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A Study of Prevalence of Anxiety in Iran: Systematic Review and Meta-analysis

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ABSTRACT

Background and objective*: Anxiety is defined as an unknown or uncertain factor which causes distress of mind and sense of danger regarding various diseases including heart palpitation. The purpose of this study is to estimate the prevalence of anxiety in Iran through meta-analysis technique.*

Materials and methods*: We searched international online databases such as Scopus, PubMed, ISI and Google Scholar and national online databases such as Magiran, Iranmedex, SID and Medlib for certain standard keywords including prevalence, anxiety, stress and Iran. The data were analyzed using meta-analysis technique (random effects model). Heterogeneity of studies was evaluated by I2 index. The data were analyzed with STATA Ver.11 software.*

Results*: 81 articles were investigated with a sample size of 23455 people from 1993 to 2016. Prevalence of anxiety in Iran was 42% (36% in women and 27% in men). Prevalence of mild, moderate, intense and highly intense anxiety in Iran was 31%, 37%, 19% and 2%, respectively. In addition, the prevalence of depression was 44%, prevalence of stress was 40%, prevalence of overt anxiety was 21% and prevalence of covert anxiety was 24%.*

Conclusion*: Due to the high prevalence of anxiety and as a result stress and depression in the population of Iran, new strategies are necessary to deal with this issue considering different strata and age groups.*

Keywords: Prevalence, Anxiety, Stress, Iran

INTRODUCTION

Today, anxiety is considered as a very important disease and the ongoing complexity of civilization, rapid changes and ignorance of religion and family values have brought new conflicts and anxieties for individuals [1]. This disorder induces weakness and disability in people and affects their lifestyle [2]. Moreover, this is a major issue in industrial and developed societies and increases with technological advancements [3].

Studies indicate that anxiety and depression cause numerous problems and complications and a considerable part of healthcare services are dedicated to these issues [4]. Anxiety is a conscious process and if continued, affects patient's lifestyle and delays recovery [5]. Depression and anxiety have negative effects on functional status, quality of life, duration of hospitalization and even treatment result in patients with cancer and thus it is necessary to assess and cure these two disorders in patients [6]. Depression and anxiety are quite common in patients with coronary artery disease (CAD) and they slow down the process of treatment [7]. According to the study of Meshkani et al., there is a significant correlation between anxiety and economic satisfaction, job satisfaction, drug addiction, a chronic or incurable disease in the patient and chronic or incurable disease in family [8]. Results of several studies demonstrated that there is a direct and significant correlation between anxiety and individual characteristics of patients with myocardial infarction [5], educational performance of midwifery students [9] and mental health satisfaction [8]. In addition, anxiety is highly prevalent in patients with epilepsy and cancer compared with the general population [6,10].

Since teachers play a crucial role in providing peace of mind by conveying their morale and behavior unconsciously to students,

a favorable influence requires the absence of anxiety in these people and learning necessary skills to reduce such feelings [11]. Children and teenagers experience a wide range of anxieties as they grow up. These anxieties are sometimes so harsh that make their daily life difficult [12]. Studies show that medical students are more prone to stress factors including anxiety than other students due to a longer course of study and stressful nature of the field which includes learning clinical skills and clinical decision-makings [8]. Anxiety in one the most common disorders which can be under the influence of environmental factors including diet [13]. Patients with cancer consider their illness incurable and half of them suffer from a kind of psychiatric disorder [14]. Alopecia Areata is one of the prevalent causes of hair loss. This is an autoimmune disease which may cause mental and psychological problems, particularly depression or anxiety [15].

According to World Health Organization statistics in 2001, psychological distress, particularly depression, has increased in recent years and level of anxiety was 38.6% in developing countries and was 83.2% in developed countries in 2001 [16]. About 30 million people in the USA suffer from anxiety [17] According to epidemiological studies in Iran, level of anxiety ranges from 11.9% to 30.2% [18]. Lifetime prevalence of anxiety in women is higher than men; 30.5% *vs.* 19.2% [19].

Due to numerous studies conducted in regard with anxiety and in order to validate the results of these studies, performing a meta-analysis study to have an accurate and reliable measure for planners and researchers in this area seems crucial. The purpose of this study is to estimate the prevalence of anxiety in Iran through systematic review and meta-analysis. This study was designed to perform a systematic review of previous studies in the first step and perform a meta-analysis of final data in the last step to study the prevalence of anxiety in Iran.

MATERIALS AND METHODS

Searching strategy

This was a meta-analysis study to determine the prevalence of anxiety in Iran. The relevant literature was obtained through an Internet search and manual search of documents reviewed in the library at Tehran University of Medical Sciences. The searching involved several Internet databases such as Iranmedex, SID, Magiran, Irandoc, Medlib, IranPsych, Science Direct, ISI, PubMed and Scopus. It was limited to 23 years and updated up to the autumn of 2016. Selection focused on theses, scientific journals in Iran and abroad, papers presented at congresses and organizational reports.

The domestic search in Persian was not sensitive to operators OR, AND and NOT. Hence, the terms “prevalence, ،" Stress", "Anxiety" and Iran” were inserted to achieve higher sensitivity. As for searching through foreign databases, the same terms Iran, prevalence and anxiety were included. The keywords were standardized in MeSH and eventually the strategy of Iran AND anxiety was used to search. In addition to this reference, the selected papers were screened so as to find relevant studies.

Selection of papers

A list was prepared to contain the titles and abstracts for all papers searched the domestic databases. This was performed independently by two researchers. The papers with duplicate titles were then removed. At the next stage, the abstracts were reviewed to find the suitable studies. In the case of foreign databases, the same procedure to domestic databases was adopted. In fact, all studies were stored in EndNotex6 and the rest of stages were possessed by the software application.

The inclusion criteria were: 1. All studies were descriptive, 2. Prevalence of anxiety was mentioned. It should be noted that the sensitivity of paper selection was increased through minimum inclusion criteria. However, the most relevant and highest quality studies were achieved through the exclusion criteria as follows: 1. Unrelated studies in terms of study and research topic, 2. Studies with insufficient information on, 3. Low-quality of studies. The checklist strengthening the reporting of observational studies in epidemiology was used to assess STROBE [20]. The checklist has 22 sections that cover different parts of a report. Each section is given a score, while some other sections with greater importance were given higher scores.

Data extraction

To reduce bias and error in reporting data collection, two researchers independently extracted data from the papers through a standard form of data collection that was already prepared. The form was first designed by the research team, including the following items: Author’s name, research title, publish date, journal name, research design, and inclusion and exclusion criteria, sample size and so on.

Statistical analysis

This study analyzed the prevalence of anxiety in Iran so as to estimate the point prevalence at 95% confidence interval. The variance of each study was calculated using the binomial distribution formula and heterogeneity between studies was examined through Cochran Q-test with a significant level of less than 0.1 and an indicator of heterogeneity-attributed changes [I2]. All statistical analyses were conducted through STATA Ver.11 using the command “metan”. A significance level of the test was considered to be $P>0.05$.

RESULTS

A summary of how the papers were imported into meta-analysis

In the first step, 103 articles were found, out of which 9 articles were excluded due to overlapping and being duplicates. The abstract

of 94 probably relevant articles was reviewed and 8 more articles were found to be irrelevant and were excluded from the study. Full text of 86 articles was studied and ultimately, 81 articles were qualified for meta-analysis (Figure 1).

Out of 81 surveyed articles with a sample size of 23455 people from 1993 to 2016, 59 articles mentioned the prevalence of anxiety in Iran which was estimated to be 42% (95% CI: 36-48%). Lowest prevalence of anxiety was observed in the study of Omranifard et al. in (8%), whereas the highest prevalence of anxiety was observed in the study of Rahighi et al. in (42%). Due to the heterogeneity of studies, the confidence interval for each study based on random effects model is presented in Figures 1-4.

Prevalence of anxiety was 27% (95% CI: 12-43%) in Iranian men and 36% (95% CI: 19-53%) in Iranian women. In addition, prevalence of overt anxiety was 21% (95% CI: 13-29%), prevalence of covert anxiety was 24% (95% CI: 12-37%), prevalence of depression was 44% (95% CI: 36-52%) and prevalence of stress was 40% (95% CI: 17-73%) (Tables 1 and 2).

Some studies described the prevalence of anxiety as mild, moderate, intense and highly intense (Table 3)

Prevalence of anxiety was diverse in different regions of Iran. Prevalence of anxiety in the north of Iran was 48% (95% CI: 37-60%) in 21 studies. It was 69% (95% CI: 46-91%) in the south in 3 studies, 36% in the center (95% CI: 28-45%) in 17 studies, 35% in the west (95% CI: 24-45%) in 9 studies and 38% in the east of Iran (95% CI: 23-52%) in 8 studies.

In an analysis based on statistical population, the prevalence of anxiety was 48% (95% CI: 37-60%) in university students in 12 studies, 24% (95% CI: 18-31%) in nurses in 2 studies, 43% in patients (95% CI: 32-54%) in 21 studies, 35% in school students (95% CI: 23-47%) in 13 studies, 31% in the elderly (95% CI: 4-58%) in 2 studies and 68% in women (95% CI: 32-1.05%) in 2 studies.

In an analysis based on type of questionnaire, prevalence of anxiety in Iran was 62% (95% CI: 44-80%) based on Cattle questionnaire in 5 studies, 30% (95% CI: 25-36%) based on dass questionnaire in 5 studies, 51% (95% CI: 30-72%) based on scl-90-R questionnaire in 6 studies, 46% (95% CI: 25-66%) based on Beck questionnaire in 9 studies, 55% (95% CI: 36-75%) based on Sarason questionnaire in 6 studies, 46% (95% CI: 27-64%) based on HADS questionnaire in 5 studies, 33% (95% CI: 24-42%) based on GHQ questionnaire in 5 studies and 43% (95% CI: 27-59%) based on Spielberger questionnaire in 6 studies. The number of studies in other questionnaires was limited.

DISCUSSION

Out of 81 surveyed articles with a sample size of 23455 people from 1993 to 2016, 59 articles mentioned the prevalence of anxiety in Iran which was estimated to be 42% (95% CI: 36-48%). According to the study of Rahgozar et al., the prevalence of anxiety in Iran was reported to be 23.5% in 2008 [91]. The prevalence of anxiety was 27% in Iranian men and 36% of Iranian women. Therefore, the prevalence of anxiety is generally higher in women. According to the study of Ahmadi and Lashkaripour, the prevalence of anxiety in boys was higher than girls, which is in accord with the present research [12,13]. Researches of Dr. Kessler demonstrated that anxiety disorders in women are twice as men [92]. Studies have revealed that one out of every four people is suffering from an anxiety disorder and women are more prone to these disorders than men [3]. A survey in Canada in 1994 showed that one-year prevalence of anxiety disorders in young boys and girls aged 15-24 was 11% and 20%, respectively [93]. Various studies demonstrate that every year, one out of every four or five people around the world suffer from anxiety disorders due to severe stress; 40% of them are men and 60% are women [94]. On the other hand, the prevalence of overt anxiety, covert anxiety, depression, and stress in Iran was 21%, 24%, 44% and 40%, respectively. Larijani et al. have demonstrated that 43.3% of nursing students suffered from harmful covert anxiety [95]. Prevalence of mild, moderate, intense and highly intense anxiety in Iran was 31%, 37%, 19% and

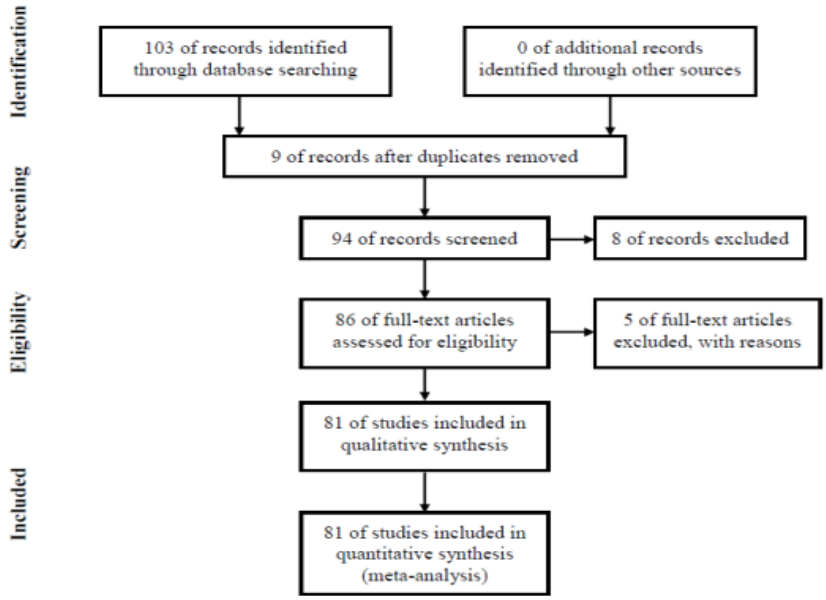

Figure 1: Flow chart of studies to the systematic review and meta-analysis

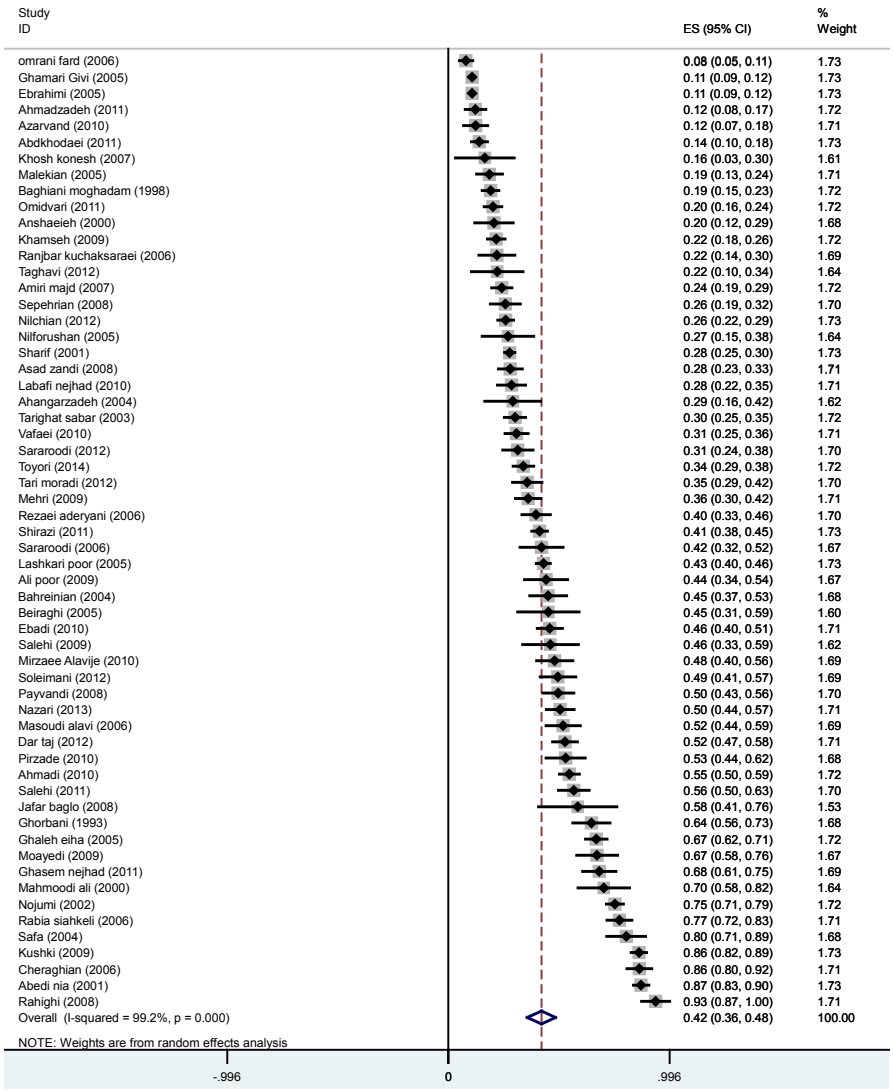

Figure 2: Prevalence of anxiety in Iran and its 95% confidence interval based on name of the author and year of the study according to random effects model. The midpoint of each segment indicates the prevalence of anxiety in Iran in each study and the lozenge sign indicates the prevalence of anxiety in Iran for all studies

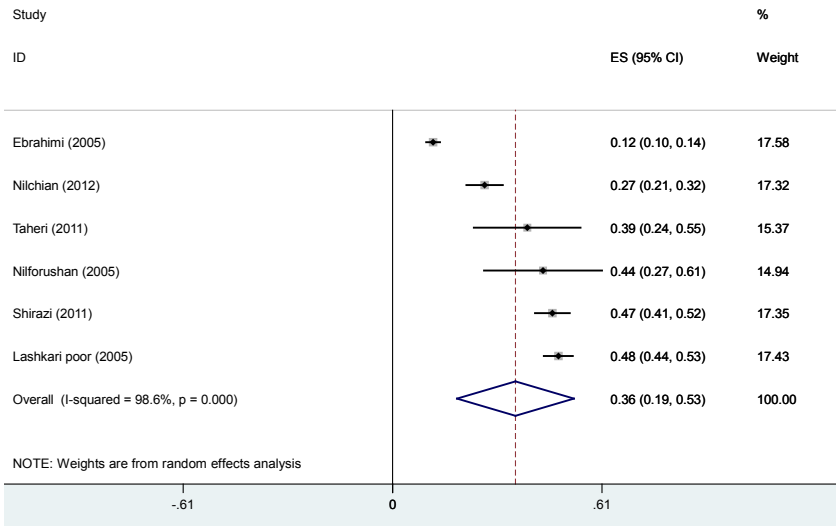

Figure 3: Prevalence of anxiety in Iranian women and its 95% confidence interval based on the name of the author and year of the study according to random effects model. The midpoint of each segment indicates the prevalence of anxiety in each study and the lozenge sign indicates the prevalence of anxiety in Iranian women for all studies

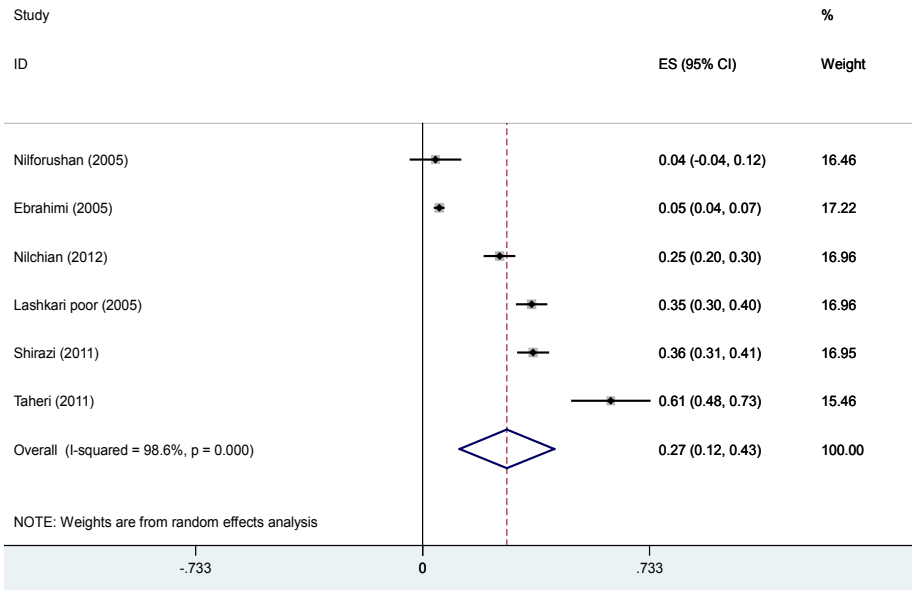

Figure 4: Prevalence of anxiety in Iranian women and its 95% confidence interval based on the name of the author and year of the study according to random effects model. The midpoint of each segment indicates the prevalence of anxiety in each study and the lozenge sign indicates the prevalence of anxiety in Iranian women for all studies

Table 1: Specifications of surveyed articles regarding the prevalence of anxiety in Iran

ID	Author	Year	City	Question	Statistical Society	The Prevalence of anxiety %	Sample Size
[21]	Alavije	2010	Esfahan	Cattell	Students	0.479	144
[22]	Khamse	2009	Tehran	Dass	nurses	0.216	413
[23]	Nazari	2013	Kerman	SCL-90-R	patients	0.504	250
[24]	Ahmadzade	2011	Esfahan	SCL-90-R	patients	0.122	196
[10]	Bahreinian	2004	Tehran	SCL-90-R	patients	0.449	138
[25]	Beiraghi	2005	Tehran	Beck	patients	0.45	50
[26]	Sararoodi	2006	Esfahan	Sigmund	patients	0.42	100
[27]	Masud zade	2008	Sari	Dass	Staff	-	576
[28]	Valikhani	2013	Shahriar	Dass	patients	-	120
[15]	Safa	2004	Khoram abad	SCL-90-R	patients	0.801	80
[29]	Salehi	2009	Mahabad	Sigmund	patients	0.46	60
[30]	Ghasem nejad	2008	Lahijan	Spielberger	Students	-	300
[31]	Mehri	2009	Sabzevar	GHQ	Students	0.359	270
[5]	Salehi	2005	Tehran	Spielberger	patients	-	200
[11]	Nojumi	2002	Tehran	Cattell	Teachers	0.75	500
[32]	Baghiani moghadam	1998	Yazd	Other	Students	0.19	410
[33]	Sepehrian	2008	Saghez	Spielberger	Students	0.256	160
[7]	Ebadi	2010	Tehran	HADS	patients	0.457	300
[35]	Ahangarzade	2004	Orumie	GHQ	Students	0.29	50
[35]	Maslak pak	2005	Orumie	Spielberger	nurses	-	140
[6]	Malekian	2005	Esfahan	Beck	patients	0.185	173
[36]	Pirzade	2010	Esfahan	GHQ	Students	0.528	123
[37]	Labafi nejad	2010	Tehran	Spielberger	Students	0.285	196
[38]	Nilforushan	2005	Esfahan	Beck	Infertile wife	0.268	56
[12]	Lashkari poor	2005	Zahedan	Sarason	Students	0.428	935
[39]	Azarvand	2010	Tehran	TAI	Students	0.123	140
[40]	Shirazi	2011	Sistan	Sarason	Students	0.411	762
[13]	Ahmadi	2010	Shiraz	Beck	Students	0.545	480
[41]	Moshkani	2004	Tehran	Spielberger	nurses	-	267

[8]	Moshkani	2005	Tehran	Spielberger	Students	-	250
[42]	Moahedi rad	2010	Mahabad	Spielberger	Students	-	570
[43]	Khoshkonesh	2007	Sabzevar	GHQ	Elderly	0.164	30
[44]	Farpoor	2012	-	Beck	Adults with stuttering	-	52
[45]	Gholami	2007	Babok	TAI	Students	-	51
[9]	Yazdani	2011	Najafabad	Sarason	Students	-	114
[46]	Cheraghian	2006	Abadan	Sarason	Students	0.86	150
[47]	Taghavi	2012	Shahriood	Spielberger	patients	0.22	49
[48]	Rezaei aderyani	2006	Tehran	Dass	Students	0.395	223
[49]	Nilchian	2012	Shahrkord	MCDAS	nurses	0.258	583
[50]	Asadzandi	2008	Tehran	Dass	Women	0.279	272
[51]	Abedinia	2001	Tehran	Cattell	Students	0.868	370
[52]	Salehi	2011	Tehran	Spielberger	Students	0.565	200
[53]	Omidvari	2011	-	Other	General Population	0.201	385
[54]	Abdkhodaei	2011	Mahabad	Other	children	0.1397	358
[55]	Ghale eiha	2005	Hamedan	SCL-90-R	patients	0.666	360
[14]	Kuchaksaraei	2006	Tabriz	Zhong	patients	0.218	100
[56]	Soleimani	2012	Rasht	Beck	patients	0.493	150
[57]	Emrani fard	2006	Esfahan	Beck	Caregivers	0.079	307
[58]	Sotude	2000	Tehran	Beck	Women	-	55
[59]	Alavi	2006	Kashan	SCL-90-R	patients	0.517	163
[60]	Tarighat sabar	2003	Tehran	HADS	patients	0.3	350
[61]	Taheri	2011	Abadan	Spielberger	patients	-	97
[62]	Ali	2000	Ghaem Shahr	Other	Students	0.7	60
[63]	Payvandi	2008	Sari	Beck	Women	0.495	200
[64]	Tayuri	2014	Birjand	Dass	Students	0.338	400
[65]	Anshaeie	2000	Esfahan	Zhong	patients	0.205	83
[66]	Ghasem nejad	2011	Lahijan	Spielberger	Students	0.68	150
[67]	Dartaj	2012	Hormozgan	Sarason	Students	0.525	310
[68]	Moayedi	2009	Bandarabas	Beck	patients	0.67	100
[69]	Siahkeli	2006	Rasht	HADS	Caregivers	0.771	218
[70]	Givi	2005	Ghorve	sarand	Students	0.107	2000
[71]	Kushki	2009	Tehran	Sarason	Students	0.858	381
[72]	Rahighi	2008	Mahabad	Beck	patients	0.933	60
[73]	Borhani	2009	Kerman	Other	patients	-	120
[74]	Hariri	2009	Tehran	LAS	Students	-	211
[75]	Amirimajd	2007	Abhar	Sarason	Students	0.24	342
[76]	Ebrahihmi	2005	Ghorve	sarand	Students	0.107	2000
[77]	Vafaei	2010	Tehran	Dass	Students	0.307	300
[78]	Ghorbani	1993	Esfahan	Cattell	patients	0.644	125
[79]	Moadeli	2004	Shiraz	Spielberger	Students	-	317
[80]	Chitsaz	2005	Esfahan	Cattell	patients	-	250
[81]	Alipoor	2009	Tehran	HADS	Elderly	0.44	100
[82]	Bandari	2012	Tehran	Spielberger	Caregivers	-	80
[83]	Jafarbeglo	2008	Ghom	Spielberger	Students	0.583	30
[84]	Jafarmanesh	2010	Tehran	HADS	Parent	-	440
[85]	Sararoodi	2012	Esfahan	HADS	patients	0.313	176
[86]	Tari moradi	2012	Tehran	Cattell	Elderly	0.355	200
[87]	Asayesh	2009	Golestan	Emer Day	Students	-	64
[88]	Moghimian	2009	Najaf abad	Sarason	nurses	-	110
[89]	Behdani	2000	Sabzevar	Spielberger	Students	-	264
[90]	Sharif	2001	Shiraz	GHQ	Families	0.276	1536

Table 2: Prevalence of anxiety in Iran based on surveyed subgroups

	Number of studies	Sample Size	The Prevalence of Anxiety (CI 95%)	Min Prevalence of Anxiety (CI 95%)	Max Prevalence of Anxiety (CI 95%)
The Prevalence of anxiety	59	18807	42% (36-48%)	8% (5-11%)	93% (87-100%)
The Prevalence of anxiety in women	6	2250	36% (19-53%)	12% (10-14%)	48% (44-53%)
The Prevalence of anxiety in men	6	2173	27% (12-43%)	4% (0-12%)	61% (48-73%)
The Prevalence of Revealed anxiety	6	1488	21% (13-29%)	7% (4-10%)	44% (31-57%)
The Prevalence of Hidden anxiety	6	1488	24% (12-37%)	5% (2-8%)	48% (40-56%)
The Prevalence of Depression	26	6261	44% (36-52%)	14% (12-15%)	75% (66-85%)
The Prevalence of Stress	4	1308	40% (17-63%)	18% (14-22%)	72% (66-78%)

Table 3: The prevalence of anxiety in Iran

Subgroups	Number of studies	Sample size	Mean score Prevalence of anxiety (CI 95%)	Min Prevalence of anxiety (CI 95%)	Max Prevalence of anxiety (CI 95%)
The prevalence of mild anxiety	21	1447	31% (42-20%)	4% (2-6%)	91% (88-94%)
The prevalence of moderate anxiety	20	1466	37% (45-29%)	7% (5-10%)	68% (6%-75%)
The prevalence of severe anxiety	23	837	19% (24-15%)	2% (0-3%)	46% (35-57%)
The prevalence of very severe anxiety	4	17	0% (4-1%)	2% (0-4%)	10% (2-18%)

2%, respectively. Therefore, most anxious Iranians suffer from moderate anxiety. Moreover, the prevalence of anxiety was 48% in the north, 69% in the south, 36% in the center, 35% in the west and 38% in the east of Iran. According to these reports, the highest prevalence of anxiety is observed in southern regions.

In an analysis based on statistical population, the prevalence of anxiety was 48% in university students, 24% of nurses, 43% in patients, 35% in school students and 31% in the elderly. According to these results, university students suffer the most, compared with other strata which may be under the influence of various factors such as stressful examinations, being away from family and etc.

In an analysis based on type of questionnaire, prevalence of anxiety in Iran was 62% based on Cattle questionnaire, 30% based on dass questionnaire, 51% based on scl-90-R questionnaire, 46% based on Beck questionnaire, 55% based on Sarason questionnaire, 46% based on HADS questionnaire, 33% based on GHQ questionnaire and 43% based on Spielberger questionnaire. Due to the diversity of questionnaires and number of studies conducted by each questionnaire, diverse results are reported for the overall prevalence of anxiety in Iran.

Epidemiological studies have revealed that 8% to 12% of teenagers suffer from anxiety disorders which severely affects their daily life [76]. Anxiety disorders are estimated as the most prevalent (8.31%) psychiatric disorders in Iran [96]. Epidemiological study of anxiety disorders in Chaharmahal and Bakhtiari province in 2001 showed that the prevalence of anxiety disorders was 9.52% [97]. In a study on interns of Iran University of Medical Sciences in 2000, the prevalence of anxiety was estimated to be 17.1% in female interns [98]. Due to the heterogeneity of results of previous studies, a systematic review and meta-analysis study seems necessary.

According to World Health Organization, psychological distress, particularly depression has increased in recent years and level of anxiety is 38.6% in developing countries and is 83.2% in developed countries [16]. Prevalence of anxiety disorders was 11.8% in USA with 23 million adults [99]. In a study on female students of Dubai University of Medicine and Health Sciences, the prevalence of anxiety was estimated to be 28.6% [100]. In the study of Bell-Dolan et al., the prevalence of anxiety disorders in teenagers ranged from 5.7% to 17.7% [101]. Moreover, the prevalence of various anxiety disorders in teenagers was reported to be 10% to 20% [102]. Prevalence of anxiety disorders in children aged 2-4 was reported to be 17% [103].

Among the limitations of this study is diversity of questionnaires and incompleteness of information extracted from the abstract of some articles.

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