Prevalence of Psychiatric Disorders in Iran: A Systematic Review

Ali Farhoudian , MD[1]
Vandad Sharifi, MD[2,3]
Homayoun Amini, MD[2,3]
Anahita Basirnia, MD[2,3]
Bita Mesgarpour, PharmD[3]
Naghmeh Mansouri, MSc[4]
Masoomeh Amin-Esmaeeli, MD[5]
Niloofar Salesian, MD[6]
Mohmmad Reza Mohammadi, MD[2,3]
Reza Yousefi-Nooraie, MD[7,8]
Afarin Rahimi-Movaghar, MD [5]

1 Iranian Research Center for Substance Abuse and Dependence, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran
2 Department of Psychiatry, Tehran University of Medical Sciences, Tehran, Iran
3 Psychiatry and Psychology Research Center, Tehran University of Medical Sciences, Tehran, Iran
4 Mental Health Research Center, Iran University of Medical Sciences, Tehran, Iran
5 Iranian Research Center for HIV/AIDS (IRCHA), Tehran University of Medical Sciences, Tehran, Iran
6 Mental Health ACT, Canberra, Australia
7 Center for Academic and Health Policy, Tehran University of Medical Sciences, Tehran, Iran
8 Health Research Methodology Graduate Program, Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, Ontario, Canada

Corresponding author:
Vandad Sharifi, MD,
Assistant Professor of Psychiatry, Roozbeh Hospital, Tehran, Iran
No. 669, South Karegar Ave., Tehran 1333795914, Iran .
Tel: +98-21-55412222
Fax: +98-21-55419113
Email: vsharifi@tums.ac.ir

Objective: Taking the diversity of the methodologies applied in prevalence studies of psychiatric disorders in Iran and their heterogeneous results into consideration, there seems to be need for a systematic review in order to compile the findings and seek appropriate recommendations for future studies. This study aims at systematically identifying studies conducted in Iran describing the prevalence of psychiatric disorders in general population, and to summarize the findings of these studies.
Method: To identify the relevant studies, several databases including Pubmed Medline, ISI Web of Science, PsychINFO, CINAHL, EMBASE, Irandoc, IranPsych, IranMedex, Scientific Information Database as well as reference lists of the accessed documents, unpublished reports, conference proceedings and dissertations were searched. In the next step, the original studies which contained an estimation of prevalence of "any psychiatric disorder" (overall prevalence) among a sample of general population in the country were selected. This was followed by data extraction, presentation of the results, quality assessment and quantitative pooling of estimated rates of prevalence of psychiatric disorders.
Results: A total number of 35 studies were included. Estimations provided for prevalence rates in different groups illustrate diversity and heterogeneity; the rates varied in the range of 1.9-58.8%. Most of the studies had assessed the point prevalence of the disorders conducted using screening instruments. The median point prevalence has been reported to be 28.70% in screening studies, and 18.60% in studies using diagnostic interviews. Pooled estimates obtained through meta-analysis for screening and diagnostic studies were 29.1% and 21.9%, respectively. The results of the studies which have used diagnostic interviews as their data collection tool showed less heterogeneity than the ones using screening instruments. In quality assessment of the studies, only one third proved to be of high quality.
Conclusion: Even though the pooled rates for prevalence of psychiatric disorders are comparable to the rates in many other countries, the most important finding of this study is the diversity of the prevalence rates among different communities in Iran. This diversity does not seem to be attributed solely to the different time frames and geographical locations of the studies. It might also have resulted from differences in methodologies (e.g., using different tools), study procedures and study quality.

Keywords: *Iran, Mental health, Meta-Analysis, Prevalence, Psychiatry, Review*

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Psychiatric disorders are amongst the most prevalent and disabling illnesses; nearly 450 million individuals are suffering from mental disorders worldwide (1). Statistics provided from different countries reflect the fact that five out of the top burdensome health problems are related to psychiatric disorders (2). In Iran, psychiatric disorders rank second on the list of burden of disease after unintentional accidents (3).
In order to get knowledge of the mental health status of a population, most of the countries have tended to conduct epidemiological studies and repeat them in intervals. So far, several surveys have been conducted on national and international levels across the globe; the most well known of these studies are National

Comorbidity Survey (NCS) and Epidemiolgic Catchment Area study (ECA) (4-7). Similar studies have also been conducted which have mainly utilized DSM-IV based clinical interview diagnostic tools (8-16). Among the surveys assessing the prevalence of mental disorders in general population, the World Mental Health Survey can be pointed out that has been conducted in 14 countries between 2001 and 2003 (17)The WHO World Mental Health Survey Consortium, 2004). In European countries, the European Study of the Epidemiology of Mental Disorders (ESEMeD) has been conducted using the Composite International Diagnostic Interview (CIDI) (18,19). These large scale studies have been quite expensive and the data achieved through them illustrate the difference in prevalence rates in different geographical locations as well as different time frames.
So far, there have been several studies conducted in some parts of Iran with at least two nationwide studies. But a preliminary review of these studies shows clearly that the researchers have utilized different assessment tools in different populations and time frames and have reported different rates; even the two national studies have reported different rates ranging from 10.8% (20) to 21% (21) for prevalence of mental disorders. Ehsanmanesh, has reviewed 29 studies in a narrative review and concluded that there have been a number of different prevalence rates(22). The existing differences in the studies may have their roots in utilization of different assessment tools, diversity of methodologies, and the existing differences among the populations studied considering their socio-economic status.
There is a growing appreciation that reviews should be based on data that are as complete and as free of bias as possible, and for this purpose, systematic reviews have prespecified methods for locating studies and for extracting and synthesizing the data (23). To date, limited systematic reviews have been conducted to study the prevalence of psychiatric disorders in other countries. Studies conducted by Mirza et al and Waraich et al can be pointed out as examples(24,25). There have been systematic reviews on specific disorders or populations; for instance, the study on prevalence and incidence of schizophrenia (23,26), prevalence of severe mental disorders among migrants (27), prevalence of depression and anxiety symptoms among the widow (28), prevalence of Attention Deficit Hyperactivity Disorder (ADHD) in general population of students aging 18 and younger (29), prevalence of Post-traumatic Stress Disorder (PTSD) in children suffering from cancer and their parents (30), prevalence of anxiety, depression, and other indicators of psychological distress among American and Canadian medical students (31), and prevalence of schizophrenia among the homeless (32). However, we did not come across a systematic review on the prevalence of "any psychiatric disorders" or "overall prevalence" in a country. This measure indicates the proportion of the population that has at least one psychiatric disorder. Knowledge of this measure is of utmost importance in policy making and planning for mental health services provision.
Despite its significance, there is still considerable diversity in the information available regarding the prevalence of psychiatric disorders in Iran. As a consequence, it is essential to explain the existing differences; for instance, we must clarify the extent to which these differences stem from demographic, temporal, methodological, and other characteristics of the studies. Taking the previous estimates into consideration, we must also provide a pooled estimate of the prevalence of mental disorders. Performing a systematic review is the best way available to review the rates provided by different studies already conducted, and assess the existing differences. This study aims at reviewing systematically the existing studies on prevalence of psychiatric disorders among Iranian population over 15 years old.

Materials and Method

Study selection

Studies were included if they were original and provided estimates of prevalence of "any psychiatric disorder" in general population. This includes: A) prevalence of a probable disorder which is usually assessed by screening tools such as General Health Questionnaire (GHQ) or Symptom Checklist-90 (SCL-90) which provide the point prevalence of probable disorders or suspected psychiatric illnesses; and B) prevalence of disorders based on the diagnostic criteria (DSM or ICD) which is mainly provided by use of diagnostic tools. The diagnostic instruments may include CIDI, Schedule for Affective Disorders and Schizophrenia (SADS), or Structured Clinical Interview for DSM-IV (SCID) among others. Prevalence can either be rated as "point prevalence" or "life-time prevalence": Point prevalence is the proportion of individuals who manifest a disorder at a given point in time (e.g., 1 day to 1 month). Lifetime prevalence is the proportion of individuals in the population who have ever manifested a disorder, either in the past or present time.
Studies were excluded if they were not primary studies such as reviews, studies conducted on specific population subgroups such as immigrants, university students, prisoners, or individuals referring to medical treatment centers, as well as studies conducted to follow up the services and treatments provided to specific groups, studies aiming at genetic assessment of the relatives of patients suffering from specific disorders, or studies restricted to assessment of the disorders related to drug abuse and dependence, personality disorders, and mental retardation. In case we encountered studies in which there was overlap of the sample (such as the cases where a major study had been divided to some smaller ones to be published), the most comprehensive report was reviewed.
The primary goal of the search included getting access to all the original studies which had provided primary data and estimated the prevalence of "any psychiatric

disorder" by the end of 2006. Search was conducted through different methods:

Electronic search

Medline (Pubmed interface), ISI Web of Science, PsychINFO, CINAHL, EMBASE as well as Iranian databases including IranPsych (iranpsych.tums.ac.ir), IranMedex (www.iranmedex.com), Irandoc (www.irandoc.ac.ir), Scientific Information Database (www.sid.ir) were searched through. IranPsych is a national database for mental health research that includes all Iranian research papers and dissertations at bachelor or higher levels in the fields of neuroscience, psychology, psychiatry, and socio-cultural science related to mental health. IranMedex is a database for published papers in medicine as well as related fields in Iranian journals since 1982. Scientific Information Database (SID) provides the possibility of searching and getting access to the abstract and the full-texts of papers of national scientific and research journals in the fields of medicine, human sciences, basic sciences, agriculture, art, and architecture. Search strategy included the combination of the following search strategies:

#1. Latin transcription of Iran and its major cities having a medical school, the names of the universities, and specific psychiatric hospitals (for international databases);

#2. Phrases related to epidemiology and prevalence estimation;

#3. Commonly used instruments in mental health prevalence studies (such as CIDI); and

#4. Phrases related to mental disorders.

The combination was as follows: #1 AND (#2 OR #3) AND #4. All the searches were conducted in the last months of the year 2006 to obtain studies published by that time (For more details see Appendix 1).

Other search methods

In addition to searching the databases, the reference lists of the papers or reports accessed through the search as well as the lists of the contents of Iranian psychiatry, psychology and mental health journals were hand-searched. In addition, proceedings of psychiatry, psychology, and epidemiology conferences held in Iran by the time of the study were reviewed. In order to get access to the medical doctorate or psychology dissertations and theses, IranPsych database was searched. At the same time, correspondence to Mental Health Office at the Ministry of Health and Medical Education was made to get access to the existing reports of epidemiological research projects. Meanwhile, all the editors of Iranian psychiatry and mental health journals were contacted either directly or through correspondence so that the "in print" list and the names of the authors were accessed. Finally, opportunistic methods were utilized to discover other existing studies. Any of the researchers who had information regarding studies, introduced them and the research team tried to get access to the study.

After the search was performed, the titles were reviewed so that the decision was made whether they were eligible according to the inclusion criteria. In case the title was considered related to the study, the abstract was referred to two researchers. In the event that at least one of the researchers considered a study appropriate to be included or felt uncertainty about inclusion of the study, it was included at this phase. The English and Persian texts of the papers were reviewed as they were. In case we could not get access the full-text, the author was contacted to ask for the full-text of the document.

The full–texts of the relevant documents went through a preliminary review by two of the researchers. In case any of these researchers was uncertain whether the study had the inclusion criteria, it was first discussed between the two and a third member was consulted if consensus was not achieved. Afterwards, each of the two researchers independently assessed the quality of the studies based on a checklist that included quality indicators about the hypothesis of the research, sampling, measurement, and data analysis. However, no study was excluded based on the quality rating. For the purpose of this review, studies were considered to be of high quality if they had a random sample representing the target population and at the same time used valid and reliable data collection tools. The results of the qualitative assessment of the reports are discussed in detail elsewhere (Sharifi et al., submitted for publication).

Data extraction

Two authors independently performed data extraction from each study. The extracted information included prevalence estimate of "any psychiatric disorder" among men, women, and total sample (along with confidence intervals and standard errors); study time frame; study location and the geographical extent of data collection; data collection tools and methods (questionnaire, face-to-face diagnostic interview or checklists, psychometric properties of the instruments); and sample characteristics. Prevalence rates were classified as life-time or point prevalence in one hand and obtained through diagnostic interview or screening (probable disorder) on the other. In the event that the two researchers' opinions differed on data extraction of any of the studies, they first tried to reach consensus through discussion; then they consulted the corresponding author if they could not overcome the disagreement. All the information was entered in the forms which had been designed for this purpose.

Data Presentation and Analyses

Data were entered into SPSS (version 14) and Stata (version 8) for data analysis. The extracted data of the included studies are shown in the evidence tables (Tables 1 to 3); each column depicts the main characteristics of the study. The distributions of prevalence estimates are presented in cumulative plots, with every estimate contributing to the distribution.

The distribution of the data is shown in ascending order for prevalence estimate with the cumulative percent of estimates shown on the horizontal axis. The plots show vertical reference lines indicating the 50% (median), and 25% and 75% quantiles (between which lies the interquartile range). Key features of these distributions are presented in Table 4 (e.g., median, mean, standard deviation, and quantiles at 10%, 25%, 50%, 75%, and 90%).

Despite the observed heterogeneity in survey methods, instruments, analysis and presentation, we decided to use a meta-analytic technique to combine the data. Our rationale was that meta-analytic techniques could provide us with pooled estimates that are at least as useful as central tendency measures such as median. In order to do that, the statistical program Stata was applied throughout to produce the random effects estimates of the pooled rates for all studies together, along with confidence intervals (Table 4). The command 'meta' was used for all analyses. Moreover, the distribution of prevalence estimates of studies have been provided in forest plots using random effects model.

Results

As shown in Figure 1, 35 studies were eventually included in the study that reported 42 prevalence rates for "any psychiatric disorder" or "overall prevalence" in Iran (33-68). Out of these 35 studies, 23 were journal articles, 8 were dissertations, and 4 were research reports. Of the 35 studies, 33 reported point prevalence of mental disorders, of which 18 had been conducted through screening instruments while 22 had used both screening and diagnostic clinical interviews as their tools. In the latter group, twenty-one have been conducted through a two-stage design; i.e., in the first stage the individuals were screened by use of a screening tool (such as SCL-90 or GHQ) and those highly suspected of suffering from a mental disorder based on the screening entered the second stage which consisted of a diagnostic clinical interview. Only one study was merely based on clinical interview. It must be noted that most of the studies had assessed the point prevalence of the disorders in the most recent week or month. Life-time prevalence rates had only been assessed by 2 studies which were based on diagnostic interviews. Thirteen studies had been conducted in urban and 13 in rural areas. Five studies had included both urban and rural areas. Two studies had been conducted on provincial level while two others were nation-wide studies. Most studies (32, 91.4%) were conducted either in 1990s or 2000s .

Among the 18 reports which had assessed the sample by use of screening tools, 10 had used SCL-90 as their data collection tool while the remaining 8 had used GHQ. Of the reports which had estimated the prevalence of mental disorders using clinical interviews, 9 had not mentioned the name of the interview tool, 8 had used clinical interview checklist, and 5 had used Davidian's Clinical Interview Checklist, Mohammadi's Clinical Interview Checklist, Noorbala's Clinical Interview Checklist, and CIDI.

Quality assessment evaluation of the studies showed that only 46.9% of the studies the sample population adequately represented the general population; namely, the response rate was reported to be adequate and distribution of the demographics of the sample resembled the general population. Majority of the studies had used tools with adequate reliability and validity but in almost 25% of the studies, reliability and validity of the Persian version had not been assessed. Overall, close to a third (14 of the studies) were of high quality (10 papers, 3 dissertations, and one research project). Details of the quality assessments are reported elsewhere (Sharifi et al., submitted for publication).

Figures 2 and 3 show the forest plots depicting prevalence rates of the studies that had used screening instruments and diagnostic interviews, respectively. It is obvious that the rates provided by different studies have a wide range and the heterogeneity test has proved significant. However, it seems that prevalence rates of diagnostic studies have a narrower distribution in comparison to the studies which have provided the prevalence of mental disorders based on screening tools. Figures 4 and 5 illustrate the cumulative plots of the screening and diagnostic studies, respectively.

Only 2 studies have assessed the life-time prevalence of mental disorders using two different tools and have reported significantly different results (10.80% vs 30.9%). The first one is a national and the other is a multi-provincial. Because of the very small number of the studies, we did not draw any plot.

Table 4 shows the descriptive statistics for the prevalence rate of mental disorders among general population over 15 years as well as populations of men and women. In addition we have calculated the pooled estimates through meta-analysis that, as shown in the Table, are very close to the medians. The median point prevalence was 29.30% for the screening studies and 18.60% for the diagnostic studies. The median for the point prevalence among women was higher than the median for men based on screening (33.80% vs. 23.00%) as well as diagnostic interviews (26.54% vs. 14.90%). The median life-time prevalence was equal to 30.9%.

Discussion

This is the first systematic review of the prevalence of mental disorders in Iran. Meanwhile, as far as we know, this is also the first published study of its own type. Even though there have already been systematic reviews for specific disorders (23-26), we have not encountered any systematic review in which prevalence of "any psychiatric disorder" in general population has been considered .

It is fortunate to see that a significant number of prevalence studies have been conducted in Iran and most of them are published in scientific journals.

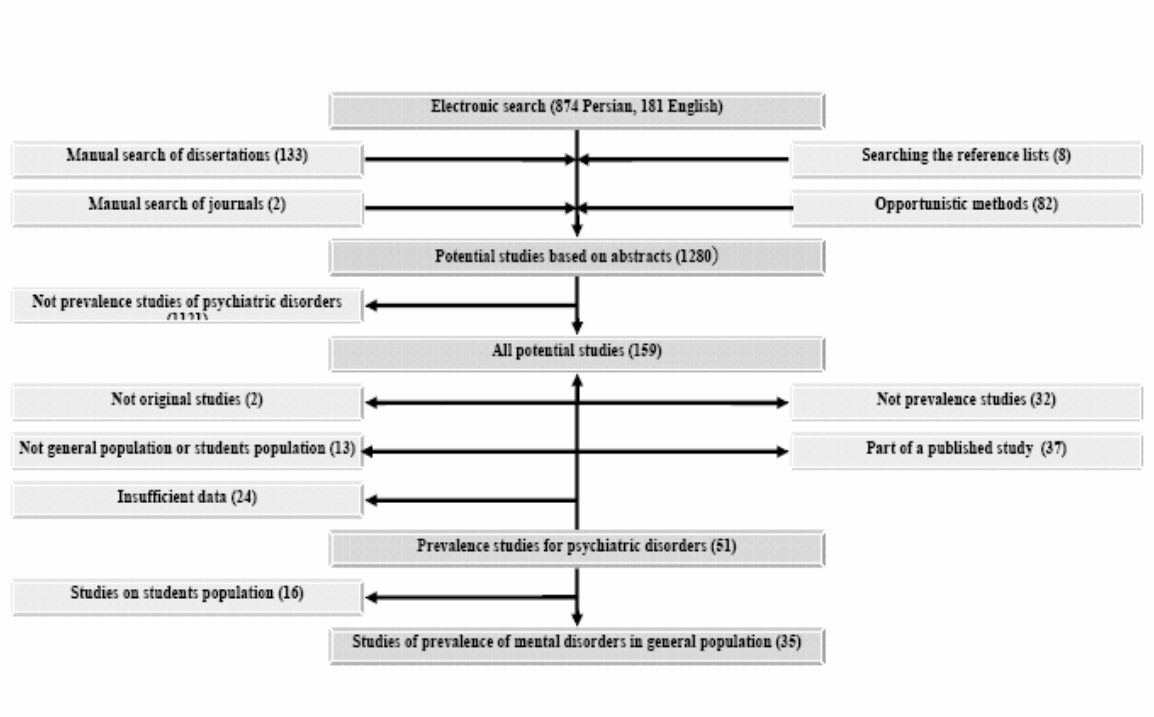

Figure 1- Flowchart of study selection

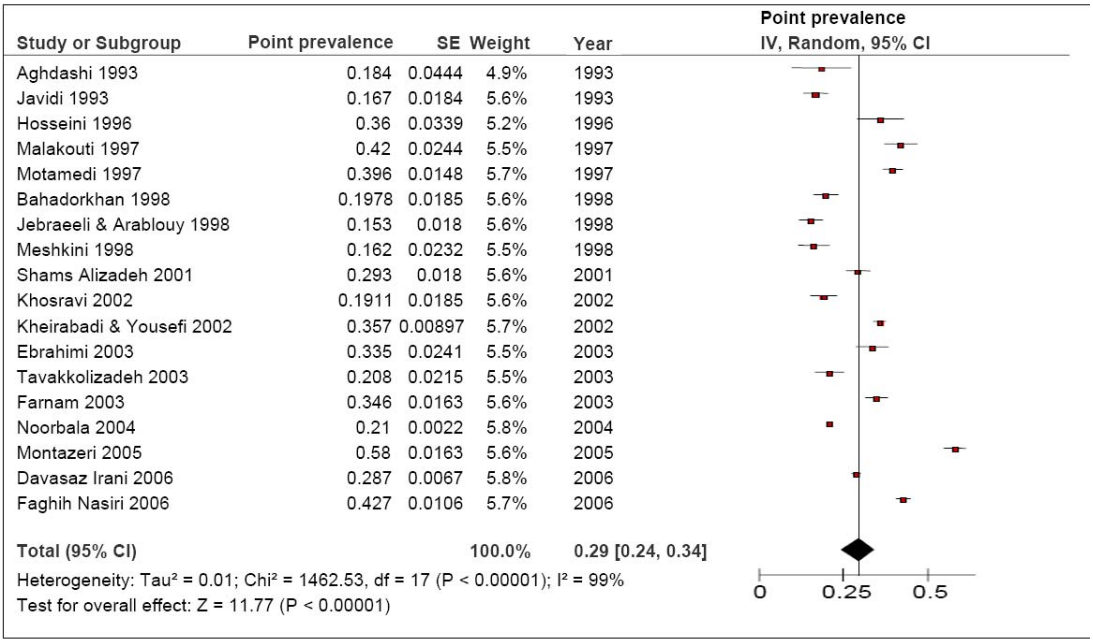

Figure 2. Forest plots of point prevalence of mental disorders based on screening of Iranian general population over 15 years old

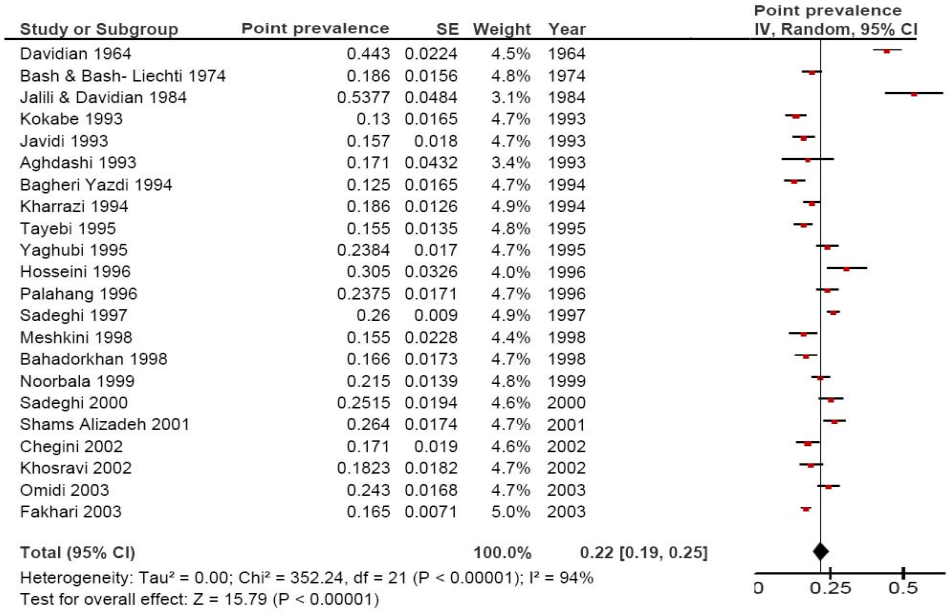

Figure 3. Forest plot of point prevalence of mental disorders based on clinical interview among Iranian general population over 15 years old

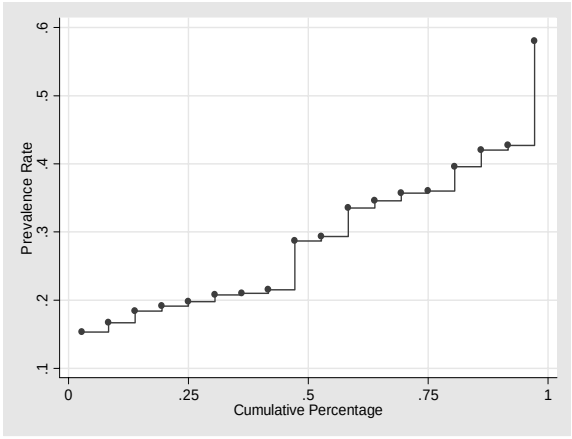

Figure 4. Cumulative plot of point prevalence of mental disorders based on screening of Iranian general population over 15 years old

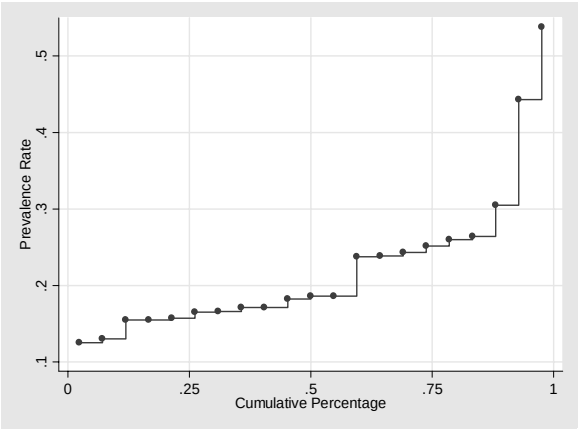

Figure 5. Cumulative plot of point prevalence of mental disorders based on diagnostic clinical interview among general population over 15 years old

However, looking at the studies together draws our attention to some features of psychiatric epidemiological research in the country that is discussed in the following paragraphs **.**

The median point prevalence based on screening was 28.70%, the median point prevalence based on diagnostic interview was 18.60%, and the median for life-time prevalence was 20.85%. Comparison of the forest plot of prevalence of psychiatric disorders based on screening and the prevalence rates based on diagnostic interview shows that distribution, heterogeneity, and wide range of prevalence reported in screening studies might be an illustration of inappropriateness of the screening tools, incomparability of different assessment tools, or their cut-offs. The median point prevalence in screening studies obtained through the present review is comparable to the results of the Noorbala's national study (47,48) which has been the basis for many national decision-makings (28.70 and 21%, respectively); however, it should be noted that Noorbala's study has had an influential impact in our results because of the very high number of its sample population. A study by Montazeri et al (49) has reported a very high rate of prevalence and is somehow an outlier as observed in the forest plot (Figure 2). This could be related to the fact that it was conducted in the aftermath of Bam earthquake when high prevalence of psychiatric morbidity is not unexpected **.**

This study showed that the assessment tools used in Iranian studies to determine the prevalence rates resemble the tools most commonly used in other parts of the world. Most of the studies worldwide have also used SCL-90 and GHQ for screening of mental disorders (69). Meanwhile, as observed in comparison

of the results of the two assessment tools, namely GHQ and SCL-90, some differences in the obtained rates are obvious. An important issue about the screening tools in prevalence studies in Iran is the different cut-offs used in different studies. For instance, in case of SCL-90 cut-offs of 0.4, 0.7, and 0.82 have been considered. It is not clear why different studies use different cut-off points. Even though some of the studies have tried to find out their own cut-off points through validity study, some others have determined the cut-off point with reference to other local or international studies. More interestingly, the results are not related to the cut–off points used. For instance, those with a lower cut-off point have not necessarily reported higher prevalence rates. Apart from the problems which might have happened in some of these studies, as Narrow et al believe, studies based on screening provide higher prevalence rates as a consequence of their high sensitivity, and because of the fact that they consider individuals with mild, self-limited and transient symptoms(70). In case these higher prevalence rates of mental disorders are accepted, the increase of the costs will be inevitable and the health system will have to bear a high load of financial and human resources. The value of the studies with lower than standard qualities is not clear; especially when considering the fact that the nationwide study that has used a screening instrument has constituted the basis for most of the mental health decision makings**.**

The results of the studies of mental disorders' prevalence rates are more homogenous when conducted using diagnostic interviews even though they are heterogeneous in statistical analysis. Except for one study conducted in one of the villages in the vicinity of Yazd (54) in which the prevalence rate is somehow an outlier, majority of the rates reported in other studies are in the range of 15 to 30% with pooled mean of 21.3% that is close to several diagnostic studies in other parts of the world and different from some other important studies. For example, in a national survey in the US, Kessler et al (6,7) have assessed the overall prevalence of any DSM-IV disorders using CIDI and reported the point-prevalence of 26.2%; however, in another study encompassing some European countries, the prevalence rates have been reported to be nearly 11% (18, 19). In a multi-national study conducted under supervision of WHO using a single methodology and assessment tool, the reported rates have been quite diverse (17). This diversity might have resulted from differences in time frames, demographics, and methodologies. Namely, it seems quite acceptable to see different prevalence rates of mental disorders among different populations and in different time frames as disorders are influenced by different risk factors without a homogeneous distribution (23). On the other hand, the diversity of the assessment tools might also result in different prevalence rates estimated; for instance, even standardized and well-known instruments such as SADS and CIDI do not assess a single set of disorders. A single disorder (e.g, somatization disorder or dissociative disorder) might be rated by one tool but not in the others. In contrast to most of the international studies which have mainly used CIDI (5) and then SADS and SCID (69), the Iranian studies have been based on clinical interviews performed by a psychiatrist, and the reliability of such tools have not been mentioned in most of the studies. It should be noted that reliability of clinical interviews performed by psychiatrist is questionable**.**

In case of the diagnostic studies evaluating the prevalence rates of mental disorders among general population, a significant number of studies have been conducted using clinical interviews performed by a psychiatrist, and all of the studies except one have a two-stage design. It seems that the rationale for using a two-stage method has been the convenience and lower costs; as in the second stage only the individuals who were suspected of having an illness were interviewed. Since the screening tools have a high sensitivity, the prevalence rates obtained through these two-stage screening-diagnostic studies, however similar, is not the same as the real rates obtained through a diagnostic study in the population; therefore, the pooled rates of the two-stage studies provided in this systematic review should be regarded with caution**.**

Only two life-time prevalence studies have been conducted (67,68). The first one is a national study conducted using SADS and the other is a multi-provincial study performed by use of CIDI. The studies have provided quite different rates (10.80% vs 30.9%). The time lag between the two studies is not long, and the provinces not included in the second study do not seem to have a significant difference with the provinces included; the existing significant difference might have resulted from different reasons such as different assessment tools, different validity and reliability of the tools, and different data collection methods. Scarcity of the studies of life-time prevalence might have resulted from simplicity and low costs of screening studies and availability of their assessment tools.

A glance to the location of the studies of prevalence of mental disorders shows that only two nation-wide and two provincial studies have been conducted while there have been a lot of smaller scale studies in different urban and rural settings. The issue to be discussed here is whether epidemiological studies have been conducted based on the needs or because of some personal interests or feasibility of the procedures **.**

Some researchers (e.g., Saha et al) question the value of pooled estimates derived from meta-analysis of prevalence studies as they believe that the prevalence of the disorders is influenced by several factors and the prevalence rates estimated at different time frames and in different populations cannot be pooled (23). We have accepted this limitation in this systematic review; and actually the pooled figures achieved have been very close to the descriptive figures derived from the

Table 1. Characteristics of studies conducted on point prevalence of mental disorders based on screening among Iranian general population over 15 years old

Authors	Publication year	Type of document	Target population	Year of the study	Total sample size	Male sample size	Female samlpe size	Response rate	Screening tool	Cut-off	Prevalence-persons	Prevalence-male	Prevalence-female
Javidi	1993	dissertation	Over 15 yrs, 3 regions of Marvdasht village	1993	407	163	244	91%	SCL- 90	0.4	16.70	?[1]	?
Aghdashi	1993	dissertation	Over 15 yrs, a village in the vicinity of Osku	1993	76	?	?	?	SCL-90	?	18.40	?	?
Hosseini	1996	dissertation	15-25 yrs	1996	200	100	100	99%	GHQ	23	36	27	45
Motamedi et al	1997	paper	Over 15 in 2 villages of Baft/ Kerman	1995	1086	434	652	99.5%	SCL- 90	1	39.60	?	?
Malakouti et al	1997	paper	Over 15 years/ Zahedan district	1994	410	199	211	?	SCL-90	0.82	42	?	?
Jebraeeli & Arablouy	1998	dissertation	Over 15 rural areas of Urmia district	1997	400	193	207	?	SCL-90	0.4	15.30	11.39	18.84
Bahadorkhan	1998	dissertation	15 yrs and over/ Gonabad villages	1993	465	194	271	97%	SCL-90	0.4	19.78	?	?
Meshkini	1998	dissertation	Over 15 yrs Osku district	1998	252	105	147	?	SCL-90	?	16.2	?	?
Shams Alizadeh et al	2001	paper	Over 15 yrs Valian village / Tehran province	2000	640	287	353	92%	GHQ	23	29.30	?	?
Kheirabadi & Yousefi	2002	paper	Over 15 yrs urban setting/ Kurdistan	1999	2855	1118	1737	?	GHQ	6	35.70	35.24	35.92
Khosravi	2002	paper	Over 15 yrs, urban & rural setting , Borujen	1994	450	190	260	?	SCL-90	0.4	19.11	?	?
Tavakkolizadeh et al	2003	paper	20-40 yr- old/ Gonabad district	?	356	147	205	89%	GHQ	23	20.80	?	?
Farnam	2003	Final report of research project	Women over 16 , urban setting of Shiraz	2002	854	-	854	?	SCL- 90	?	34.60	-	34.60
Ebrahimi	2003	Final report of research project	15-24 yrs Residents of Zanjan	2001	382	?	?	?	GHQ	23	33.50	?	?
Noorbala et al	2004	paper	15 yrs and older, nation- wide	1999	35014	15506	19508	?	GHQ	6	21	14.90	25.90
Montazeri et al	2005	paper	Survivors of Bam earthquake, 15 yrs & older	2003	916	486	432	92%	GHQ	8.7	58	?	?
Davasaz Irani et al	2006	paper	15 yrs and older, rural setting of Khuzestan province	2004	4513	2080	2433	?	GHQ	6	28.70	23	33
Faghih Nasiri et al	2006	paper	18-65 yrs Abouzar district/ Tehran	2003	2158	1199	959	?	SCL-90	0.7	42.70	?	?

SCL-90: Symptom Checklist-90; GHQ: General Health Questionnaire

Table 2. Characteristics of the studies of point prevalence of mental disorders based on screening and diagnostic interview among general population over 15 years old in Iran

Authors	Publication year	Type of document	Target population	Year of the study	Total sample size	Male sample size	Female sample size	Response rate	tool		Cut off	Prevalence -persons	Prevalence male	Prevalence-female
									Screening	Diagnostic interview				
Davidian et al	1964	paper	16 yrs & older, Roodar district	1961	488	189	299	81%	Davidian's Questionnaire	Clinical interview Checklist	20	33.2	24.30	54.70
Bash & Bash-Liechti	1974	paper	Over 15 yrs, Shiraz city	1995	622	314	308	?	-	Not specified	-	18.64	14.96	22.40
Jalili & Davidian	1984	paper	Over 15 yrs, Deh Zereshk, Yazd	1968	106	55	51	?	other	Not specified	-	53.77	38.18	70.58
Aghadashi	1993	Dissertation	over 15 yrs, a village in the vicinity of Osku	1993	76	?	?	?	SCL- 90	Not specified	?	17.1	?	?
Javidi	1993	Dissertation	Over 15 yrs, 3 rural regions of Marvdasht	1993	407	163	244	?	SCL-90	Clinical Interview Checklist	0.4	15.70	13.6	22.30
Kokabe	1993	Dissertation	Over 15 yrs, rural areas of Azarshahr	1993	415	201	214	98%	SCL-90	Not specified	40%	13	7.46	18.22
Kharrazi et al	1994	Dissertation	Over 15 yrs, urban setting, Yazd	1994	950	?	?	?	SCL-90	Not specified	?	18.60	?	?
Bagheri Yazdi et al	1994	paper	Over 15 yrs, 3 rural setting, meybod	1994	400	196	204	92%	SCL-90	Clinical Interview Checklist	0.4	12.5	6.3	18.8
Yaghubi et al	1995	paper	Over 15 yrs, Someaesara district	1995	625	291	334	95%	GHQ	Checklist	23	23.84	15.80	30.84
Tayebi	1995	Dissertation	Rural population of Shushtar/ central region	1995	724	251	473	?	SCL-90	Not specified	?	15.50	14.60	15.80
Hosseini	1996	Dissertation	15-25 yrs, Taleghan village	1996	200	100	100	?	GHQ	Checklist	23	30.50	22	39
Palahang et al	1996	Paper	15 yrs & older, urban setting of Kashan	?	619	296	323	90%	GHQ	Checklist	Women 21, Men 22	23.75	15.20	31.5
Sadeghi	1997	Final report of research project	15 yrs & older, Kermanshah city	2003	2400	1176	1224	?	SRQ	Checklist	?	26	23.98	27.98
Meshkini	1998	Dissertation	Over 15 yrs, Osku district	1998	252	105	147	?	SCL-90	Not specified	0.4	15.50	2.90	24.5
Bahadorkhan	1998	Dissertation	15 yrs & older, Gonabad village	1993	465	194	271	96%	SCL-90	Clinical Interview Checklist	40%	16.60	12.37	19.55
Noorbala et al	1999	Paper	15 yrs & older, residents of urban areas of Tehran	1999	879	424	455	95.4%	-	Checklist	?	21.50	14.90	27.70
Sadeghi et al	2000	Paper	15 yrs & older, Kermanshah	1998	501	231	270	95%	SRQ	Checklist	5	25.15	16.90	32.20
Shams Alizadeh et al	2001	Paper	Over 15, Valian village in Tehran	2000	640	287	353	94%	GHQ	Checklist	23	26.40	14.70	35.70
Chegini et al	2002	Paper	15 yrs & older, urban & rural residents of Ghom	2000	391	188	203	96%	SCL-90	Not specified	64	17.10	16	18.20

Table 2. Continued...

Khosravi	2002	Paper	Over 15 yrs, urban & rural regoind of Borujen	1994	450	190	260	?	SCL-90	Clinical Interview Checklist	0.4	18.23	8.94	25.38
Omidi et al	2003	Paper	15 yrs & older, Natanz city	2001	650	325	325	?	GHQ	Checklist	Men 22, women 23	24.30	17.20	31.30
Fakhari	2003	Paper	Over 16 yrs, residents of north west of Tabriz	2000	2706	?	?	?	Duke	Not specified	?	16.50	9.56	22.4

SCL-90: Symptom Checklist-90; GHQ: General Health Questionnaire

Table 3. Characteristics of the life-time prevalence studies of mental disorder

Authors	Publication year	Type of document	Target population	Year of the study	Total sample size	Male sample size	Female sample size	Response rate	Tool	Prevalence -persons	Prevalence-male	Prevalence-female
Mohammadi et al	2005	paper	18 yrs & older, nation-wide	2001	25180	12660	12520	90%	SADS	10.80	7.34	14.34
Abhari et al	2003	Final report of research project	18 yrs & older in Lorestan, Khuzestan, Bushehr, Kermanshah, West Azarbaijan, Kerman, and Isfahan	2002	2764	1211	1553	?	CIDI	30.90	?	?

Table 4. Descriptive statistics of prevalence of mental disorders among Iranian general population over 15 years old

Prevalence	Number of studies	percentiles					Meta-analytic Pooled estimate	95% CI
		10%	25%	median	75%	90%		
Point- prevalence studies based on screening (18 studies)								
Total number	18	16.2	19.11	28.7	36.00	42.70	29.1	24.0 -34.1
Men	5	11.39	14.90	23.00	27.00	35.24	22.2	14.3 -30.0
Women	6	18.84	25.90	33.80	35.92	45.00	31.6	26.5 - 36.7
Point- prevalence studies based on diagnostic clinical interviews (22 studies)								
Total number	22	15.50	16.50	18.60	25.15	30.50	21.9	19.2 -24.7
Men	20	6.21	9.25	14.90	17.05	24.14	14.7	11.5 -17.9
Women	20	18.2	20.92	26.54	31.85	46.85	29.1	24.8 - 33.4
Life- time prevalence studies (2 studies) *								
Total number	2	10.80	10.80	20.85	30.90	30.90	20.8	1.1 - 40.5
Men	1	7.34	7.34	7.34	7.34	7.34	7.3	6.9- 7.8
Women	1	14.34	14.34	14.34	14.34	14.34	14.3	13.7- 15.0

* One of the life time prevalence studies has not reported the prevalence rates among women and men separately. Therefore, the mean for the prevalence of the disorders among total population is higher than the means for each of the genders.

mean. In the present study, prevalence of mental disorders in general population based on screening tools has been higher than the point prevalence rates based on clinical interviews that is not surprising.
On the other hand, the prevalence rates have been higher among women as compared to men which are considered as an expected result comparable to the results achieved in the studies conducted in other countries (71).
In quality assessment, we found that most of the studies have used valid and reliable original assessment tools but at the same time, many of the studies have used the translated version of the tools which lacked desirable validity and reliability. The other issue is the instruments used for clinical interview. Many of the studies have used the unstructured clinical interviews conducted by a psychiatrist. As already mentioned, at least the reliability of such an assessment tool is questionable. Even the studies which have used valid instruments, such as SADS and CIDI, have not fully described the psychometric properties of these tools and it is not evident whether these tools have been valid and reliable for all the diagnoses made. Our criteria for a study to be of high quality required that it should use valid and reliable tools (both the original and the translated version) and at the same time the sample should be representative of the general population. Unfortunately, only one third of the studies were considered as high quality studies. On the other hand, the ratio of high quality studies among the studies which were based on screening was much less than the studies conducted using screening together with diagnostic clinical interviews. This finding further reminds the fact the results obtained by the screening studies should be regarded with uncertainty**.**
As already discussed, there is high probability that the wide range of the prevalence rates stem form the different methodologies, study designs, and study procedures. It is recommended that that the researchers should be provided with a guideline for conducting studies on prevalence of mental disorders. The study design, adequate sampling method, using reliable and valid Persian assessment tools, standard training of the researchers and other related issues should be noted in this guideline. This may result in improvement of the quality of the studies. In addition, policy makers and health research authorities should take measures for planning mental health research which can include setting priorities for those prevalence studies that are able to address the unanswered questions and needs and avoid unnecessary repetition of the studies. Moreover, strategies should be employed to overcome the weaknesses of the national prevalence studies and ensure to quality of epidemiological research in psychiatry**.**

Limitations

The most significant limitation of this systematic review stems from the existing incompleteness of the national databases which index the documentations and research resources (journal articles, dissertation, research project, etc). Despite great efforts, there is possibility that some research reports have not been included in the study. Difficulty in contacting the authors of the studies and completing the missing information was another limitation. Calculating pooled estimates for observational studies, as mentioned before, has its own limitations; therefore any conclusions based on this pooled figured should be taken with caution. However, we believe that systematic reviews of prevalence studies bring forward the possibility to go beyond pooling estimates and to attend to the characteristics of the distribution of estimates as well as understanding the variability of study methods and procedures and their strengths and weaknesses**.**

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Appendix 1.

The search strategy was modified according to each database's specifications. In the following paragraphs the strategy used for Pubmed Medline is shown as an example:

#1. Iran* OR Iran[mesh] OR Tehran* OR Babol* OR Tabriz* OR Rasht* OR mashhad* OR Mashad* OR Zahedan* OR Fars* OR Shiraz* OR Fasa* OR Ahvaz* OR jundi shapur OR jundi shapur OR jondishapour OR jund shapour OR shahid OR shaheed OR beheshti OR ferdowsi OR Isfahan* OR Esfahan* OR Yasooj* OR Yasouj* OR Yasuj* OR Arak* OR Qom* Kerman* OR Rafsanjan* OR Bakhtaran* OR Urmia* OR Orumieh* OR Oroomieh* OR Oroumieh* OR Behzisti OR Sari* OR Mazandaran* OR Gilan* OR Guilan* OR Guillan* OR Gillan* OR Semnan* OR Yazd* OR Hormozgan* OR Kohgilooye* OR Kohkilooye* OR Kohgilouye* OR Kohkilouye* OR Kohgiluye* OR Kohkiluye* OR Sanandaj* OR baqiyatallah OR baghiatallah OR baghiatollah OR Qazvin* OR azad OR Sabzevar* OR Ardabil* OR Ardebil* OR Bushehr* OR Booshehr* OR Boushehr* OR modares OR modarres OR Ilam* OR Golestan* OR Gorgan* OR Kordestan* OR Kurdistan* OR Kordistsn* OR Kurdestan* OR Artesh OR Karaj* OR Shahrekord* OR Rafsanjan* OR shahed OR Jahrom* OR Shahroud* OR Shahrud* OR Shahrood* OR Kashan* OR Hamedan* OR Hamadan* OR Zanjan* OR Birjand* OR roozbeh OR imam OR emam OR razi OR Tonekabon* OR Tonkabon* OR Lorestan* OR Najafabad* OR army OR Khoramabad* OR Khorramabad* OR Bandar*

#2. epidemio* OR epidemiology OR prevalence OR risk OR population OR survey OR screening

#3. SADS OR "Schedule for Affective Disorders and Schizophrenia" OR CIDI OR "Composite International Diagnostic Interview" OR SCID OR "Structured Clinical Interview for Diagnostic and Statistical Manual" OR GHQ OR "general health questionnaire" OR SCL-90 OR "Symptom Checklist-90" OR "Symptom Check List" OR "Symptoms Check List-90" OR "Symptom Checklist-90-Revised" OR SRQ OR "Self Reporting Questionnaire" OR "self-reporting questionnaire" OR "Self Rating Questionnaire" OR "Self-report Questionnaire") NOT ("School Relationships Questionnaire" OR "Shoulder Rating Questionnaire" OR "severe combined immunodeficient" OR "Severity of Alcohol Dependence Scale" OR "supraglottic airway devices" OR "sudden arrhythmic death syndrome"

#4. neurosis OR neurotic OR Neurotic Disorders [mesh] OR Mental OR Mental Disorders [mesh] OR Psychos* OR psychot* OR Psychology [mesh] OR depress* OR Depression [mesh] OR Depressive Disorder [mesh] OR psychi* OR Psychiatry [mesh] OR schizoph* OR Schizophrenia OR Schizophrenia [mesh] OR Schizophrenia and Disorders with Psychotic Features [mesh] OR anxie* OR Anxiety Disorders [mesh] OR Obsessive-Compulsive Disorder [mesh] OR obsessi* OR impuls* OR Phobic Disorders [mesh] OR phobi* OR Combat Disorders [mesh] OR mood OR Mood Disorders [mesh] OR Bipolar Disorder [mesh] OR bipolar OR manic OR psychopath* OR Mental Retardation OR Mental Retardation [mesh] OR Mental Health [mesh] OR Personality OR Personality [mesh] OR Personality Disorders [mesh]

#5. #1 AND (#2 OR #3) AND #4