Prevalence of Anxiety Disorders among Children and Adolescents in Iran: A Systematic Review

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Objective: We aimed to conduct a review to investigate the prevalence of anxiety disorders among Iranian children and adolescents.
Method: We systematically reviewed the literature up to June 2014. We searched three Persian databases (Magiran, IranMedex and SID) and three English databases: PubMed, Scopus and PsycINFO. All original studies that investigated the current prevalence of anxiety in a sample of Iranian children and adolescents were entered into the study. All studies conducted on special samples or in special settings were excluded. By searching English databases, we obtained 124 original studies. After removing duplicate papers, 120 articles remained. In the next step, we screened the articles based on their title. In sum, 95 Persian and English articles had relevant titles. After screening based on the abstract and full text, 26 studies remained. After screening based on the full text, all selected studies were qualitatively assessed by two evaluators separately.
Result: Twenty five studies were eligible and reported different types of anxiety disorders (i.e., generalized anxiety, separation anxiety, obsessive-compulsive disorder, phobias and panic disorder). The samples varied from 81 to 2996 among studies and their age range was 5 to 18 years. These studies were conducted in different cities of Iran. SCL-90 is a frequently used questionnaire. All anxiety disorders were mostly investigated with the prevalence rates ranging from 6.8% in Saravan to 85% in Bandar Abbas. OCD was the second common study with prevalence rates ranging from 1% in Tabriz to 11.9% in Gorgan .
Conclusion: Our findings revealed considerable amount of anxiety disorder among Iranian children and adolescents. Given the fact that anxiety disorder has negative effects on the well-being and function of individuals and can lead to severe problems, this disorder should be considered in mental health programs designed for children and adolescents.
Keywords: *Anxiety, Prevalence, Children, Adolescents, Iran*

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Anxiety disorders include separation anxiety disorder, selective mutism, specific phobia, social phobia, panic disorder, agoraphobia and generalized anxiety disorder, which are characterized with excessive fear and anxiety and relative behavioral disturbances(1). Based on the fourth edition of Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), obsessive-compulsive disorder and post-traumatic stress disorder were subsets of anxiety disorders, which have been brought out from this category and relocated to their own respective chapters in the fifth edition of DSM (2).

There are several risk factors for anxiety disorders such as female gender, lower education, low socioeconomic situation, familial anxiety disorders, hypersensitivity of amygdala, introversion personality in early childhood, behavioral inhibition, parental psychopathology, high levels of coldness, protectiveness and authoritarianism in parents and adverse experiences in childhood and traumatic life events (2-4)

The high personal, social and economic burdens are associated with anxiety disorders (5); therefore, that impairment in psychosocial and work functioning, greater fatigue and sleep disturbance, poorer physical health, suicide attempts, global cognitive impairment and social disability were significantly linked to generalized anxiety disorder (6).

Anxiety disorders are the most prevalent mental disorder among children and adolescents involving 10-20% of this group (7). In a national face-to-face survey of 10123 American adolescents aged 13 to 18 years, Burstein et al. (2014 & 2011) reported that around 3% and 9% of the participants had generalized anxiety disorder in 6 months duration, and social phobia in their lifetime, respectively (8, 9). Sharkey & McNicholas (2012) indicated selective mutism of 0.18% in 10927 urban school children in

Republic of Ireland (10). Another research reported social phobia of 12.7%, agoraphobia of 8.6% and specific phobia of 7.5% among 6-18 years old students in Qatar (11). In a research conducted on 6 to 17 year old children and adolescents in Korea, 7.9% specific phobia was reported in one year (12). In a national cohort study, Esbjørn et al. (2010) evaluated the prevalence of anxiety disorders among 13241 Danish children and adolescents aged 0–19 years. The results of this study revealed that 0.4%, 0.5%, 1.1%, 1.5% and 2.4% of the participants had separation anxiety disorder, specific phobia, social phobia, generalized anxiety disorder and other anxiety disorders respectively (13). Ranta et al. (2009) showed a 12-month prevalence of 3.2% for social phobia in 12–17-year-old Finnish adolescents (14). Another research reported 4.4% social phobia in Swedish adolescents (15). Adewuya et al. (2007) found 2.4%, 2.1%, 3.6%, 2.5%, 1.7%, 0.2%, 4.8% and 15% for the 12-month prevalence of panic disorder with or without agoraphobia, separation anxiety disorder, generalized anxiety disorder, specific phobia, obsessive–compulsive disorder, post-traumatic stress disorder, social phobia and all anxiety disorders among Nigerian adolescents, respectively (16). In a study conducted on Polish adolescents, Rabe-Jabłońska et al. (2004) reported that 17% and 7% of the adolescents had specific and generalized types of social phobia, respectively (17). Boyd et al. (2000) indicated that 13.2% of 11-18-year-old Australian adolescents were anxious (18).

To our knowledge, no study has investigated the prevalence of anxiety disorders in children and adolescents across Iran; only different evaluations were done on this subject in some cities. For instance, Jalali & Pourahmadi (2012) assessed anxiety disorders among 10-14-year-old students in Gorgan, a city in north of Iran. They reported social phobia of 10.5%, panic disorder of 12.2%, generalized anxiety disorder of 12.8%, obsessive-compulsive disorder of 11.9%, separation anxiety disorder of 15.7% and fear of physical injury of 18% (19). Another research conducted on 7-9-year-old male students in Isfahan indicated 6.93% separation anxiety disorder (20).

Several studies reported the prevalence of anxiety disorders in children and adolescents in different locations of Iran, but there was heterogeneity between the reported prevalence. Furthermore, due to the lack of overall review, we conducted a systematic review on the literature and reported the prevalence of anxiety disorders among children and adolescents in Iran.

Material and Methods

We systematically reviewed the literature from 1995 until June 2014. Due to the specificity of the study subject, we only searched Persian and English databases. We searched three Persian databases (Magiran, IranMedex and SID) and three English databases: PubMed, Scopus and PsycINFO. Our search terms in English databases were "(incidence OR rate OR prevalence) AND ("psychiatric disorder" OR anxiety OR phobia OR panic OR ocd OR "obsessive compulsive disorder" OR ptsd OR "post-traumatic stress disorder") AND (child OR adolescent OR adolescence) AND Iran", and was restricted by "title and abstract" field. In Persian databases, we used Persian words that had same meaning with English terms. Our search was limited to online databases.

Inclusion and Exclusion Criteria

Since the main goal of this study was to estimate the prevalence of anxiety among Iranian children and adolescents, all original studies that investigated the current prevalence of anxiety in a sample of Iranian children and adolescents were entered into the study. All studies conducted on special samples (e.g., those who experienced special events such as earthquake) or in special settings (e.g., those who lived in an orphanage or dormitory) were excluded from the study.

Identification and Screening

By searching English databases, we obtained 124 original studies. After removing duplicate papers, 120 articles remained. In the next step, we screened the articles based on their title and 37 had relevant titles. The Persian databases did not have an option to export search results; we read the list of the search output and selected the relevant studies based on their title. Fifty eight Persian articles had relevant titles. In total, 95 Persian and English articles had relevant titles. After screening based on the abstract and full text, 25 studies remained (Figure 1).

Quality Assessment

After screening based on the full text, all selected studies were qualitatively assessed by two evaluators separately. We used a new instrument that is made by Giannakopoulos et al. for assessing the quality of prevalence studies (21). This instrument considers three main criteria: sampling, measurement and analysis. No study was excluded due to low quality.

Data Extraction

The data (year and area), participants' characteristics (total sample, percent of boys, percent of girls and age) and prevalence of all types of anxiety were extracted from the included studies. Two researchers extracted the data based on a previously prepared data extraction form.

Results

As seen in Table 1, 25 studies were eligible to answer our study question (the prevalence of anxiety disorder among Iranian children and adolescents). These studies reported different types of anxiety disorders (i.e., generalized anxiety, separation anxiety, test anxiety, OCD, PTSD, phobia and panic disorder). The samples varied from 81 to 2996 among studies with the age range of 5 to 18 years.

Table 1: Summary of Included Studies

	studies	Total (N)	Male (%)	Female (%)	Age (mean or rang)	City or province	Instrument/s	Outcome/s (%)		
								Male (%)	Female (%)	Both (%)
1	Mozafari et al.(34)	199	-	-	12-18	Shiraz	Childhood Behavioral Checklist (CBCL)	-	-	Separation anxiety: 0% Specific phobia: 3% Social phobia: 8% Panic disorder: 1% Agoraphobia: 1.2% Generalized anxiety disorder: 7% OCD: 3.5% PTSD: 1.5%
2	Amirfakhraei & Alinaghizadeh (22)	800	42.5%	57.5%	high school students	Bandar Abbas	The Symptom Check List-90-Revised (SCL-90-R)	Anxiety disorder: 29% Specific phobia: 15% OCD: 38%	Anxiety disorder: 50% Specific phobia: 28% OCD:52%	Anxiety disorder: 85%
3	Lashkaripour et al. (38)	935	42.2%	57.8%	Middle School Students	Zahedan	Test Anxiety Questionnaire (TAQ)	Test Anxiety:35.2%	Test Anxiety: 48.3%	Test Anxiety: 42.8%
4	Ghafarinejad (40)	2944	50.9%	49.1%	High school Students	Kerman	Semi Structured Questionnaire based on DSM IV	Social Phobia: 10.3%	Social Phobia: 19%	Social Phobia: 14.6%
5	Ahmadi et al. (33)	410	50.7%	49.3%	High School Students (17-18)	Shiraz	Beck Anxiety Inventory	Anxiety Disorder:44.7%	Anxiety Disorder: 64.5%	Anxiety Disorder: 54.5%
6	Abd-Khodaie & Sadeghi (41)	358	0	100%	5-6	Mashhad	The Child Symptom Inventory (CSI)	-	Separation Anxiety: 13.97%	
7	Nilchian & Mohammadi (39)	583	54.4%	45.6%	Elementary School Students (4th, 5th, 6th Classes)	Shahrekord	Modified Child Dental Anxiety Scale Figurated	-	-	Dental anxiety: 9.34%
8	Qamari-givi et al. (42)	2000	-	-	Elementary School Students (5th Class)	Qorveh	Screen for Childhood Anxiety Related Emotional Disorders (SCARED)	Generalized Anxiety: 9.4%	Generalized Anxiety: 11.08%	Generalized Anxiety: 10.07%
9	Narimani (26)	731	-	-	High School Students	Ardebil	Cattell's Anxiety Scale Questionnaire	-	-	Anxiety Disorder: 24.1%
10	Ranjbar et al. (35)	1092	55.2%	44.8%	5-16	Tabriz	Rutter Questionnaire and Evaluation of Psychiatrist	-	-	Anxiety Disorder: 6.9% Separation Anxiety: 0.7% Specific Phobia: 1.6% Generalized Anxiety: 0.54% OCD: 1%
11	Nassi et al. (20)	1514	100%	0	7-9 (Elementary School Students)	Isfahan	Separation Anxiety Scale, Children Anxiety Inventory	Separation Anxiety: 6.93%	-	-

	studies	Total (N)	Male (%)	Female (%)	Age (mean or rang)	City or province	Instrument/s	Outcome/s (%)		
								Male (%)	Female (%)	Both (%)
12	Saberi (27)	350	50%	50%	Elementary School Students	Roodehen	Childhood Behavioral Checklist (CBCL)	Anxiety Disorder: 12%	Anxiety Disorder: 16%	Anxiety Disorder: 14%
13	Hajiamini et al. (43)	200	28%	72%	6-10 (Elementary School Students)	Abhar	School Anxiety Scale-Teacher Report (SAS-TR)	Social Phobia: 21.3% Generalized Anxiety: 20%	Social Phobia: 78.8% Generalized Anxiety: 80%	Social Phobia: 23.5% Generalized Anxiety: 20%
14	Assarian et al. (36)	293	49.5%	50.5%	High School Students	Kashan	Yale-Brown Scale	OCD: 5.1%	OCD: 3.75%	OCD: 8.87%
15	Jalali & Pourahmadi (19)	344			Schooler children (10–14 years old childen)	Gorgan	Spence Child Anxiety Scales (SCAS)	Anxiety Disorder: 7.3%	Anxiety Disorder: 3.5%	OCD:11.9% Anxiety Disorder: 10.8% Separation Anxiety: 15.7% 18% Fear of Physical Injury (specific Phobia) Social Phobia: 10.5% Panic Disorder: 12.2% Generalized Anxiety: 12.8%
16	Shams et al. (23)	909	39.20%	60.80%	14-18 years	Cities of Ardakan and Maybod, a Semi-Rural Area in the Province of Yazd (south- East of Iran)	the Maudsley Obsessive-Compulsive Inventory (MOCI) & the Symptoms Checklist -90-revised (SCL-90-R)	OCD: 4.7%	OCD: 6.7%	OCD: 11.2%
17	Ghoreishi et al. (28)	81	0%	100%	15-18 years	Zanjan	Zung	-	Anxiety Disorder: 22.30%	
18	Seyd-nozadi (44)	337	53.50%	46.50%	16-20 years	Mashhad	-	-	-	Severe levels of state and trait anxiety was seen in 23% and 19%, of students respectively
19	Masud-zadeh (37)	2996	0%	100%	16.22±3.4	Sari	Maudsley Obsessive-Compulsive Inventory (MOCI)	-	OCD: 31.2%	-
20	Sadeghian (29)	600	0%	100%	16-17 years	Hamedan	GHQ-28	-	Anxiety Disorder: 46.5%	-
21	Kheyrkhah (30)	159	0%	100%	14-16 years	Tehran	Spiel Berger Anxiety Questionnaire	-	Anxiety Disorder: 18.% Severe & 53.5 % mild	-
22	jena-abadi (24)	117	48.70%	51.30%		Saravan	SCL-90-R	-	-	Anxiety Disorder: 6.8% Severe
23	Salari (31)	134	61.20%	31.80%	13-19 years	Zahedan & Gonabad	Cattell's Anxiety Scale Questionnaire	-	-	Anxiety Disorder: 55.97 Mild & 13.43 Severe
24	Movahhedi-rad (32)	570	0%	100%	-	Mashhad	Spiel Berger Anxiety Questionnaire	-	22.8% Trait Anxiety	-
25	Hosseyni-fard (25)	830	45.42%	55%	High-school	Rafsanjan	SCL-90-R & DSM-IV	-	-	Anxiety Disorder: 8.4%

These studies were conducted in different cities of Iran. Different questionnaires were used in these studies, but SCL-90 was used most frequently (22-25). All anxiety disorders were most investigated in 11 studies (22, 24-33) with prevalence rates ranging from 6.8% in Saravan (24) to 85% in Bandar Abbas (22). OCD was the second common study which was evaluated in 5 researches (19, 22, 23, 34-37) with prevalence rates ranging from 1% in Tabriz (35) to 11.9% in Gorgan (19). Test anxiety disorder with the prevalence rate of 42.8% in Zahedan (38), and dental anxiety with prevalence rate of 9.34% in Shahrekord (39) were only reported in one study (Table 1).

Discussion

Due to the methodological heterogeneity between the studies, we could not combine or meta-analyze the results. This review confirms the high prevalence of anxiety disorders with considerable heterogeneity in different regions of Iran. Although a review showed a prevalence rates of 2.6% to 41.2% for any anxiety disorder in pre-adolescent children (45), our study reported the prevalence rates of 6.8% to 85% for anxiety disorders in Iranian children and adolescents (19, 22, 24-27, 31, 33, 35, 44). Among Iranian investigations, more frequencies of anxiety disorders were reported in most studies using the symptom inventory (22-24, 26, 29, 31, 32, 41, 43). Furthermore, some cities such as Bandar Abbas had higher rates of anxiety disorders (22), which need to be considered and studied .

In this study, the prevalence rates of separation anxiety disorder were 0.7% to 15.7% among Iranian children and adolescents (19, 20, 35); which is consistent with other findings that reported 0.5% to 20.2% for the prevalence of separation anxiety disorder (45).

The present review showed the prevalence rates of 0.54% to 12.8% for generalized anxiety disorder (19, 35, 42, 43), which nearly confirms the past review that indicated the prevalence rates of 0.16% to 11.1% (45). However, one Iranian study conducted in Abhor found the prevalence of 20% for generalized anxiety disorder (43), which needs to be investigated .

The prevalence rates of OCD ranging from 1% to 11.9% among Iranian children and adolescents were higher than other communities which reported the prevalence rates of 0.03% to 2.6% (19, 23, 34-36, 45); this inconsistency should be further studied .

Social phobia with prevalence rates of 8% to 23.5% among Iranian children and adolescents were more common than four communities reporting the prevalence rates of 0.08% to 0.9% (19, 34, 40, 43, 45). However, one study showed the prevalence of 17% among polish adolescents (17), and another study found the prevalence rate of 12.7% among children and adolescents in Qatar (11). Overall, this high prevalence of social phobia among Iranian children and adolescents needs to be considered .

In spite of seven studies reporting the specific phobia of less than 1% (13, 45), three researches found the prevalence rates of 2.5% to 7.9%, and two studies showed specific phobia greater than 20% (11, 12, 16). The present review reported two Iranian studies with the prevalence rates of 1.6% and 3% for specific phobia (34, 35), and one Iranian research with the prevalence of 18% for fear of physical injury (19) . Thus, our findings are almost in line with some past studies.

One Iranian study reported the prevalence rate of 1% for panic disorder and 1.2% for agoraphobia (34), which were slightly higher than two studies reporting the prevalence rates of less than 0.5% for panic disorder and agoraphobia (45). However, the Nigerian study showed the prevalence of 2.4% for panic disorder (16), and another study found the prevalence of 8.6% for agoraphobia in Qatar (11). Also, one Iranian study showed the prevalence rate of 12.2% for panic disorder in Gorgan, which needs to be studied (19) .

Many studies reported the prevalence rates of dental anxiety among children and adolescents; for example, 14.5%, 7.1%, 18%, 20.6% of Turkish, Scottish, Brazilian and Taiwanese children and adolescents experienced dental anxiety (46-49); however, one Iranian research showed dental anxiety with a prevalence rate of 9.34% in Shahrekord (39).

While one study reported selective mutism to be 0.18% among Irish children (10), we did not find any Iranian study to evaluate selective mutism. Since the prevalence rates of PTSD were indicated in special Iranian populations under special incidents, they were excluded .

Across the included studies, anxiety disorders were almost twice as common among females as compared to males, and this finding is in line with that of other studies (2, 50).

Limitations

We have only explored Persian and English databases for peer reviewed articles and did not use gray literature in our review. This issue can have an effect on the reliability of our findings. Future review with considering more sources of data may lead to more precise results. In addition, we had no access to ISI database in our country.

Conclusion

Our findings showed considerable amount of anxiety disorder among Iranian children and adolescents. Given that anxiety disorders have negative effects on the well-being and function of individuals and can lead to severe problems, they should be seriously considered in mental health programs provided for children and adolescents. Cognitive behavioral treatments may be used to reduce anxiety disorders among children and adolescents.

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