

## Prevalence of Mental Disorders among High-School Students in Iran: A Systematic Review

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**Objective:** The aim of the present study is to perform a systematic review of studies that investigated the prevalence of any kind of mental disorders in high school students in Iran .

**Method:** A broad search was conducted in MEDLINE/PubMed, ISI web of Science, PsychINFO, CINAHL, EMBASE, and three Iranian databases, including IranPsych, IranMedex, and Scientific Information Database (SID). To cover studies not published, we did a hand searching of all theses, reports and congresses' abstract booklets which were available in IranPsych. Then, we included the original studies which reported the prevalence of any kind of mental disorders in high school students; data extraction was performed with two researchers for each document.

**Results:** Sixteen studies were finally included, representing 19 estimates of mental disorders in high school students, using diagnostic or screening instruments. The prevalence rate of any mental disorder reported by two studies using diagnostic instruments was equal to 16.6% and 4.34%. The median of prevalence rates of mental disorders reported in studies using screening instruments was 34.4%. There was a significant heterogeneity between the studies .

**Conclusion:** Prevalence rates of mental disorders were reported in a wide range in high school students of Iran. More studies with improved quality are needed in this field.

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

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**M**ental disorders are among the most common health problems all over the world. Global burden of disease estimates placed mental illness at the top three causes of years lost due to disability (1). Considering early age of onset and the chronic course of these disorders compared with other highly burdensome diseases such as cardiovascular illnesses, more emphasis on mental health of children and adolescents is needed. Prevention, detection, and treatment of childhood and adolescent mental disorders are important not only to relieve current distress but also to improve adult functioning and to prevent the perpetuation of this disadvantage into the next

generation (2). For developing any kind of mental health improvement policy, understanding the prevalence of mental disorders is a crucial step (3). Studies investigating the prevalence of mental disorders in Iran reported a wide range of percentages from 1.9% (4) to 58.8% in adult general population (5). Several factors may contribute to explain these differences such as temporal and geographical characteristics, use of different instruments, small sample sizes or methodological biases. Even two national studies with large sample size differ a lot in their estimations with 10.8% (6) and 21% (7). Lack of a reliable knowledge of the prevalence of mental

disorders in Iran is more prominent in the field of child psychiatry.

It seems that there is a need for systematic reviews of the literature addressing prevalence of mental disorders in Iran to build a reliable ground for future studies. Like other fields of medical research, reviews should be based on data that are as complete and as rigorous as possible. Meta-analysis is a tool for extracting and synthesizing new data by means of pooling the data and providing a final value. Even the orderly sorting of data using meta-analytic techniques can provide useful insights into the structure of relevant studies (8).

Trying to have a clear definition of prevalence, in this study, it is defined as the proportion of individuals who manifest a disorder at a specified time, or during a specified period. There are several ways to find out the proportion of people who are affected by a specific mental disorder. However, in this study we reviewed those studies which investigated the prevalence of any kind of mental disorder, not a particular type.

The aim of the present study is to perform a systematic review of studies that have investigated the prevalence of any kind of mental disorders in high school students in Iran. This study is a part of a systematic review of any kind of mental disorders in general population above 15 years of age in Iran. This is also the first systematic review of the prevalence of mental disorders in Iran.

## Materials and Method

### *Search strategy:*

As part of a wider study on the prevalence of any kind of mental disorder in Iran, a broad search was conducted in MEDLINE/Pubmed, ISI web of Science, PsychINFO, CINAHL, EMBASE, and three Iranian databases including IranPsych, IranMedex, and Scientific Information Database (SID) using four groups of terms. The first group (# 1) included the terms *epidemiology*\*, prevalence, risk, population, survey, and screening, combined by the Boolean operator OR; the second group (# 2) consisted of the names of the instruments frequently used to investigate the prevalence of mental disorders such as General Health Questionnaire (GHQ), combined with OR; the third group (# 3) contained terms for mental disorder and its equivalents; and we used a fourth group (# 4) for Iran and its major cities. The final search was a combination of the above mentioned search term groups and is as follows: # 1 AND (# 2 OR # 3) AND # 4. It was adapted to each database with minor changes. For Iranian databases, we dropped the fourth group as we knew all the studies were conducted in Iran. To cover those studies not published, we did a hand searching of all theses, reports and congresses' abstract booklets which were collected in IranPsych. Furthermore, we searched all university affiliated libraries which were placed in Tehran, and added any studies found through

opportunistic ways, and we also tracked the reference lists of relevant studies for any other relevant paper.

Each title and abstract (if available) was reviewed by two researchers in order to exclude irrelevant studies. Potentially relevant papers were assessed in their full texts. In the case of no access to a full text paper, we tried to contact the researchers if possible.

### *Included studies:*

We included original studies which reported the prevalence of any kind of mental disorders in high school students, using either screening or diagnostic instruments. Each paper was reviewed by two researchers independently. In case of discrepancies, opinion of a third researcher was asked. Studies on subpopulations such as studies conducted on immigrants, and those which were performed as a part of a clinical trial or genetic epidemiological studies reporting the prevalence estimates in family members of the affected probands were excluded. Where multiple publications of a single study was presented, the most informative version of the study was included and the other related papers were excluded (full list is available upon request).

### *Data Extraction:*

Mental disorder prevalence studies could be divided into two main categories: One group use some kind of screening instruments such as GHQ and Symptom Checklist-90 (SCL-90) to find out the prevalence of any kind of probable mental disorder while others report the proportion of people affected by mental disorders according to specific diagnostic criteria and for that purpose they may use diagnostic instruments such as Composite International Diagnostic Interview (CIDI). It is obvious that their results are completely different as they measure different variables.

Once a study was included, the data related to study-level variables were extracted: including authors, year of publication, site, urban/rural status, recruitment duration and years covered, case finding method, sample size and type of instruments (screening or diagnostic interview), and rate-level variables (e.g., rates for persons, males or females, life-time or point rates). Two authors checked all the data used in the analysis. Disagreements were resolved through consensus.

In addition, studies were appraised for quality, using a quality assessment checklist, which was designed for this study by researchers; and its validity and reliability was assessed in a different study (Unpublished data). This checklist contains factors such as sample representativeness, using valid and reliable instruments and their Persian translations; standard method of data collection; and reporting rates in age-specific and gender-specific subgroups.

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Authors	Publication year	Publication	Target population	Time of study	Total sample size	Male sample size	Female sample size	Response rate	Instruments	Cut of point	Total prevalence	Male prevalence	Female prevalence
Farazandeh M (12)	1381	Dissertation	High school students on Hashigerd	1381	500	300	200	-	GHQ	-	51.8	43.5	57.3
Ghandeharizadeh (13)	1378	Dissertation	High school students in Mashhad	1377	382	195	187	95%	GHQ	-	35.42	-	-
Ghazanfari A(14)	1382	Paper	High school students in Esfahan	-	1783	826	957	-	GHQ	22	49.4	43.2	54.7
Hoseini S.H (15)	1383	Paper	High school students in Sari	1381	1536	813	722	-	SCL-90	0.7	10.5	-	-
Hoseini S.M, Hoseini S.A(16)	1377	Dissertation	High School students in Qazvin	1377	514	222	292	97%	SCL-90	-	12.1	5.8	20.3
Hoseinifard (9)	1384	Paper	High school students in Rafsanjan	1380	830	377	453	96%	SCL-90	63	21.2	-	-
Hoainifard (9)	1383	Paper	High school students in Rafsanjan	1380	830	377	453	78%	SCL-90/ Diagnostic Interview	-	16.6	10.6	21.6
Masoodzadeh A(5 )	1383	Paper	High school students in Sari	1381	1068	477	591	-	SCL-90	0.7	58.8	52	63
Masoodzadeh A (5)	1383	Paper	High school students in Sari	1381	1068	477	591	-	GHQ	23	39.1	-	-
Mohammadi A(10)	1380	Dissertation	High School students in Shahinshahr	1379	1105	482	623	-	SCL-90	2.34	4.34	2.9	5.45
Mohammadi A (10)	1380	Dissertation	High School students in Shahinshahr	1379	1105	482	623	-	SCL-90/ Diagnostic Interview	2.34	4.34	-	-
Naderi B (17)	1381	Research Project (unpublished)	High school students in Zanjan	1381	395	192	203	-	GHQ	14	36.43	-	-
Namavar S (18)	-	Dissertation	High school students in Ahvaz	1384	301	-	301	-	GHQ	23	18.6	-	18.6
Rezapour M(19))	-	Dissertation	High school students in Masjed-soleiman	1384	200	120	80	-	GHQ	23	33	29	38.8
Salehi S.M. (20))	1379	Research Project (unpublished)	High school students in Saveh	1379	680	347	333	95%	GHQ	28	46.7	39.1	51.6
Sharifi M, Ranjbar M (4)	-	Dissertation	Female Pre-University Students in Qazvin	1380	213	-	213	-	SCL-90	-	1.90	-	1.90
Solhjo F (21)	1383	Dissertation	High school students in Tehran	1382	400	200	200	-	GHQ	23	33.5	23.5	43.5
Yousefi F (22)	1378	Paper	High school students in Sanandaj	1376	1350	502	848	-	GHQ	-	37.2	27.3	46.2
Zarabi H (23)	1380	Paper	High School in Rasht	1380	557	295	262	-	SCL-90	2	10.5	-	-

Note: 1. Empty cells denotes no report; 2. Publication years are in Iranian calendar

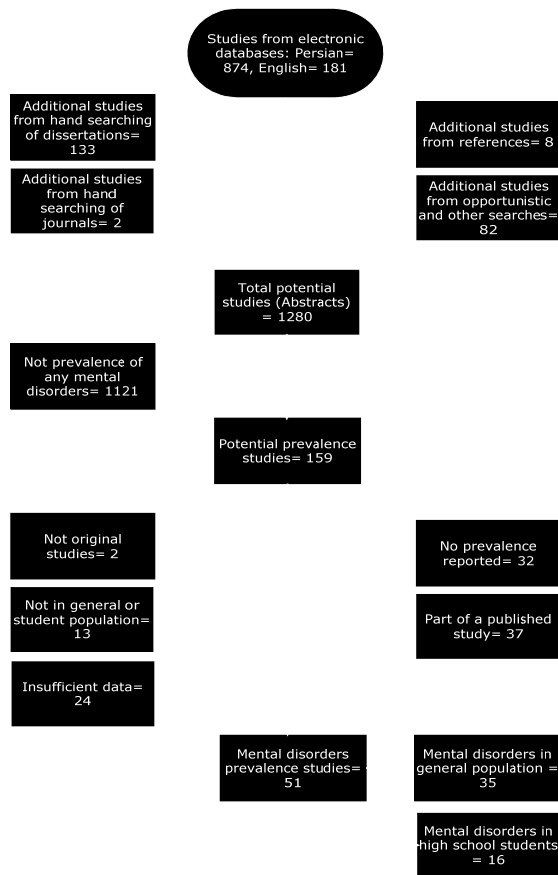


Figure 1: Flow diagram of included studies.

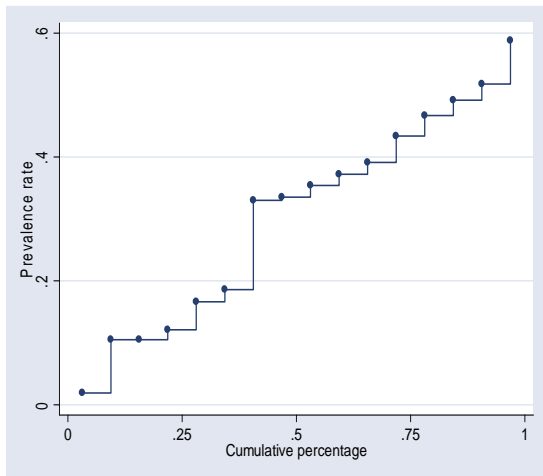


Figure2: Cumulative plot of the prevalence of probable mental disorder in high school students, using screening instruments.

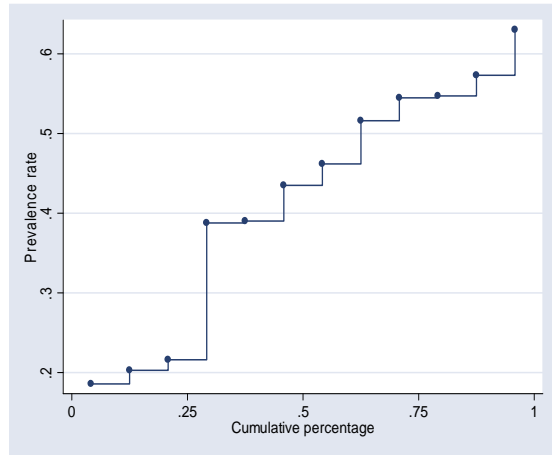


Figure 3: Cumulative plot of the prevalence of probable mental disorder in female high school students, using screening instruments.

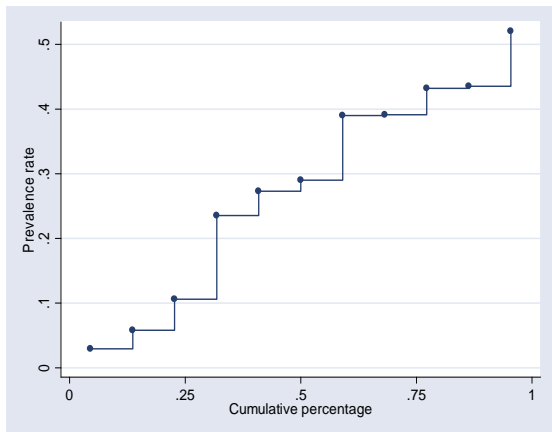


Figure 4: Cumulative plot of the prevalence of probable mental disorder in male high school students, using screening instruments.

In this review, we classified those studies which had a representative sample and we used valid and reliable instruments as high quality studies.

**Data analysis:**

The rates reported in all the included studies are summarized in Table 1; and the distribution of the prevalence rates is presented in cumulative plots. The plots show 50% (median), 25% and 75% quartiles. The data is presented for males and females distinctly.

**Results**

The electronic search initially identified 1055 papers. Additional studies from hand-searching and opportunistic searches resulted in 217 abstracts. Eight abstracts were added through reviewing the papers' reference lists. Finally, a total of 1280 abstracts were

reviewed. All papers were in Persian or English. Of the potentially relevant papers, 82% were identified from electronic sources.

Studying all the 1280 abstracts, 159 were selected for a full text review. Fifty-one out of 159 papers had inclusion criteria and 16 studies done on high school students were finally included in this review.

Most of the studies excluded were those not having a representative sample of student population. The list of the excluded studies is available from the first author. Figure 1 demonstrates flow diagram of the selection of the documents.

These 16 included studies reported 19 prevalence rates (12 rates for females and 11 rates for males; not all studies reported prevalence rates for genders separately). The studies were conducted over a period of nearly seven years, beginning in 1998 (1377 in Iranian calendar). Two out of 19 reported prevalence rates of mental disorders used diagnostic criteria in a two-staged design. After screening was performed using SCL-90-R, a clinical psychiatric interview was performed by a psychiatrist in both studies. Both studies used the cluster sampling method and had large sample sizes. In one study, a sample of 830 students (54% female) was selected in Rafsanjan in Kerman province (9). A total of 16.6% prevalence rate was reported for any kind of diagnosed psychiatric disorder (10.6% in males and 21.6% in females) (9). The other study was performed on a sample of 1105 students in Shahinshahr (56% female). The total prevalence rate of any kind of diagnosed psychiatric disorder was reported 4.34% (5.45% in females and 2.9% in males) (10).

A total of 17 studies used screening instruments to find out probable prevalence rates including the rates reported in those two-staged design studies (nine studies used GHQ, six studies used SCL-90 and one used both). Sample sizes ranged between 200 and 1783. Total prevalence rates ranged between 1.9% and 58.8%. Median prevalence rate in these studies was 34.4% for the whole, 29% for males and 44.8% for females.

Considering the two studies that had a two-stage design, a total of seven studies used SCL-90 to determine the probable rates of prevalence of any kind of mental disorders in students. The median of the prevalence rates was 16.6% for whole (seven studies), 8% for males (three studies) and 38% for females (three studies).

Studies using GHQ for screening reported higher rates with a median of 37.2% for the whole, 39% for males and 44% for females. One study that used both scales reported a prevalence rate of 39% using GHQ and 58% using SCL-90. Another study reported the rate of 18%. Others had a range between 33% and 51% with a mean of 40%. Most of the studies did not mention response rates, but they were reported in four studies that were more than 95%.

Assessing the quality of the included papers, we classified papers with a representative sample and valid

and reliable instruments as high quality studies. Only 2 out of 16 papers had such qualities. One of these high quality studies used SCL-90 and reported a probable mental illness rate of 16.6% and the other used GHQ-28 with the rate of 46%.

### Discussion

We pooled prevalence rates for the included studies in our review. However, many researchers have debated on the validity of these pooled estimates (whether meta-analytic or not), as rates of prevalence depends on several factors such as temporal and geographical parameters; and pooling these naturally heterogeneous data have some limitations. Considering this point, we tried to have a summarized quantitative value as a pooled estimate with random effect model.

This review is vulnerable to publication bias to some extent. Although relevant grey literature has been identified using hand searching of university libraries and dissertations in Iranpsych database, it was most limited to universities located in Tehran.

Generally, the quality of the included studies was not high, thus reducing the possibility of drawing valid conclusions. In many studies, sample sizes were small; only 6 studies had a sample size more than 1000 students. Though random sampling was mentioned in all the included studies, the description of random sampling was often insufficient to judge its quality or the methods used were suboptimal. Most studies were performed in one or two high schools in one area selected for investigation, therefore, making it hard to be a normal population representative.

The reported prevalence rates of mental disorders are quite different with a range of 1.9% to 58.8%. Most of these studies used screening instruments which have not quite enough validity to identify the prevalence rates of mental disorders, particularly in the case of developing health policies. Narrow (2002) pointed out that screening studies naturally report a higher prevalence due to high sensitivity, and relying on them for health system organizations make an excess economic load. In addition, the reliability and validity of the translated version of these instruments are not mentioned in most of the studies and we do not know whether they have used a single translation or different versions (11).

Only two included studies in our review had a diagnostic evaluation of mental disorders. Robert et al. on their review of prevalence of psychopathology among children and adolescents emphasized the importance of case ascertainment. Two types of standardized interviews, Diagnostic Interview Schedule for Children and semi-structured ones such as the Kidde-Schedule for Affective Disorders and Schizophrenia (K-SADS), were performed in most of their study reviews. They reported that many researchers believed a multistage design has a greater accuracy in estimating the prevalence of mental disorders (3). In our review, we only found 2 multi-

stage studies and none of them had used a structured diagnostic interview.

None of the included studies had studied life-time prevalence of mental disorders. No study mentioned any period prevalence and all had just point prevalence. In conclusion, Prevalence rates of mental disorders were reported in a wide range in high school students of Iran. More studies with improved quality are needed in this field.

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