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Original Article

Epidemiology of Psychotic Disorders Based on Demographic Variables in Iranian Children and Adolescents

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Abstract

Objective: Psychosis is still among the most debilitating and severe mental disorders. The main objective of the present study was to investigate the estimated prevalence of psychotic disorders and finding the main predictors of psychotic disorders among Iranian children and adolescents.
Method: Our total sample consisted of 30 553 individuals (49% males and 51%females) from 30 provinces of Iran, aged between 6 and 18 years, who were selected via cluster sampling method from rural and urban areas of all provinces. The data were analyzed using descriptive statistical analysis and multiple logistic regression method.
Results: The results of multiple regression analysis showed that prevalence estimate of psychotic disorders was 0.25%. It was 0.3% and 0.2% in males and females, respectively. The age of 10-14 (OR = 2.24; 95% CI, 1.11-4.55) and the age of 15-18 (OR = 3.42; 95% CI, 1.74-6.75) were significant positive predictors, whereas none of the demographic variables were predictors for psychotic symptoms.
Conclusion: This research highlights the main predictors of psychosis in children and adolescents. The study design also allowed a better understanding of predictors of psychotic disorders. The assessment of the prevalence of psychiatric disorders, particularly their comorbidities, may help to prevent mental illnesses in children and adolescents.

Key words: *Children and Adolescents; Epidemiology; Psychotic Disorders*

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Schizophrenia spectrum disorder and other psychotic disorders include schizophrenia, other psychotic disorders, and the schizotypal personality disorder. They are diagnosed by the existence of symptoms in one or more of the 5 aspects. These symptoms include hallucination, delusion, disorganized behavior or thinking, and abnormality in motor behavior such as catatonia and negative symptoms (1, 2). Certain negative symptoms, such as the inability to speak, inflexible states, and social withdrawal symptoms, can overlap with or erroneously suggest depression .

The occurrence of adolescent-onset schizophrenia is not as well established; however, up to one fifth of adults who were diagnosed with schizophrenia became afflicted with this disorder before the age of 18 (3).

Several studies have shown that 90% of adolescents who contemplate suicide have a mental illness, and more than 30% of schizophrenic patients have suicide ideation during their lifetime. Also, parents are often concerned that children who manifest delusions or hallucinations might have psychotic disorder (4, 5).

According to the research results published by Sharifi et al, a 12-month psychotic disorder was observed in 0.5% of the Iranians aged between 15 and 64 years (6).

In addition, it complicates the clinical understanding of psychotic disorder, and understanding the boundaries of this disorder shows a basic pattern in the development of psychotic disorders and comorbidities (7).

A various range of clinical diagnoses, such as ADHD, oppositional defiant disorder (ODD), anxiety, depression, conduct disorder, and autism spectrum disorders (ASD), may precede the diagnosis of schizophrenia in children and adolescents (8).

Demographic characteristics and gender aspects of findings in psychotic disorders suggest that males with lower educational level are correlated with a greater risk Factor for addiction to substance (9).

Several factors in the social surroundings have been correlated with an increased risk for psychotic disorder. Among these, early life difficulty is one of the most widely studied social factors related with the development of psychosis (10, 11).

Many studies have revealed that early events, including prenatal infections and nutrition, maternal substance abuse, early life stressors, and obstetric difficulties, are more common in persons with schizophrenia than the general population (12, 13).

Several paths of evidences indicate an association between trauma and psychosis. First, studies have cited a high incidence of trauma during the lifetime of psychotic patients (14).Also childhood abuse was a considerable predictor of hallucination, even in the absence of adult abuse (15). Second, in patients with other diagnoses, a history of child abuse has also been found to co-occur with a high frequency of hallucinations and auditory delusions (16).

According to previous studies, childhood events, like all dimensions of behavioral abuse, can predict and be effective on psychotic experiences in the future (17).

In a recent study, in an epidemiological study, Bebbington et al revealed that the risk of meeting the diagnostic criteria for schizophrenia increases by a factor of 15 in individuals who had experienced childhood sexual abuse (18).

Mental Health Epidemiologic surveys found that there was a prevalence range of 28% to 63% for panic attacks in patients with schizophrenia. Further studies reported a lifetime odds of more than 35 for panic disorder in (compared with those without) a diagnosis of schizophrenia (19-22).

Posttraumatic stress disorders are popular in persons with schizophrenia, and childhood trauma is a main risk factor for psychosis. Considering psychosis-related symptoms or experiences, a prevalence of 0%- 67% was found for PTSD among patients with psychosis (23, 24).

Results of studies showed 12.5-fold odds of having OCD given a diagnosis of schizophrenia. In return, another study that was based on this survey revealed a 3.77-fold risk of schizophrenia among persons with OCD, suggesting that for some patients, the presence of OCD may be part of the prodromal of psychosis (19, 25).

The current study assessed a large sample of Iranian adolescents and children living in Iran. The study was done using the data of the study on Iranian Children and Adolescents Psychiatric disorders (IRCAP), which used a standardized research design to evaluate the levels and predictors of the main psychiatric problems (such as psychotic symptoms) in the Iranian child and adolescent population.

The epidemiological researches are very crucial to determine the prevalence, main factors, and effective strategies to prevent, detect, and treat mental disorders (especially psychotic disorders) in children and adolescents. There were no studies to appraise these epidemiological factors in Iranian children and adolescents.

We performed this cross-sectional study to respond to 3 research objectives. The first aim of this study was to survey the epidemiology of schizophrenia spectrum and other psychotic disorders in children and adolescents; the second aim was to define the comorbidity patterns of psychotic disorders in the samples; and the final aim was to predict psychotic symptoms by demographic characteristics, including gender, age, and other demographic variables.

Materials and Methods

Study Population

Overall, the participants included 30553 Iranian children and adolescences, aged between 6 to 18 years. They were selected by the multicluster random sampling method from July 2016 to May 2017. The data were collected as part of a project conducted by the National

Institute for Medical Research Development (NIMAD); Grant number: 940906.

Lifetime schizophrenia spectrum and other psychotic disorders were assessed according to the DSM-IV-TR by means of the Schedule for Affective Disorders and Schizophrenia (K-SADS-PL)(26). This is the first study ever in which a full, semi-structured psychiatric interview has been administered to a representative sample of the Iranian population aged 6 to 18 years (N = 30553) and over by 250 trained clinical psychologists. The inclusion criteria included age 6-18 years and Iranian nationality. Also, participants were excluded if they or their care givers had disabilities that prohibited them from sufficiently completing the questionnaires, including developmental or learning disorders.

Diagnostic Assessment and Instrument

Schedule for Affective Disorders and Schizophrenia for Kids (K-SADS-PL)

K-SADS, the Schedule for Affective Disorders and Schizophrenia for School-Age Children (Present and Lifetime Version), which was introduced by Kaufman et al, is a semi-structured psychiatric interview that is based on the DSM-IV criteria (27).

The kappa for all K-SADS-PL definite DSM diagnoses was between 0.80 and 0.90 (28).

The Persian version of K-SADS has sufficient negative and positive predictive validity for nearly all of the disorders, such that its external reliability(test-retest) and inter-rater validity were 0.81 and 0.69, respectively (29).

Procedures

Participants were interviewed at home by trained clinical psychologists. Interviewers were employed by medical universities in each of the provinces. Our clinical psychologists used K-SADS in their interviews. Also, demographic information, such as information about sex, age, education, work experience, parents' job and parent's education, was collected. Participants were informed about the aims of the study and were informed that participation in this study was optional and that they had the right to leave the study at any time. Additionally, all participants gave consent form.

Data gathering was exactly supervised by either a psychiatrist or a clinical psychologist.

To encourage participants, the collaborating research centers provided psychiatric treatments for those children and adolescents who were diagnosed with a psychiatric disorder.

Statistical Analysis

Statistical significance was accepted when the P value was less than 0.05 (double- sided). Statistical analysis was performed with the IBM $SPSS_{22}$ software. Multiple logistic regression analyses were performed and the odds ratio was calculated to determine which variables were statistically significant predictors of psychotic disorders across the diagnostic groups. For data analysis, all variables that have been obtained from interviews or questionnaires and that could have an effect on psychotic disorder were selected. Then, the univariable analysis was performed and crude OR was calculated. After that, variables (P- values < 0.2) were recruited and the multivariate analysis was estimated. Finally, the variables were significant (P values < 0.05) in the model were interpreted with adjusted OR.

Ethical Approval

This study was approved by the NIMAD (National Institute for Medical Research Development), Grant number: 940906, and the PPRC (Psychiatry and Psychology Research Center) of the Tehran University of Medical Sciences.

Results

In total, 30553 individuals participated in this national epidemiological study. Social demographic information consisted of gender, age, type of settlement, father and mother's level of education, and fathers and mother's occupation, and history of psychiatric hospitalization. Participants' age ranged from 6 to 18 years. Also, 49% of participants were male and 51% were female. A total of 24 919 participants (83.4%) lived in urban areas. Table 1 summarizes the characteristics of the participants based on the demographic questionnaires. It also shows the rate of schizophrenia spectrum disorder and other psychotic disorders based on demographic characteristics .

The total prevalence rate of psychotic disorders was 0.25%; and 0.3% and 0.2% were the prevalence rates for males and females, respectively. Results showed that prevalence rates were 0.1% for those living in rural areas and 0.3% for those who lived in urban areas (Table 1).

Results from the logistic regression analysis are presented in Table 2. The likelihood of schizophrenia and other psychotic disorders increased with the increase in age until it peaked at the ages of 15 to 18 (OR = 3.42; 95% CI = 1.74.38-6.75). Also, based on logistic regression interpretations (multivariable analysis), after controlling for the effects of effective variables (eg, age, sex), the rural type of settlement reduced the odds of schizophrenia and other psychotic disorders (it had a negative effect, OR = 0.24). Also, results revealed that none of the variables of sex, father's, and mother's level of education and father's and mother's history of psychiatric hospitalization had a significant effect on the risk of the occurrence of psychotic disorders. Also, the results of the multivariate logistic regression analysis showed that gender (female or male) was not significant in the logistic regression equation (OR = 0.74, P value = 0.23).

Based on the results of this study, 25.3% of psychotic participants had the depressive disorder and 52% of psychotic participants had the total behavioral disorders (Graph 1). The results revealed that 20.9% of boys and 31.3% of girls with psychotic disorder had depression. Also, 9.1% of participants with psychotic disorders in the 6-9 age group, 25.9% of those in the 10-14 age group, and 29.7% of those in the 15-18 age group had

comorbid depression. Table 3 shows the rates of comorbidities of psychiatric disorders with psychotic disorders.

We found a significant comorbidity between psychotic disorders and behavioral disorders in the participants (Graph 2).

Table 1. Distribution of Socio-Demographic Characteristics of the Psychotic Disorders in Iranian Children and Adolescents

Socio-Demographic Characteristics			Total N	Total %	With disorder n	With disorder % (95% CI)
Gender	Boy		14633	49	43	0.3 (0.2-0.4)
	Girl		15251	51	32	0.2(0.15-0.3)
Age	6-9		10176	34.1	11	0.1(0.06-0.2)
	10-14		10456	35	27	0.3(0.2-0.4)
	15-18		9252	31	37	0.4(0.3-0.6)
Type of settlement	Urban		24919	83.4	71	0.3(0.2-0.4)
	Rural		4965	5.3	4	0.1(0.03-0.2)
Father's level of education	Illiterate		1291	4.3	2	0.2(0.04-0.6)
	primary school		4637	15.5	14	0.3(0.2-0.5)
	Middle & high school		6417	21.5	26	0.4(0.3-0.6)
	High School Diploma		8377	28	14	0.2(0.1-0.3)
	Bachelor's degree		6078	20.3	12	0.2(0.1-0.3)
	MSc or higher degree		1974	6.6	5	0.3(0.1-0.6)
	Missing		1110		2	
Mother's level of education	Illiterate		1697	5.7	3	0.2(0.06-0.5)
	primary school		5492	18.4	18	0.3(0.2-0.5)
	Middle & high school		5677	19	14	0.2(0.15-0.4)
	High School Diploma		9639	32.3	21	0.2(0.14-0.34)
	Bachelor's degree		5581	18.7	14	0.3(0.15-0.42)
	MSc or higher degree		991	3.3	2	0.2(0.05-0.7)
	Missing		807		3	
Father's occupation	unemployed		988	3.3	4	0.4(0.15-1.03)
	Labourer		16489	55.2	38	0.2 (0.17-0.32)
	Farmer		983	3.3	0	0
	businessman		1058	3.5	3	0.3(0.09-0.8)
	Retired		1689	5.7	8	0.5(0.24-0.93)
	public sector employee		6651	22.3	17	0.3 (0.16-0.4)
	Teacher		805	2.7	4	0.5 (0.2-1.28)
	faculty member		173	0.6	0	0
	Missing		1048		1	
Mother's occupation	Laborer		981	3.3	4	0.4 (0.16-1.05)
	farmer		16	0.1	0	0
	businessman		220	0.7	0	0
	housewife		24870	83.2	59	0.2 (0.2-0.3)
	retired		217	0.7	1	0.5 (0.08-2.6)
	public sector employee		1638	5.5	6	0.4 (0.17-0.8)
	teacher		1167	3.9	2	0.2 (0.05-0.6)
	faculty member		75	0.3	0	0
	Missing		700		3	
History of psychiatric hospitalization	Father	Yes	425	1.4	4	0.9 (0.4-2.4)
		No	29413	98.4	71	0.24 (0.19-0.3)
		missing	46			
	Mother	Yes	521	1.7	3	0.6 (0.2-1.7)
		No	29303	98.1	70	0.24(0.19-0.3)
		missing	60		2	
Total			29884	100	75	0.25 (0.2-0.3)

Table 2. Odds Ratios (95% CI) for Schizophrenia Spectrum and other Psychotic Disorders

	Variables and their categories		Univariate			Multivariate		
			OR (crude)	CI (95%)	P-value	OR (adjusted)	CI (95%)	P-value
Demographic variables	Sex	male	1.00 Baseline					
		female	0.71	0.45-1.13	0.15	0.75	0.47-1.19	0.23
	Age group	6-9	1.00 Baseline					
		10-14	2.39	1.19-4.82	0.015	2.24	1.11-4.55	0.025
		15-18	3.71	1.89-7.28	0.0001	3.42	1.74-6.75	0.0001
	Type of settlement	Urban	1.00 Baseline					
		Rural	0.28	0.10-0.77	0.014	0.24	0.09-0.67	0.006
	Father's level of education	Illiterate	1.00 Baseline					
		primary school	1.95	0.44-8.6	0.38	2.00	0.46-8.86	0.36
		High school	2.62	0.62-11.06	0.19	2.49	0.59-10.56	0.22
		High School Diploma	1.08	0.24-4.75	0.92	0.95	0.21-4.23	0.95
		Bachelor's degree	1.27	0.28-5.70	0.75	1.08	0.24-4.86	0.93
		MSc or higher degree	1.64	0.32-8.45	0.56	1.35	0.26-7	0.73
	Mother's level of education	Illiterate	1.00 Baseline					
		primary school	1.86	0.55-6.31	0.32			
		High school	1.40	0.40-4.86	0.60			
		High School Diploma	1.23	0.37-4.14	0.73			
		Bachelor's degree	1.42	0.41-4.95	0.58			
		Msc or higher degree	1.14	0.19-6.85	0.88			
	Father's history of psychiatric hospitalization	no	1.00 Baseline					
		yes	3.93	1.43-10.8	0.008	2.67	0.81-8.78	0.11
	Mother's history of psychiatric hospitalization	no	1.00 Baseline					
		yes	2.42	0.76-7.71	0.14	2.10	0.64-6.89	0.22

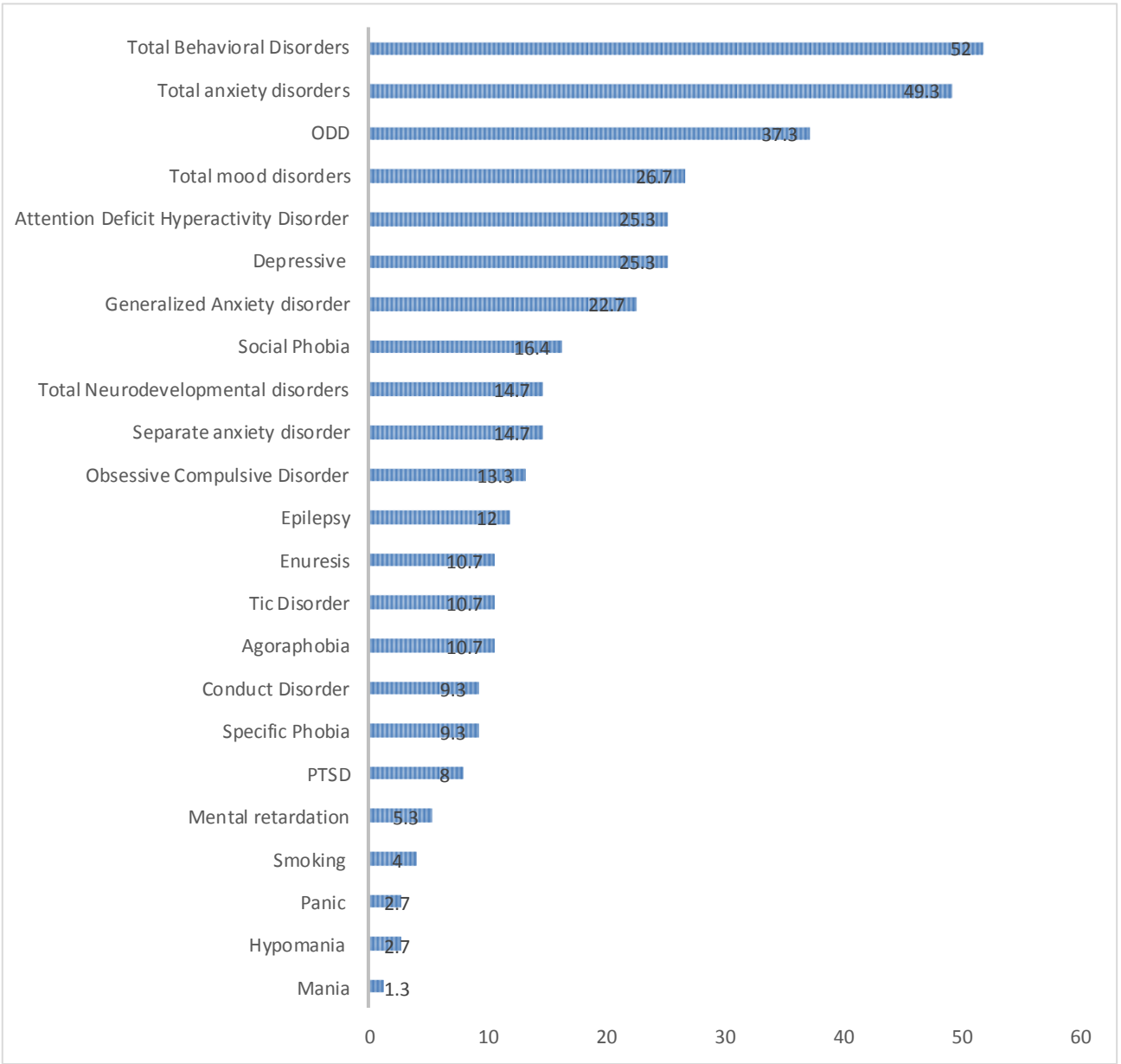
OR adjusted: Odds Ratio
CI: Confidence Interval

Table 3. Rates of Comorbidities of Psychiatric Disorders in Children and Adolescents with the Psychotic Disorder based on Sex and Age Group

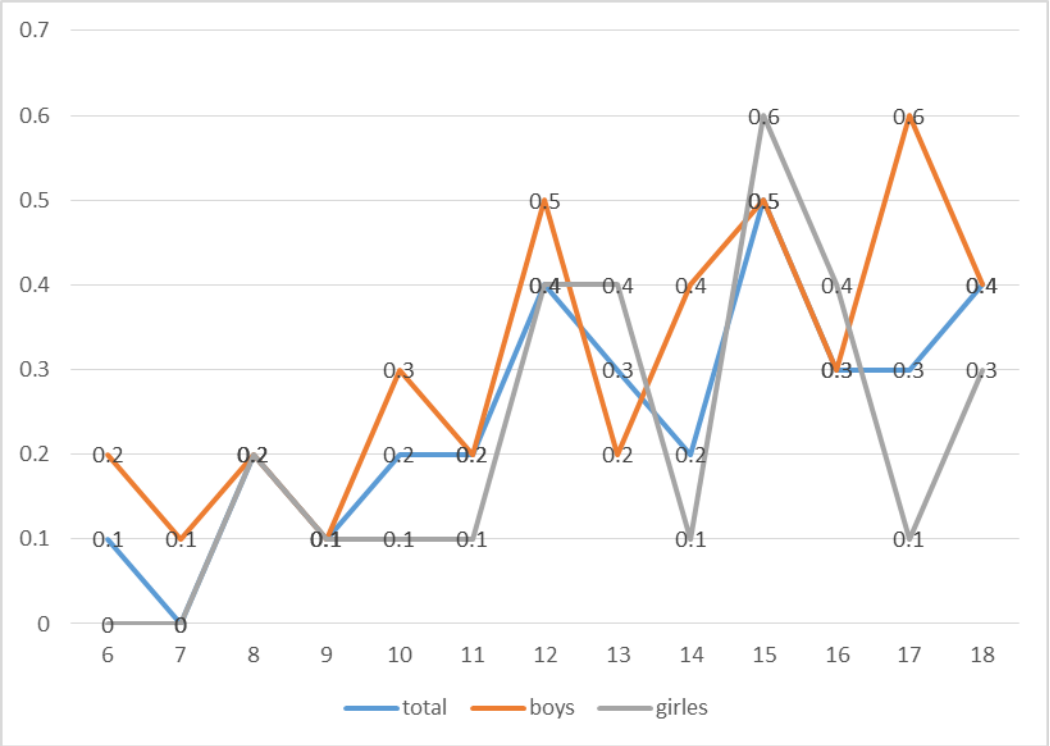
	Psychiatric Disorders		Total		Sex: Male (1), Female (2)			Age group: 6-9(1), 10-14(2), 15-18(3)		
			n(p), (CI)		n(p)	OR(CI)		n(p)	OR(CI)	
Mood disorders	Depressive	19(25.3) (16.9-36.2)		1	9(20.9)	1 baseline	1	1(9.1)	1 baseline	
				2	10(31.3)	1.62(0.56-4.63)	2	7(25.9)	3.32(0.35-31.2)	
							3	11(29.7)	3.81(0.43-33.8)	
	Mania	1(1.3) (0.2-7)		1	0	1 baseline	1	0	1 baseline	
				2	1(3.1)		2	0		
							3	1(2.7)		
	Hypomania	2(2.7) (0.7-9)		1	1(2.3)	1 baseline	1	0	1 baseline	
				2	1(3.1)	1.35(0.08-22.5)	2	1(3.7)		
							3	1(2.7)		
	Total mood disorders	20(26.7) (18-37.6)		1	9(20.9)	1 baseline	1	1(9.1)	1 baseline	
				2	11(34.4)	1.86(0.66-5.26)	2	7(25.9)	3.32(0.35-31.16)	
							3	12(32.4)	4.32(0.49-38.13)	
1	Panic	2(2.7)		1	1(2.3)	1 baseline	1	0		

baseline		(0.7-9)	2	1(3.1)	1.35(0.08-22.5)	2	2(7.4)	
						3	0	
	Separate anxiety disorder	11(14.7) (8.4-24.4)	1	7(16.3)	1 baseline	1	2(18.2)	1 baseline
			2	4(12.5)	0.74(0.19-2.76)	2	6(22.2)	1.29(0.22-7.63)
						3	3(8.1)	0.4(0.06-2.75)
	Social Phobia	12(16.4) (9.4-25.9)	1	7(17.1)	1 baseline	1	1(9.1)	1 baseline
			2	5(15.6)	0.90(0.26-3.15)	2	3(11.1)	1.25(0.12-13.51)
						3	8(21.6)	2.96(0.33-26.8)
	Specific Phobia	7(9.3) (4.6-18.03)	1	3(7)	1 baseline	1	1(9.1)	1 baseline
			2	4(12.5)	1.91(0.39-9.18)	2	3(11.1)	1.25(0.12-13.5)
						3	3(8.1)	0.88(0.08-9.44)
	Agoraphobia	8(10.7) (5.5-19.7)	1	3(7)	1 baseline	1	2(18.2)	1 baseline
			2	5	2.46(0.54-11.2)	2	3(11.1)	0.56(0.08-3.94)
						3	3(8.1)	0.4(0.06-2.75)
Anxiety disorders	Generalized Anxiety disorder	17(22.7) (14.7-33.3)	1	9(20.9)	1 baseline	1	1(9.1)	1 baseline
			2	8(25)	1.26(0.43-3.73)	2	7(25.9)	3.5(0.38-32.5)
						3	9(24.3)	3.2(0.36-28.7)
	Obsessive Compulsive Disorder	10(13.3) (7.4-22.8)	1	4(9.3)	1 baseline	1	1(9.1)	1 baseline
			2	6(18.8)	2.19(0.56-8.54)	2	3(11.1)	1.25(0.12-13.5)
						3	6(16.2)	2(0.21-18.7)
	PTSD	6(8) (3.7-16.4)	1	4(9.3)	1 baseline	1	1(9.1)	1 baseline
			2	2(6.3)	0.62(0.11-3.63)	2	3(11.1)	1.17(0.11-12.8)
						3	2(5.4)	0.54(0.04-6.72)
	Total anxiety disorders	37(49.3) (38.3-60.4)	1	21(48.8)	1 baseline	1	4(36.4)	1 baseline
			2	16(50)	1.07(0.42-2.7)	2	14(51.9)	2.04(0.48-8.71)
						3	19(51.4)	1.96(0.49-7.87)
	Attention Deficit Hyperactivity Disorder	19(25.3) (16.9-36.2)	1	14(32.6)	1 baseline	1	3(27.3)	1 baseline
			2	5(15.6)	0.37(0.12-1.17)	2	11(40.7)	1.83(0.4-8.5)
						3	5(13.5)	0.43(0.08-2.19)
	ODD	28(37.3) (27.3-48.6)	1	18(41.9)	1 baseline	1	3(27.3)	1 baseline
			2	10(31.3)	0.61(0.23-1.59)	2	12(44.4)	2.13(0.46-9.84)
						3	13(35.1)	1.51(0.34-6.7)
	Conduct Disorder	7(9.3) (4.6-18.03)	1	5(11.6)	1 baseline	1	2(18.2)	1 baseline
			2	2(6.3)	0.51(0.09-2.8)	2	3(11.1)	0.56(0.08-3.94)
						3	2(5.4)	0.26(0.03-2.08)
Behavioral Disorders	Tic Disorder	8(10.7) (5.5-19.7)	1	4(9.3)	1 baseline	1	0	1 baseline
			2	4(12.5)	1.29(0.29-5.6)	2	1(3.7)	
						3	7(18.9)	
	Total Behavioral Disorders	39(52) (40.9-62.9)	1	25(58.1)	1 baseline	1	5(45.5)	1 baseline
			2	14(43.8)	0.53(0.21-1.34)	2	16(59.3)	1.74(0.42-7.17)
						3	18(48.6)	1.20(0.31-4.65)
	Mental retardation	4(5.3) (2.1-12.9)	1	3(7)	1 baseline	1	0	1 baseline
			2	1(3.1)	0.43(0.04-4.34)	2	2(7.4)	
						3	2(5.4)	
	Epilepsy	9(12) (6.4-21.3)	1	8(18.6)	1 baseline	1	1(9.1)	1 baseline
			2	1(3.1)	0.14(0.02-1.19)	2	5(18.5)	2.27(0.23-22.1)

					3	3(8.1)	0.88(0.08-9.44)
Total Neurodevelopmental disorders	11(14.7) (8.4-24.4)	1	9(20.9)	1 baseline	1	1(9.1)	1 baseline
		2	2(6.3)	0.25(0.05-1.26)	2	6(22.2)	2.86(0.3-27.03)
					3	4(10.8)	1.21(0.12-12.12)
Smoking	3(4) (1.4-11.1)	1	3(7)	1 baseline	1	0	1 baseline
		2	0		2	1(3.7)	
					3	2(5.4)	
Enuresis	8(10.7) (5.5-19.7)	1	7(16.3)	1 baseline	1	0	1 baseline
		2	1(3.1)	0.17(0.02-1.42)	2	6(22.2)	
					3	2(5.4)	



Graph 1. Rates of Disorders Comorbid with Psychotic Disorders



Graph 2. Rates of Psychotic Disorders Based on Age and Gender in Iranian Children and Adolescents

Discussion

This was a cross-sectional and national study of the prevalence of mental disorders among children and adolescents in Iran (30 provinces). Using the cluster sampling method and valid instruments, this study found the prevalence of psychotic disorders among the 6-18-year-old Iranians.

The total prevalence rate of schizophrenia was 0.25%; it was 0.3% and 0.2% in males and females, respectively. Results showed that the prevalence rate was 0.2% for those living in rural areas and 0.3% for those living in urban areas.

Similarly, a considerable number of researches have studied the prevalence of psychotic disorders in children and adolescents. Driver et al (2013) showed that childhood onset schizophrenia (COS) is an extraordinarily rare sickness with an incidence of less than 0.04%. In both healthy children and children with a variety of other psychiatric illnesses, hallucinations are not uncommon; therefore, diagnosis should not be based on these alone (30). Kelleher et al (2012) cited that the median prevalence of psychotic symptoms among children and adolescents was 17% among children aged between 9-12 years and 7.5% among adolescents aged between 13-18 years. According to their opinion, psychotic symptoms are relatively common in young people, especially in children. Their prevalence is higher in children (9-12 years) compared to (13-18 years) adolescents (5).

Gundersen et al (2018) have reported that the prevalence of PE-S (psychotic experiences based on self-report) was 28.1%, which was higher compared with the 10.2% prevalence for PE-I (based on interview) (31).

The incongruity between the present results and previous studies may be due to the use of different diagnostic instruments and measures to assess psychotic disorders. The fact that the participants of this study were younger than the participants of previous studies may affect our research results.

Our findings revealed that there were no differences between males and females in prevalence rate of psychiatric disorders (0.25% in both genders). This is inconsistent with previous studies which suggested rates of prevalence for psychotic disorders in both genders. For instance, Jenkins et al (2016) reported that psychotic symptoms were more common in females (OR= 1.7) after analyzing the odds ratios that had been adjusted for all variables in the bivariate analysis (32). However, Ndetei et al reported that both psychotic classes had a predominance of male students (33).

The results showed that the occurrence of schizophrenia and other psychotic disorders increased with age until it peaked at the ages of 15 to 18 years (OR = 3.42; 95% CI = 1.74.38-6.75).

Our findings were consistent with other reports. In a study that has been recently published, Rossler et al (2011) have presented the results of their follow-up studies and reported that psychotic symptoms at age 19 or 20 can predict a wide range of (nonpsychotic) mental disorders that may occur 30 years later (34).

Two studies have also reported high rates of psychotic symptoms in adolescents in recent years (age between 14

to 29 years); 1.8% to 19.5% of samples noticed certainty of having had a psychosis risk symptom. In general, 45.5% reported no psychotic symptoms. Females had a higher mean severity score on items evaluating persecutory ideation and auditory hallucinations (33, 35).

McClellan (2018) reported that schizophrenia typically first appears during adolescence and young adulthood, and onset before 12 years of age is rare (36).

It can be inferred that increased risk of psychotic disorders by increasing age has long been correlated with adverse life disadvantages and social events. Individuals experiencing several stressful life occurrences in the past year had increased risk of psychotic symptoms.

The results showed a significant comorbidity in the occurrence of schizophrenia spectrum and other psychotic disorders and behavioral disorders in the samples. Fisher et al (2013) reported that among those with the most severe psychotic symptoms at age 11, 50% had PTSD, substance abuse, and suicide attempts, and only one was free of any diagnosable mental illness (37).

Cochran et al (2013) found that individuals with early-onset schizophrenia frequently have a history of premorbid ASD, and there is evidence of a connection between ASD and SSD that warrants a careful evaluation for comorbidity when the presence of psychosis is suspected (38).

Carlson (2013) reported that psychosis seems to be correlated with severity but people can have equally severe mood episodes and not be psychotic (39).

One study found that schizophrenia can be associated with many psychiatric disorders. Substance or drug abuse comorbidity are more than other disorders. Anxiety or depression are very common throughout the course of illness, with a prevalence of 15%, 29%, and 23% for panic disorder, posttraumatic stress disorder, and obsessive-compulsive disorder, respectively. The comorbidity with depression was seen in 50% of patients, and about 47% of patients had a diagnosis of comorbidity with substance abuse (40).

Rapoport (2009) reported that many individuals with schizophrenia had symptoms suggestive of autism prior to the onset of psychosis. Both disorders stem from disruptions in early brain development and share genetic and neuropathological risk factors (41).

Rössler et al (2011) reported that subclinical psychosis generally represents a risk factor for the development of common mental disorders and a liability for co-occurring disorders. This refers in particular to dysthymia, bipolar disorder, social phobia, and obsessive-compulsive disorder. Proneness to psychosis could signal a fundamental tendency toward common mental disorders (34).

McClellan reported that psychosis is defined by excessive disturbance in thought, perceptions, and behavior. Accurate diagnosis in psychosis is important to remedy and to avoid unreliable labeling, because most people reporting psychotic-like experiences do not have a true psychotic disorder. Also, he claimed that children with other forms of psychopathology, including anxiety, demoralization, and histories of trauma, sometimes express distressful internal experiences, such as hearing or seeing things or having unusual beliefs (36).

Furthermore, Morgan and Gayer-Anderson (2016) reported that the current balance of evidence indicates that childhood adversities, particularly exposure to multiple adversities involving hostility and threat, contribute to the onset of psychotic experiences and psychotic disorders in some people, (42).

We found that symptoms of psychotic disorder indexed particularly high risk for 2 or more co-occurring disorders, such as Axis-I in children and young people aged 6–18 years, suggesting that psychotic symptoms are crucial markers of risk for more severe psychopathology but is not limited to psychosis.

Therefore, schizophrenia and psychotic mood disorders are the most common psychiatric conditions that are associated with another mental illness (43-45). Schizophrenia and bipolar I disorder collectively impact approximately 2 percent of the general population, with peak ages of onset in late adolescence and early adulthood.

The present study had some strengths. One is the utilization of a large sample; 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. Also, in the present survey, psychotic symptoms were evaluated by a trained clinician using the K-SADS-PL questionnaire, which is a valid instrument. It has been carefully checked for content validity within the local cultural context, and it has been tested to make sure it can be a standard interview for the Iranian population. Moreover, all the instruments used in this study and their individual items were reviewed by local clinicians in Iran in 2008 (29) and were considered to have content validity. In addition, the study included the use of household random participation, high response rate, and a systematic approach to assessing sociodemographic and clinical interviews, including screening for psychotic symptoms.

Limitation

Some limitations have to do with the cross-sectional design of the study, which did not allow the analysis of possible causal associations. Another limitation arised because part of the results was based on parental appraisals and clinical measurements. Moreover, several potential risk factors were not included in the present study. For example, time of birth (spring or winter), the child's birth order, history abuse and trauma, and blood poisoning during pregnancy are linked to a higher risk for psychotic symptoms compared to any other characteristics (such as type of location (urban or rural) or history of psychiatric disorders in parents, etc. Such

variables should be taken into account in the next studies.

Conclusion

This research provides an overview of our knowledge on psychotic symptoms, in addition to the risk factors in Iranian children and adolescents aged 6 to 18 years. First, our findings suggested that age was a risk factor for psychotic symptoms and that the rural place of residence decreased the odds of psychotic disorders. Second, the prevalence of psychotic disorders was greater in males than in females, and the reasons for this gender-related difference may deserve further exploration and research.

There is no logical reason for the increase in the rate of psychotic symptoms based on age, and to reduce it, there is a need for more monitoring, evaluation, and management at primary care and clinics the levels. Some progress has already been made to provide continuous professional development on mental health for primary care centers and the health staff of every district, but this needs to be further developed and sustained. Since males are at more risk for psychotic symptoms in this population, an important additional step is to include mental health screening at the stage of postnatal care, especially in children. Assessment and diagnosis of psychosis and schizophrenia in children and young people can be challenging because it has to take into account developmental factors and potential differential diagnoses and comorbid conditions, which differ from those in adults .

The onset of such symptoms during childhood has significant effects on normal development. While primary psychotic disorders are not as common in prepubertal children, their prevalence, including that of prodromal symptoms, increases significantly during adolescence and the transitional age period (15–18 years). According to the results of the present study, psychiatrists and other mental health professionals are expected to receive more comprehensive information about the history of the development of psychiatric disorders and to achieve a more coherent diagnosis and treatment.

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Conflict of Interest

The authors declare that they have no conflict of interest related to the research reported in this manuscript.

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