			
Socio-demographic characteristics	**Any anxiety disorder**	**Any mood disorder**	**Any substance use disorder [a]**	**Any psychiatric disorder**
Gender				
Male	12.0 (10.6–13.4)	11.9 (10.5–13.2)	5.2 (4.2–6.1)	20.8 (19.1–22.4)
Female	19.4 (17.9–20.9)	17.3 (15.9–18.7)	0.4 (0.2–0.7)	26.5 (24.9–28.2)
Age groups				
19–15	15.3 (12.6–18.0)	12.8 (10.4–15.3)	2.1 (0.9–3.2)	21.4 (18.4–24.4)
29–20	15.6 (13.9–17.2)	15.6 (14.0–17.3)	3.3 (2.4–4.2)	24.6 (22.5–26.6)
39–30	15.8 (14.1–17.2)	13.9 (12.1–15.7)	3.3 (2.4–4.3)	23.9 (21.8–26.1)
49–40	15.9 (13.4–18.4)	16.1 (13.6–18.5)	2.7 (1.6–3.8)	24.5 (21.7–27.3)
59–50	15.7 (12.2–19.2)	14.1 (11.0–17.2)	1.8 (0.4–3.1)	23.4 (19.6–27.3)
64–60	13.7 (8.1–19.3)	11.1 (5.6–16.6)	1.5 (0.0–4.5)	18.9 (12.7–25.1)
Marital status				
Never married	14.6 (12.8–16.5)	14.2 (12.4–16.1)	3.5 (2.4–4.5)	22.8 (20.6–25.1)
Married	15.9 (14.6–17.1)	14.0 (12.8–15.1)	2.4 (1.9–2.9)	23.3 (21.9–24.7)
Previously married	19.9 (14.6–25.2)	29.1 (23.2–35.1)	4.6 (1.7–7.5)	36.1 (29.9–42.3)
Education				
Illiterate	18.1 (14.2–22.1)	15.0 (11.8–18.2)	2.9 (1.2–4.7)	26.4 (22.1–30.7)
Primary	17.7 (15.5–20.0)	15.9 (13.8–17.9)	3.7 (2.5–4.9)	25.9 (23.4–28.3)
Secondary	17.6 (15.1–20.2)	15.3 (13.0–17.7)	3.7 (2.4–4.9)	25.1 (22.2–27.9)
High school	14.8 (13.1–16.4)	14.5 (13.0–16.1)	2.7 (1.9–3.5)	23.3 (21.4–25.1)
University	12.9 (10.7–15.1)	12.7 (10.5–14.9)	1.6 (0.7–2.4)	20.1 (17.4–22.8)
Occupation				
Employed	11.9 (10.4–13.4)	12.5 (11.0–14.0)	4.5 (3.6–5.4)	20.7 (18.8–22.5)
Students	12.5 (10.1–15.0)	13.1 (10.6–15.7)	1.7 (0.5–2.8)	21.2 (18.1–24.3)
Retired	13.2 (7.7–18.7)	10.8 (5.7–15.9)	0.9 (0.0–2.7)	19.1 (12.5–25.7)
Housewives	19.6 (17.9–21.4)	16.7 (15.1–18.3)	0.4 (0.2–0.7)	25.9 (24.0–27.8)
Unemployed	23.0 (19.1–26.9)	19.1 (15.8–22.4)	6.9 (4.5–9.3)	33.0 (28.9–37.2)
Residence				
Urban	15.7 (14.4–17.0)	15.4 (14.1–16.7)	2.9 (2.3–3.5)	24.2 (22.7–25.8)
Rural	15.4 (13.8–17.0)	12.5 (11.1–14.0)	2.7 (2.0–3.3)	22.1 (20.3–23.9)
Socio-economic status				
Low	19.8 (17.6–22.0)	16.8 (14.7–19.0)	5.0 (3.7–6.3)	28.7 (26.1–31.2)
Moderate	15.8 (14.2–17.4)	14.5 (13.0–16.0)	2.3 (1.6–3.0)	23.6 (21.8–25.5)
High	12.8 (11.2–14.4)	13.3 (11.7–14.9)	2.3 (1.5–3.1)	20.8 (18.9–22.8)

IranMHS = Iranian Mental Health Survey; CI = confidence Interval. [a]Major categories Included: Alcohol, opioid, cannabis, stimulants, hallucinogens, and inhalants.

Table 3. Severity proportion of 12- month psychiatric disorders in the IranMHS (N = 7886).

	Severity[a], % (95% CI)		
Psychiatric disorders	**Serious**	**Moderate**	**Mild**
Any anxiety disorder	30.6 (27.3–33.9)	30.1 (27.0–33.3)	39.3 (35.8–42.7)
Any mood disorder	36.0 (32.7–39.4)	33.9 (30.5–37.2)	30.1 (26.8–33.3)
Any substance use disorder [b]	80.6 (73.6–87.7)	7.5 (2.5–12.5)	11.9 (6.2–17.6)
Any primary psychotic disorder	100[c]	—	—
Any psychiatric disorder	34.3 (31.6–36.9)	29.5 (27.0–32.1)	36.2 (33.6–38.8)

IranMHS = Iranian Mental Health Survey; CI = confidence interval. [a] Percentages shown in each row are proportions of the cases in each group of severity and the total is equal to 100%. [b]Major categories Included: Alcohol, opioid, cannabis, stimulants, hallucinogens, and inhalants. [C]By definition, any psychotic disorder was considered a severe illness.

Table 4. Socio-demographic correlates of 12-month prevalence of any psychiatric disorder in the IranMHS (N=7886).

Socio-demographic characteristics	Any psychiatric disorder	
	Unadjusted OR (95% CI)	**Adjusted OR[a] (95% CI)**
Gender		
Male	1	1
Female	1.38 (1.21–1.57)	1.47 (1.21–1.78)
Age groups		
19–15	1	1
29–20	1.20 (0.97–1.47)	1.27 (0.98–1.65)
39–30	1.15 (0.93–1.42)	1.19 (0.89–1.60)
49–40	1.19 (0.95–1.50)	1.21 (0.89–1.66)
59–50	1.12 (0.86–1.49)	1.08 (0.75–1.56)
64–60	0.85 (0.55–1.33)	0.75 (0.43–1.30)
Marital status		
Never married	1	1
Married	1.03 (0.89–1.19)	1.07 (0.87–1.30)
Previously married	1.91 (1.42–2.57)	1.77 (1.25–2.51)
Education		
Illiterate	1	1
Primary	097 (0.75–1.25)	0.97 (0.74–1.26)
Secondary	0.93 (0.71–1.22)	1.02 (0.75–1.38)
High school	0.85 (0.67–1.08)	0.93 (0.70–1.23)
University	0.70 (0.53–0.92)	0.65 (0.50–1.00)
Occupation		
Employed	1	1
Students	1.03 (0.83–1.27)	1.00 (0.77–1.31)
Retired	0.91 (0.58–1.41)	1.10 (0.66–1.81)
Homemakers	1.34 (1.16–1.55)	0.90 (0.73–1.11)
Unemployed	1.89 (1.52–2.36)	1.81 (1.43–2.30)
Residence		
Urban	1	1
Rural	0.89 (0.77–1.02)	0.71 (0.60–0.83)
Socio-economic status		
Low	1	1
Middle	0.78 (0.66–0.90)	0.74 (0.62–0.87)
High	0.65 (0.55–0.78)	0.64 (0.52–0.78)

IranMHS = Iranian Mental Health Survey; CI = confidence Interval; OR = odds ratio. [a] Adjusted for age, sex, marital status, occupation, education, place of residence and socio-economic status.

those who were never married (aOR = 1.77), and the unemployed (aOR = 1.81). In contrast, individuals with a university education had a lower odds of meeting the criteria for a psychiatric disorder compared to illiterate individuals (aOR = 0.65), as did those residing in rural areas compared to city-dwellers (aOR = 0.71), and individuals in middle or upper socio-economic classes compared to the lower class (aOR = 0.78 and 0.65, respectively).

Discussion

The IranMHS aimed to build upon and improve the methodology of previous national surveys in the country.[3,4] We used a reliable and valid translation of an internationally well-known and widely-used instrument (i.e., CIDI) for ascertainment of psychiatric disorders that has been widely used in numerous international studies. The reliability and validity of the locally-adapted in-

strument was rigorously assessed.[10] Further, we employed local mental health professionals with clinical experience instead of lay interviewers. We designed and implemented a strict and comprehensive quality assurance protocol. Unlike some previous surveys in this setting, in which participants were selected for full interview based on the results of a screening, all participants received the full interview. The response rate was high enough to minimize bias. However, we cannot preclude the existence of a systematic survey non-response that could lead to biases in our estimates of disorder prevalence.

The results of the survey suggest that almost one out of every four Iranians in the 15–64 years age range experiences one or more psychiatric disorders in a 12-month period and almost one out of every seven, experiences a psychiatric disorder associated with severe to moderate disability. The estimate is one of the highest compared with some other nationwide studies using this or other versions of the CIDI. For example, the World Mental Health (WMH) surveys conducted in several European, African and Asian countries in 2001–2003 reported estimates varying from 4.3% in Shanghai, China to 26.4% in the US, with an interquartile range (IQR) of 9.1% to 16.9%.[15] Among studies using CIDI versions 2.1 and older, Bijl and Ravelli (2000) reported a 12-month prevalence of 23.5% in the Netherlands and Henderson, et al., (2000) reported a 17.7% estimate in Australia.[23,24] Two studies applying similar methodologies have been conducted in the Middle East, in Lebanon and Iraq, reporting a 12-month prevalence of 16.9% and 13.6%, respectively.[25,26] Our estimate is also higher than two previous national surveys and several local population-based studies in Iran.[3,4,27] However, comparison of prevalence estimates from different surveys is difficult as such estimates are highly dependent on sampling method, instruments used to ascertain disorders, and definition of psychiatric disorders. For example, in another survey of the Iranian population, Noorbala and colleagues[3,4] reported a 21% prevalence of psychiatric disorders using a screening instrument (General Health Questionnaire; GHQ-28), whereas, Mohammadi and colleagues[3,4] reported a 12-month prevalence of 10.8% using the Schedule for Affective Disorders and Schizophrenia (SADS). Comparisons can only be reliably made across surveys which use the same sampling methods and instruments. In the absence of such surveys conducted over time in this setting, we cannot examine trends in prevalence of disorders, either. Nevertheless, it is noteworthy that our estimate is higher than the median prevalence of all surveys that have used diagnostic instruments (18.6%) as reported in a systematic review of prevalence studies in Iran.[27]

The relatively high prevalence estimate of mental disorders in the country calls for immediate response with regard to mental health policy and program planning in the country. Despite some progress in recent decades, mental health services have not yet been optimally developed in the Iran, and there is still insufficient number of qualified mental health professionals in the country. Based on the latest available data[28] only 1.49 psychiatrists and 2.19 psychologists per 100,000 population work in the mental health sector and most of them work in large cities.

Higher prevalence among the unemployed, urban residents, and those with lower socio-economic status is consistent with the result of other studies across the globe.[27,29,30] The preponderance of female gender among those with a mental disorder is in keeping with other studies in and outside Iran [15,27,29]. Social position, poverty, violence and childbearing and reproductive events and problems in access to health care are among the factors that can predispose women to poor mental health.[31–33] However, unlike studies in other settings,[29] we did not observe a significant difference between those currently married and the never married. Our finding replicates many previous studies in Iran [e.g. Noorbala, 2004[3]]. One possible explanation, is that the great majority of single individuals in the country live with their parents until getting married, and therefore may not experience the stressors of independent living, whereas married individuals and especially married women face a number of social and economic stressors commonly associated with psychiatric disorders.

The current study shows that anxiety disorders comprise the most common category of mental disorders. This finding is consistent with findings from a number of other countries surveyed as part of the World Mental Health surveys (WMH).[15] However, our estimate for this category of mental illness (15.6%) surpasses all estimates in these countries with the exception of the United States (18.2%). Other nationally representative studies in Canada and the US (NCS-R) that have used CIDI.2 version reported estimates equal to 12% and 17.2%, respectively.[34,35] If we were to add simple phobias to our assessment, then we could expect even higher rates.

In contrast, the prevalence of depressive disorders was markedly higher in Iran than in many other countries.[36] In the WMH surveys, the average 12-month prevalence of major depressive disorder was 5.5% in 10 high income countries and 5.9% in eight low to middle income countries with the highest reported prevalence being 10.6% in Brazil.[36] A systematic review of prevalence studies carried out before 2004 in different parts of Iran estimated the pooled mean prevalence of 4.1% for studies that have used diagnostic interviews.[37] The prevalence estimate in our study was three times higher than this number and suggests that there might have been an increase in prevalence of depression in the country between early 2000s and 2011 when our study was conducted. Although currently debated,[38] there is some evidence of incremental trend in depressive disorders in recent years in at least some countries (e.g., Denmark, Australia and Canada).[39–41] The possibility of an increasing trend in Iran is also supported by other evidence from surveys conducted in Tehran showing increasing levels of psychological distress, including depression, in recent years.[42] The age structure of the Iranian population with the preponderance of the youth can not explain this finding, as we did not observe different prevalence estimates between the young and the middle age groups. Nevertheless, this unexpectedly high prevalence estimate highlights the burden of depression in the country and demands urgent action to tackle the problem.

Our survey was the first national household survey on substance use disorders in Iran. The estimates, however, should be viewed with caution as assessments based on self-report might grossly underestimate the extent of substance use disorder due to social stigma and legal ramifications. Nevertheless, it is noteworthy that 2.8% of the population reported substance abuse or dependence, which is higher than the 75th percentile of estimates (2.6%) from other countries in the WMH initiatives.[15]

The 12-month prevalence of psychotic illnesses in this population was 0.50%, which is comparable to the prevalence estimate reported by Saha, et al., from their systematic review of previous prevalence studies[43] showing that that the median period prevalence of schizophrenia is equal to 0.33. If we had access to national health registries or databases of the institutional popu-

lation, which is currently non-existent in the country, or had we interviewed a sample of screen negative subjects, the prevalence estimate would be higher than what we obtained.

Determining the severity of psychiatric disorder has important implications with regard to estimating the societal burden of these disorders and allocation of scarce health resources. Almost a third of subjects with any form of psychiatric illnesses could be allocated to each of our three categories of severity. Our findings are comparable to findings from other countries as included in the WMH surveys, considering that our severity criterion was similar to the one used in those surveys. Serious illnesses accounted for almost a third of all cases of psychiatric disorders in many countries; however, the estimates ranged from 8.9% in Nigeria to 30.3% in Mexico.[15]

Comment

Any interpretation of the results of this study should take its limitations into account. First, our study had two major problems inherent in many cross-sectional household surveys, namely, the retrospective nature of queries and the exclusion of institutionalized or homeless people. The latter may not highly impact prevalent disorders, but it might affect less common illnesses such as psychotic and substance use disorders which are more likely to be associated with institutionalization. Second, there may have been underestimations in the prevalence of highly sensitive issues such as substance use disorders that may be an issue, especially in household surveys. Use and possession of alcohol and other substances are strictly punishable by law in the country and it is quite likely that a group of participants might not have reported their use. Third, CIDI is not a clinician-administered diagnostic interview and is not suitable for a comprehensive assessment required for diagnostic decision making. Nonetheless, we employed interviewers with past training in psychology and some degree of clinical experience instead of "lay interviewers". In addition, a validation study has shown that the Persian translation administered by the same group yields reliable and valid diagnoses.[5,10] Fourth, the diagnostic assessments relied on the 2nd version of the CIDI. We were unable to use the 3rd version of the CIDI (WMH-CIDI) at the time of the survey planning. However, the 2nd version is a widely used instrument in previous population surveys,[44,45] and we have used a reliable and valid translation of the instrument. And finally, we did not include disorders such as simple phobias, eating disorders or sleep disorders. This decision was merely made in order to shorten the interview time, bearing in mind that these disorders were assumed to impose a lower burden of disease.

In conclusion, the IranMHS found a relatively high prevalence of mental disorders in the country with more than two thirds of people having a psychiatric disorder belonging to moderate or severe categories. Like many other lower and middle income countries, the share of Iranian health care budget and resources allocated to management of these conditions is far less than would be appropriate given their social burden.[46] The findings call for allocation of greater financial and human resources to the care of these disorders in the country. These efforts should be coupled with increased funding for research on the etiology and treatment of these conditions and efforts to improve access to care and reduce the social stigma of psychiatric illness. Continued monitoring of the mental health status of the country in future years could provide a gauge for the success of these efforts.

Authors' contributions

All authors were involved in study conceptualization, design, training of the interviewers, quality control and interpretation of the results. A. Rahimi-Movaghar was responsible for the overall management of the IranMHS. Statistical analyses were performed by A. Motevalian. V. Sharifi, M. Amin-Esmaeili and A. Hajebi drafted the manuscript. All authors contributed to the final version of the article.

All authors had full access to all of the data in the study. Dr. M. Amin-Esmaeili and Dr. A. Motevalian take responsibility for the integrity of the data and the accuracy of the data analysis.

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Conflict of interest

The authors have no conflicts of interests.

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