

Research paper

The prevalence, comorbidity and socio-demographic factors of depressive disorder among Iranian children and adolescents: To identify the main predictors of depression



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ABSTRACT

Background: Depressive disorders are a major public health problem in developed and developing countries. Recently, several risk factors have been described for depressive disorders in children and adolescents. The aim of the present study was to identify the main risk factors that can affect the incidence of depression in Iranian children and adolescents.

Methods: A total of 30,546 children and adolescents (between 6 and 18 years of age) participated in a cross-sectional study to identify the predictors of depressive disorders. Depressive disorders were assessed using the Persian version of the Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS-PL). In addition, a demographic characteristics questionnaire was completed by parents of the participants. The data was analyzed using the SPSS22 software via performing the descriptive analysis and the multiple logistic regression analysis methods. *P*-values less than 0.05 were considered statistically significant.

Results: Results showed that a higher age (15–18), being female, and the father's unemployment were associated with an increased odds ratio for depressive disorders. The age of 10–14 (OR = 2.1; 95% CI, 1.57–2.81), the age of 15–18 (OR = 4.44; 95% CI, 3.38–5.83), female gender (OR = 1.44; 95% CI, 1.2–1.73) and the father's unemployment (OR = 1.59; 95% CI, 1.01–2.5) were significant positive predictors, whereas, the mother's job (as a housewife) (OR = 0.66; 95% CI, 0.45–0.96) and a history of psychiatric hospitalization of the father and mother (OR = 0.34; 95% CI, 0.15–0.78 and OR = 0.34; 95% CI, 0.14–0.84) were negative predictors for depressive symptoms.

Conclusion: Depressive symptoms are common in children and adolescents and are correlated with age and gender. The assessment of the prevalence of psychiatric disorders, especially the depressive disorders and their comorbidities, may help to prevent mood disorders in children and adolescents.

1. Introduction

In most middle income countries (such as Iran) children and adolescents form a large proportion of the population. In Iran, for example, it is estimated that one fifth of the population—an estimated 23 million people – is between the age of 10 and 19 (Results of Population and Housing Censuses in Iran. Statistical Center of Iran, 2017).

Most of the epidemiological studies that have been conducted in high income countries indicate that the depressive disorders are highly prevalent and have a high lifetime incidence, high chronicity, and considerable functional impairment (Richards, 2011).

The depressive disorder and clinically significant symptom levels are well recognized as major public health issues in both developed and developing countries. The early onset depression is closely related to issues of chronicity and lifetime recurrence. The onset of depression during adolescence predisposes the individual to lifetime recurrence of depressive episodes, particularly in women (Kessler, 2003; Kessler et al., 2001).

Depression is the world's leading cause of disability-adjusted life years lost among adolescents. 2–8% of children and adolescents suffer from mood disorders such as depression, with a peak incidence in the puberty period, about 40% of affected children experience a recurrent depression, about one third of affected children will contemplate to commit suicide, and 3–4% will die from suicide (Hazell, 2011, 2015)

Thapar et al. (2012) conducted one of the most comprehensive reviews to date of the global literature on the epidemiology of depression in adolescence. The majority of studies found a prevalence of depression of less than 1% in children and this increases substantially throughout adolescence, with an estimated one-year prevalence of 4–5% in mid to late adolescence. Also one study noted that one of the most conclusive findings of many studies, mostly conducted in Western nations, was a significantly higher rate of depression in females (approximately 2:1) and other studies linked this higher rate to factors

associated with puberty (Lewis et al., 2015a,b,c; Thapar et al., 2012; re 2012).

Nair et al. (2004) performed a study on 1014 young people (aged 10–19 years) in India (Nair et al., 2004). Forty seven percent of the females who had given up school reported a higher rate of depressive symptoms. Twenty two percent of female and 13% of male secondary students stated a higher rate of depression, whereas 29% of female college students acited a borderline or higher rate of depression. Pillai et al. noted that previous research on mental disorders in adolescents reported a wide range of prevalence rates from 3% to 36% (Pillai et al., 2008). Community-based studies of Indian adults have found the prevalence rates of 61% for depressive symptoms and 16–34% for clinical depression (Sarkar et al., 2012). Generally prevalence rates reported in studies are higher for self-reported symptoms than for symptoms diagnosed via interviews conducted directly with adolescents and this is consistent with a large number of studies on depression (Lewis et al., 2014a,b).

There are several studies about the main predictors of depressive disorder in children and adolescents, some studies have been argued that mental disorders of parent (such as depression) significantly have been associated with depressive symptoms in childhood and adolescence (Bond et al., 2005; Chang et al., 2007).

In another research, Karacetin et al. (2018) argued that individuals with maternal mental disorder and paternal physical dysfunctions may be suitable targets for depression treatment in young people population.

About 40% of the children with depressive disorders have a family history of psychological disorders (Beardslee et al., 1993). As well as age has been recognized as vital correlate of mood disorders and the rates of depression were higher than in adolescents versus in children (Grey et al., 2002). Gender has also been associated with affective disorders and depression was more prevalent among female than male (Grey et al., 2002; Toros et al., 2004), however, the sex difference in depression prevalence is not evident in childhood and adolescence

(Karacetin et al., 2018). Divergent prevalence of depressive disorder between females and males and the potential for gender as a moderating variable, the research needs to consider the importance of gender in the longitudinal research about development of children and adolescent depression (Mazza et al., 2009). Although the prevalence of depression in rural areas appears to be higher than urban areas, Probst et al. (2006) reported that significantly, rural areas residents haven't higher prevalence of depression compared to urban areas.

To sum up the construct of childhood and adolescents depression is complex, and many factors such as biological or environmental factors effect on development of adolescent depression.

Despite this, very few epidemiological studies of depression in children and adolescents have been undertaken in Iran. In one study, for example, Mohammadi et al. reported that the prevalence of depression in boys was 5.8% and in girls it was 4% in 5 provinces of Iran. According to their results, there was no difference between the two genders in the frequency of depressive disorders (Mohammadi et al., 2008).

The current study assessed a large sample of Iranian children and adolescents living across Iran. The study draws on the Iranian Child and Adolescent Psychiatry (IRCAP) Study which used a standardized research design to assess the predictors of the main psychiatric problems in children and adolescents.

We carried out this cross-sectional study to answer three research aims. The first purpose of this study was to investigate the prevalence of depressive disorders, and the second was to determine the comorbidity patterns in children and adolescents in Iran. The final aim was to consider the prediction of depressive symptoms by age, gender and other demographic variables.

2. Method

2.1. Participants and procedures

Data in the present study are a part of the data collected in the Iranian Child and Adolescent Psychiatry (IRCAP) Study; a national study assessing the main psychiatric disorders of adolescents and children and their correlation with parents' personality, social capital and life styles. This project was approved by the National Institute for Medical Research Development (NIMAD) and the Research Ethics Committee of the NIMAD. Participants were provided with a description of the research being conducted and were informed that participation was voluntary and that they had the right to decline to participate in the study. Data were collected from around Iran, that is from 30 provinces ($n = 30,546$) and the valid response was 29,699. The IRCAP data were obtained from all provinces of Iran using a three-stage cluster sampling design, we randomly selected the samples within each province from among 6 to 18 years olds. The data was collected from 170 blocks (the blocks were recruited according to postal code randomly). Then, of each cluster head, participants were selected; 6 cases consist of 3 students of each sex in various age groups (6–9, 10–14 and 15–18 years). The participants were selected from rural and urban zones in each province proportionally.

The inclusion criteria stipulated that children and young people should be between 6 and 18 years of age and should be identified as Iranians. Participants were excluded if the child or adolescent or their parents had restrictions or disabilities that prohibited them from sufficiently completing the questionnaires, such as a severe developmental disorder or psychosis or learning disabilities, or an inability to read and speak Persian language.

Table 1
Prevalence of depressive disorder based on demographic variables in children and adolescents ($n = 29,699$).

Variables		Total <i>n</i>	Percent	With depressive disorder			CI (95%)	
				<i>n</i>	Crude percent	Adjusted percent	Min	Max
Sex	Boy	14,012	49	208	1.5	1.6	1.35	1.87
	Girl	14,599	51	313	2.1	2.2	1.94	2.54
Age	6–9	9741	34	71	0.7	0.7	0.5	0.9
	10–14	10,028	35	160	1.6	1.7	1.38	2
	15–18	8842	30.9	290	3.3	3.6	3.16	4.17
Place of residence	Urban	23,905	83.6	442	1.8	1.9	1.74	2.16
	Rural	4706	16.4	79	1.7	1.6	1.14	2.28
Father educations	Illiterate	1222	4.4	31	2.5	2.5	1.6	3.9
	Primary school	4436	16.1	101	2.3	2.3	1.75	2.94
	Guidance & high school	6126	22.2	124	2	2.2	1.81	2.76
	Diploma	8024	29.1	123	1.5	1.6	1.28	1.95
	Bachelor	5836	21.2	86	1.5	1.7	1.32	2.16
	MSc or higher	1901	6.9	25	1.3	1.7	1.1	2.5
Mother educations	Missing	1066		32				
	Illiterate	1611	5.8	41	2.5	2.4	1.6	3.6
	Primary school	5273	18.9	117	2.2	2.2	1.7	2.8
	Guidance & high school	5425	19.5	110	2.0	2	1.6	2.5
	Diploma	9214	33.1	151	1.6	1.7	1.4	2.1
	Bachelor	5369	19.3	71	1.3	1.7	1.3	2.2
Father job	MSc or higher	945	3.4	10	1.1	1.8	1	3
	Missing	774		21				
	Private sector	17,711	64.2	317	1.8	1.9	1.6	2.1
	Public sector	8942	32.4	146	1.6	1.9	1.5	2.2
Mother job	Unemployed	952	3.4	29	3	2.2	1.3	3.7
	Missing	1006		30				
	Private sector	1140	4.1	27	2.4	2.4	1.5	3.8
Father history of psychiatric hospitalization	Public sector	2976	10.7	51	1.7	2.3	1.7	3.1
	Housewife	23,823	85.3	426	1.8	1.8	1.6	2
	Missing	672		17				
	Yes	105	0.4	6	5.7	7.1	2.8	16.9
Mother history of psychiatric hospitalization	No	28,506	99.6	515	1.8	1.95	1.7	2.1
	Yes	86	0.3	5	5.8	11.3	5.6	21.5
	No	28,525	99.7	516	1.8	1.9	1.7	2.1
Total		28,611	100	521	1.8	1.9	1.7	2.1

2.2. Assessment

Data were collected using the following instruments:

1) **Socio-demographic form**

The socio-demographic questionnaire was designed by the study principal investigators and consist of questions such as sex, age, place of residence, parental history of hospitalization, education, vocation and so on.

1) **K-SADS-PL:** The Kiddie-Schedule for Affective Disorders and Schizophrenia- (K-SADS-PL) is a well-established, semi-structured diagnostic interview that assesses present and past episodes of psychopathology as per the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychological Association). Diagnosticians, who experiential training prior to assessing participants, included MSc. of clinical psychology, PhD students of clinical psychology, and post-baccalaureate research assistants and had an academic degree in clinical psychology as well as experience in adolescent and child psychiatric assessment. Furthermore they were exactly trained for conducting the interviews and assessments of this project. For this purpose, 250 MSc. clinical psychologists were invited; they were trained during a 5-day workshops held in each province. Trainees learned how to administer the diagnostic interview, score and interpret the results. The workshops included presentations, roleplaying, interviews with real patients and discussions. All sessions were held by the principal

investigators of the project in each province.

Children or adolescents and their parents were independently interviewed and the interviewer created a summary rating based on his/her “best-estimate” clinical judgment for all diagnoses. We utilized depression diagnoses (meeting criteria for sub threshold depression) for the analyses. Sub-threshold diagnoses included depressive episodes lasting at least 6 months but with three to four symptoms, or depressive episodes with five or more symptoms that lasted 1–2 weeks. The inter-rater reliability based on 120 pairs of ratings (ten interviews with 24 total diagnoses, rated by five interviewers) was $\kappa = 0.85$ (Orvaschel, 1994).

In a previous study, the reliability and validity of the Persian translation was established in Iran and it was reported satisfactory. The consensual validity of anorexia nervosa was 0.49. There was a good external validity (test-retest) and inter-rater reliability, and also a good to excellent sensitivity, specificity and negative and positive predictive validity for nearly all of the disorders (Ghanizadeh et al., 2006).

In this study, a diagnosis of depressive disorders included current major depression disorder (with and without psychotic symptoms) and any other depressive disorders.

2.3. Procedure

The interviewers encouraged the parents to fill in the questionnaire forms and allow the girls/boys to participate in the interviews. The semi-structured interview (K-SADS-PL) was done by two clinical psychologists to diagnose any mental disorders.

Table 2

The odds ratios (95% CI) for the depressive disorder in subjects (n = 29,699).

Variables		Univariate analysis OR (crude)	CI (95%)	P-value	Multivariate analysis OR (adjusted)	CI (95%)	P-value
Sex							
	Male	1.00 Baseline					
	Female	1.438	1.208–1.712	0.0001	1.443	1.202–1.732	0.0001
Age group							
	6–9	1.00 Baseline					
	10–14	2.158	1.638–2.845	0.0001	2.102	1.571–2.812	<0.0001
	15–18	4.556	3.526–5.887	0.0001	4.445	3.385–5.836	<0.0001
Locus of life							
	Urban	1.00 Baseline					
	Rural	0.932	0.736–1.180	0.556	0.783	0.601–1.020	0.07
Father education							
	Illiterate	1.00 Baseline					
	Primary school	0.91	0.61–1.36	0.65	1.128	0.719–1.769	0.601
	Guidance & high school	0.775	0.523–1.148	0.203	0.98	0.614–1.572	0.940
	Diploma	0.593	0.401–0.879	0.009	0.822	0.500–1.353	0.442
	Bachelor	0.576	0.383–0.867	0.008	0.84	0.484–1.456	0.534
	MSc or higher	0.496	0.292–0.840	0.009	0.778	0.396–1.530	0.467
Mother education							
	Illiterate	1.00 Baseline					
	Primary school	0.85	0.597–1.21	0.37	0.925	0.621–1.379	0.703
	Guidance & high school	0.77	0.538–1.10	0.150	0.979	0.640–1.479	0.922
	Diploma	0.63	0.446–0.884	0.008	0.927	0.597–1.439	0.735
	Bachelor	0.50	0.343–0.736	0.001	0.721	0.423–1.227	0.228
	MSc. or higher	0.39	0.195–0.780	0.0001	0.457	0.193–1.085	0.076
Father job							
	Public sector	1.00 Baseline					
	Private sector	1.099	0.904–1.336	0.342	1.071	0.84–1.364	0.58
	Unemployed	1.842	1.230–2.756	0.003	1.595	1.015–2.507	0.043
Mother job							
	Public sector	1.00 Baseline					
	Private sector	1.520	0.965–2.395	0.071	1.064	0.635–1.781	0.815
	Housewife	1.048	0.784–1.401	0.750	0.663	0.454–0.969	0.034
Father history of psychiatric hospitalization	Yes	1.00 baseline					
	No	0.31	0.14–0.71	0.006	0.34	0.15–0.78	0.011
Mother history of psychiatric hospitalization	Yes	1.00 baseline					
	No	0.31	0.12–0.76	0.011	0.34	0.14–0.84	0.02

OR adjusted: odds ratio.

CI: confidence interval.

The interviewers referred to the participant's home and asked them items of semi-structured interview during 30–40 min. Moreover socio-demographic variables including gender, age, parent education, and place of residence were obtained

The IBM SPSS₂₂ software was used to analyze the descriptive and inferential statistics. The odds ratio (OR) and multiple logistic regression analyses were performed to determine which variables across diagnostic groups were statistically significant predictors of depressive disorders.

Two-sided *P*-values which were less than 0.05 were considered significant.

3. Results

Descriptive statistics for the study variables and demographics data has been shown in [Table 1](#).

The subjects that participated in this study (2016–2017) whose age ranged from 6 to 18 years with an average age of 11.81 ± 3.78 years (mean \pm SD). The majority of subjects (35%) were between 10–14 years of age and 83.6% lived in urban area.

24.7% of mothers were illiterate or had a primary school education, 19.5% had a middle or high school education, 33.1% had completed year 12 of high school (Diploma), 19.3% had obtained a bachelor's degree and 3.4% had obtained a Master of Science or a higher degree.

20.5% of fathers were illiterate or had a primary school education, 22.2% of them had a middle school or high school education, 29.1% had completed year 12 of high school (Diploma), 21.2% had obtained a bachelor's degree and 6.9% had obtained a Master of Science or a higher degree.

The prevalence rates of depression were 2.2% and 1.6% in females and males respectively. The results also showed that the prevalence rates for those living in rural and urban areas were 1.6% and 1.9% respectively ([Table 1](#)).

Results of the multivariate logistic regression analysis are presented in [Table 2](#). The results of the multivariate logistic regression analysis showed that, the odds of depression in females was about 1.4 times more than that in males. In addition, the probability of depression increased with age until it reached its peak in the ages of 15–18 (OR = 4.4; 95% CI = 3.38–5.89) ([Table 2](#) and [Graph 2](#)). According to the logistic regression, the cases whose parents did not have a history of psychiatric hospitalization (OR = 0.34; 95% CI = 0.14–0.84) were less

likely to be diagnosed with depression than those whose parents had a history of psychiatric hospitalization; which means that a previous history of any psychiatric disorder in parents does not necessarily predispose a person to suffer from depression.

The findings of this study revealed that as age (10–14 and 15–18) increases the risk of depression (positive effect), indicating that with the increase of age, the odds of depression equaled 2.1 times for the ages of 10–14 and 4.4 times for the ages of 15–18. According to the logistic regression (multivariable analysis), after controlling for the effects of an effective variables (such as age and sex), place of residence, mother and father's education, none of them predicted depression significantly. In addition, we found that the father's unemployment increased the chance of depression (positive effect, OR = 1.57), and the mother's unemployment (housewife) reduced the odds of depression (negative effect, OR = 0.66).

Moreover, psychosis and other developmental disorders were not included in these analysis models, because a few participants had these disorders at each time point.

Furthermore, patients with comorbidities displayed a higher prevalence than those without comorbidities, ranging from 0.1% for encopresis and autism to 28.1% for Oppositional Defiant Disorder (ODD). ([Table 3](#) and [Graph 1](#))

Also [Graph 2](#) has shown the increasing trend of depression in different ages in both sexes, which means that the ages of 6 and 18 had the lowest and the highest prevalence of depression, respectively.

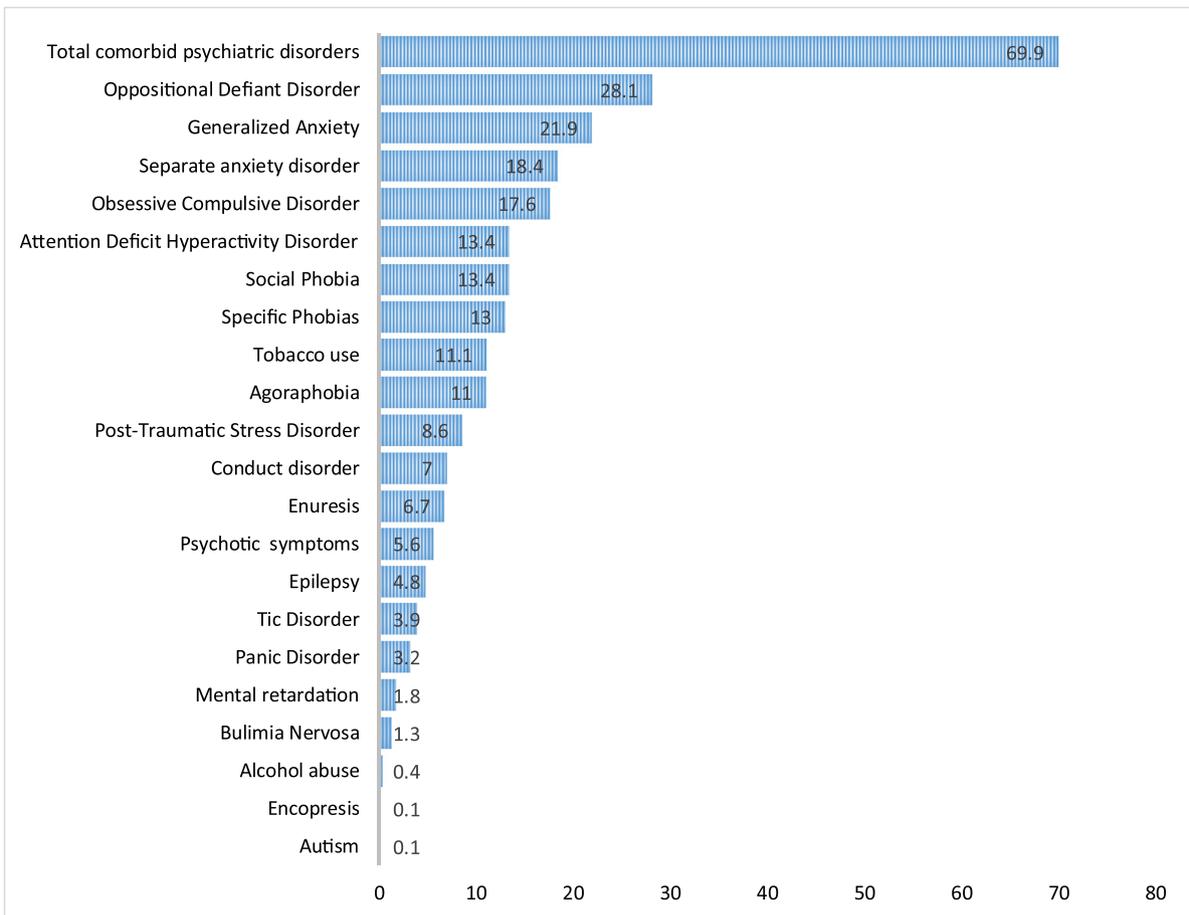
4. Discussion

This is a population-based study, to examine the current prevalence of depressive disorder in a sample of Iranian children and adolescents, showing that the prevalence rates of depression were 2.2% in females and 1.6% in males. Findings of previous studies reported a higher prevalence of depression than the findings of our study. For example, by the end of adolescence, 10–20% of the youth experience a major depressive episode, and up to 25% will experience sub threshold symptoms of depression ([Bertha and Balazs, 2013](#); [Kessler et al., 2012](#)).

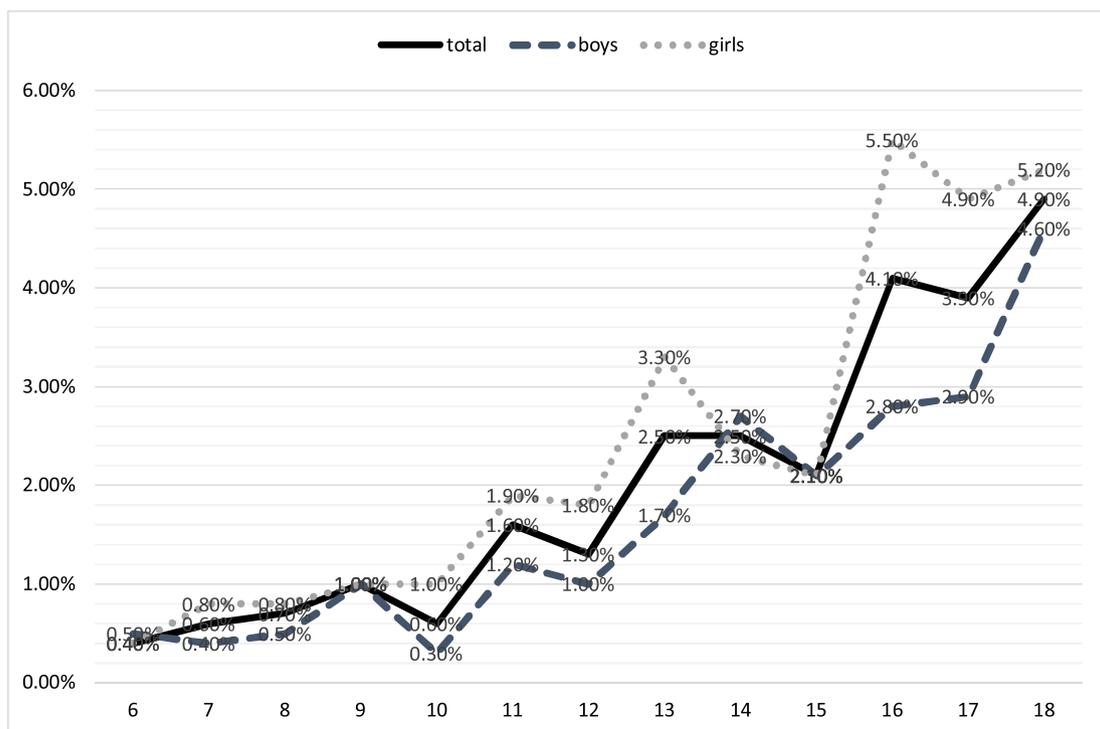
[Nair et al. \(2004\)](#) showed that 47% of girls who had left the school reported the symptoms of depression. Among secondary high school students, 13% of boys and 22% of girls were diagnosed as depressed, and 29% of female college students had a borderline or higher grade of depression.

Table 3
Rates of comorbid psychiatric disorders in children and adolescents with the depressive disorder.

Psychiatric disorders	Number	Percent Unweighted	Weighted	CI (95%)	
Psychotic symptoms	19	3.6	5.6	3.6–8.5	
Anxiety disorders	12	2.3	3.2	1.8–5.6	
	Separate anxiety disorder	117	22.5	18.4	14.6–22.7
	Social phobia	69	13.2	13.4	10.2–17.4
	Specific phobias	60	11.5	13	9.9–17
	Agoraphobia	52	10	11	8.2–14.8
	Generalized anxiety	127	24.4	21.9	17.8–26.5
	Obsessive compulsive disorder	73	14	17.6	14.1–22.1
	Post-traumatic stress disorder	38	7.3	8.6	5.9–11.8
Behavioral disorders	74	14.2	13.4	10.2–17.4	
	Conduct disorder	36	6.9	7	4.7–10.2
	Oppositional defiant disorder	146	28	28.1	23.7–33.2
	Tic disorder	21	4	3.9	2.4–6.7
Neurodevelopmental disorders	1	0.2	0.1	0.05–1.6	
	Autism	19	3.6	1.8	0.8–3.7
	Mental retardation	29	5.6	4.8	2.9–7.4
Substance abuse disorders	54	10.4	11.1	8.2–14.8	
	Tobacco use	4	0.8	0.4	0.2–2.1
	Alcohol abuse	46	8.8	6.7	4.5–9.8
Elimination disorders	2	0.4	0.1	0.05–1.6	
	Enuresis	4	0.8	1.3	0.6–3.3
	Encopresis	4	0.8	1.3	0.6–3.3
Eating disorders	368	69.7	69.9	64.7–74.4	
	Bulimia nervosa				
Total comorbid psychiatric disorders					



Graph 1. Rate of disorders comorbid with the depression disorder.



Graph 2. Rate of depression disorder by different ages and sex group.

In another research, Fuhrmann et al. demonstrated that the rate of depression symptoms of clinical relevance was 5.7% (Fuhrmann et al., 2014). Similar to our results, Egger and Angold (2006) reported that among younger children, the prevalence of depression increased from 0.3% in 2 year old children to 3.0% in 5 year olds. Lewis et al. (2017a,b) reported that notably an increase in age shows a small increase in depression in the Australian and American groups for psychosomatic symptoms.

But Lewis et al. (2014a,b) reported that the reported prevalence is higher for self-reported symptoms than for symptoms diagnosed through interviews that have been conducted directly with adolescents, and this is consistent with findings of broader studies of depression (Lewis et al., 2014b). The inconsistency between these results and those of the previous studies could be due to the utilization of different sample sizes and different depression assessment tools. Another possible explanation is that in our country, referring to a psychiatrist or psychologist is sometimes considered as a taboo (Alavi et al., 2017), which in turn could negatively influence the results. Another reason is that the samples of this study were younger than in previous studies which could impress our results.

The findings showed that the odds ratio of depression in females compared to males was about 1.4. Similarly, several researchers have identified a series of risk factors, such as the female gender, that are associated with the vulnerability of children and adolescents to developing depressive symptoms. For example, Thapar et al. noted that in Western nations, there was a significantly higher rate of depression in females than in males (approximately 2:1) (Thapar et al., 2012). Hankin. reported that Women are more likely to experience depression than men at a ratio of 2:1, with gender differences first emerging during early adolescence (Hankin, 2006).

Likewise, Kalinowska et al. (2013) reported that depression is one of the mental illnesses in children and adolescents. According to their opinion, main risk factors for depression include: being a female, and having a family history of depression, subclinical symptoms, negative cognitive style and negative life events (Kalinowska et al., 2013). Also, Ying et al. (2013) noted that age and gender were risk factors for both PTSD and depressive symptoms. In contrast, Lewis et al. (2017a,b) reported that being female was associated with lower depression symptoms in their sample population and Hankin (2006) reported that although gender differences in depressive disorders mostly emerge in the ages of 12 to 13, females are at increasing risk for depression as they progress through adolescence, converging on their 2 fold risk, relative to males, for depression in adulthood.

Some psychological theories have shown that gender variance in depressive disorders in young persons suggest that gender differences could be partially attributed to the higher level of stressors that young females are exposed to, both cultural and other, on a routine basis (Dunn et al., 2012).

There are also studies which show that female adolescents in western countries are more vulnerable to the quality of their relationship to their parents, than males (Lewis et al., 2015a,b,c), and that early stress exposure may have a long term impact on children and young adolescents' depression (Lewis et al., 2014b,2015a,b,c; Lewis and Olsson, 2011).

It looks as if the higher levels of depressive symptoms observed in female children and adolescents may reflect the additional stressors involved in the transition from primary school to high school, combined with the onset of puberty. Another explanation is that the higher levels of some stressors associated with everyday life in developing countries, compared to developed countries, may significantly contribute to vulnerability to depression (Lambert et al., 2015).

In this area, Naninck et al. (2011) reported that potential factors that have been identified to account for gender differences in depressive prevalence include biological factors (for instance differing interaction of sex steroids with stress systems and neurotransmitters), psychosocial variables (for example gender-specific expectations, greater cultural

barriers for females in accepting physiological changes associated with adolescence), and stress exposure (e.g. greater probability of females being exposed to various stressors which predisposes them to depression).

The findings of the present study may suggest that in developing countries, gender differences in adolescent depressive prevalence may not be as pronounced as in developed countries because juveniles of both sexes (male or female) experience a higher level of stressors and other depressive triggers on a regular basis. Culturally, there are different specific reasons in Iran which impact differently on male and female adolescents in terms of vulnerability to depression. First, while professional or educational stress is a pronounced feature of depression among males, females may experience depressive symptoms for other reasons (especially in rural regions), including pressure from parents forces to marry in early age and social and parental restrictions on socializing.

According to our findings, those with no history of psychiatric hospitalization of the father or mother (OR = 0.34) were less likely diagnosed with depression than those with this history, which means that the previous history of any psychiatric disorder in parents does not necessarily predispose a person to develop depression. In contrast, a previous study showed that there was an association between the history of hospitalization of the father or mother and depression in children and adolescents. For example, it has been reported in a study that both stress at school and in family as well as a family history of mental illnesses have been identified as risk factors for depression (Grover et al., 2010). Rizzo et al. (2017) reported that depression is significantly correlated with a positive family history of depression and Kalinowska et al. demonstrated that one of the main risk factors for children and adolescents was family history of depression (Kalinowska et al., 2013). These inconsistent findings across studies may be due to one or more of the following factors: suffering from mental disorders such as depression is a complex and includes cognitive, physical and social status; hence, as mentioned, depression can be affected by another factors such as age and gender. Therefore, it can be stated that those with a family history of mental disorders are more vulnerable to be suffered from depressive disorders.

According to our findings, samples with depression displayed a prevalence of symptoms of another mental disorder, ranging from 0.1% for autism and encopresis to 28.1% for Oppositional Defiant Disorder. Previous studies illustrated that depressive disorders and psychiatric disorders were comorbid in children and adolescents. Ying et al. (2013) reported that the prevalence rates of probable PTSD and depression were 8.6 and 42.5%, respectively. Depression is common in patients with Tourette syndrome and occurs significantly more in Tourette patients than in controls. Depression is significantly associated with Tourette factors such as tic severity, comorbidity with ADHD, the presence of coexistent anxiety, and behavior problems. Interestingly, depression in our samples was not related to obsession or compulsion (Rizzo et al., 2017). Ranoyen et al. (2018) described that depression and anxiety are often comorbid disorders. According to their results, anxiety can be predicted by depression (OR = 1.92), more specifically social anxiety and phobic anxiety disorders (OR = 2.14 and 1.83 respectively) in adolescence and young adulthood. Also several previous studies indicated that there were associations between depression and GAD in population samples (Benjamin et al., 2013; Wittchen et al., 2000).

The findings revealed that father's unemployment increased the odds of depression (OR = 1.59), and mother's unemployment (housewife) significantly reduced it (OR = 0.66) [in comparison to the children of mothers who work in the public sector]. Consistent with results, previous studies indicated that father's unemployment was an important predictor of mental health and well-being of females and males aged between 14 and 22. Therefore parental unemployment is negatively associated with teenage mental health, and this correlation remains even when the social level and financial pressure are taken into

account (Sleskova et al., 2006).

Also Mörk et al. (2014) have reported that having an unemployed parent is associated with, on average, a 1% higher likelihood of having to stay at least one night at a hospital in the same year. Pieters and Rawlings (2016) reported that unemployment of the father reduces the child's mental health whereas the mother's unemployment is beneficial for the mental health of the child. Also analysis shows that unemployment of mother or father have different impacts on income, time use and certain health investments such as children's diets (Pieters and Rawlings, 2016). One explanation for our finding is that income of family drops rather dramatically as a parent (especially father) becomes unemployed and that parental health deteriorates in relation to the first unemployment period and declined family income, and deteriorating family health is the possible process through which father's unemployment affects child health.

The findings of our analyses indicated that depression likelihood increased with age until it peaked at the ages of 15 to 18 (OR = 4.4; 95% CI = 3.38–5.83). Lambert et al. (2015) reported that adolescents experience strong pressure in a competitive educational system. Avenevoli et al. (2015), in a survey on adolescents aged between 13 and 18 years, reported that the prevalence of Major Depression Disorder increased significantly across adolescence, with markedly greater increases among females than among males.

Likewise, students in the Iranian education system faced an increased level of academic pressure from the age of 13 due to the commencement of annual exams.

Finally results showed that the various levels of mother's and father's education and the place of residence weren't risk factors for depression. Our findings aren't consistent with prior research indicating that there is a strong association between parental education and parent-reported child mental health, and that this is indeed stronger than that for income and social class (Sonego et al., 2013). Also, according to Sonego & Sigon, it is not clear whether the father's and mother's education levels are equally important for the child's mental health (Sonego et al., 2013). And finally Nasreen et al. (2016) reported that the prevalence of depressive symptoms among children and adolescents was 14%, with predominance in urban areas and among girls. It seems that in our research among children and adolescents, the impact of parental education or place of residence would raise to be outweighed by other factors such as age, gender, circumstance of school, peers, family income, social class etc. Also the inconsistent results come from cultural variations. Cultural differences in the interpretation which possess different meanings in different cultures and nations are always a consideration in any cross-national research.

4.1. Strengths

Interpretation of our results should take into account the study's strengths and limitations.

The present study had several strengths including: First, to obtain a large sample, we assessed depressive symptoms via semi-structured clinical interviews, rather than by self-report questionnaires and these instruments (K-SADS) have satisfactory psychometric properties. Second, participants in this study were a random sample from 30 provinces of Iran and, as a result, the findings of the present study could be generalized to other children and adolescents in Iran.

By controlling for ethnicity, gender, maternal or paternal hospitalization, and other demographic variables, we generally accounted for the possible influence of these factors on child and adolescent depression.

4.2. Limitations

The main asset of this study is the representative, population-based design with a validated questionnaire. Limitations are the cross-sectional analysis, which does not enable analyses of possible causal

associations. Also, part of the results are based on parental appraisal (depression) and clinical measurement. Moreover, several potential risk factors were not included in the present study. For example, a parenting style indicates that depressive appraisal characteristics (e.g. authoritative, democratic or anarchistic) are linked to a higher risk for depressive symptoms than any other characteristics (e.g. place of residence or history of psychiatric disorders, etc.). Such variables should be consistently included in the next studies.

5. Conclusions

Despite these limitations, the present study expanded our knowledge on depressive symptoms as well as their risk factors among Iranian children and adolescents (aged 6–18 years). First, our results suggested that age and gender were risk factors for depressive symptoms. Second, the prevalence of depression was higher among females.

Last, several factors such as job status of parents were also important for the maintenance of depressive symptoms. These findings should be of help to mental health service providers to understand children and adolescents to provide them with a systematic and planned developmental intervention. This study utilized a standardized research method to evaluate the predictors of multiple adolescent/child and adolescent psychopathology.

Additional research in these areas would be of value. The present study hopes to provide a useful template for continued national studies of depression prevalence. Researchers should strive to evaluate depressive symptoms in children and adolescents to reduce the likelihood of other future problems and possible recurrent psychiatric disorders.

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Conflict of interest

The authors declare no conflict of interest.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.jad.2019.01.005](https://doi.org/10.1016/j.jad.2019.01.005).

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