

## The Epidemiology of Psychiatric Disorders in Children and Adolescents in Mazandaran Province

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### ABSTRACT

**BACKGROUND AND OBJECTIVE:** New information on the epidemiology of psychiatric disorders in children and adolescents is essential for planning and management of health system. Despite the significance of recognizing the health status of children and adolescents, the prevalence of psychiatric disorders in children and adolescents in Iran has not been systematically investigated. This study, which is part of the National Survey of Iranian Children and Adolescents (IRCAP), examines the prevalence of psychiatric disorders in children and adolescents in Mazandaran province, northern Iran.

**METHODS:** In a cross-sectional survey, 1051 children and adolescents residing in Mazandaran, aged 6 – 18 years, were selected by multistage cluster random sampling. In addition to demographic data, the Persian version of K-SADS-PL (Schedule for Affective Disorders and Schizophrenia for School-Age Children--Present and Lifetime Version) was used to assess psychiatric disorders based on Axis I of the DSM-IV.

**FINDINGS:** The overall prevalence of psychiatric disorders is 18% (20.42 – 15.78), mood disorders is 2% (3.15 – 1.38), psychotic disorders is 0.1% (0.2 – 55.02), anxiety disorders is 10.4% (12.8 – 36.67), separation anxiety disorder is 4.6% (6.3 – 01.46), post-traumatic stress disorder (PTSD) is 0.3% (0.8 – 0.1), behavioral disorders is 5.1% (6.3 – 65.96), attention deficit hyperactivity disorder (ADHD) is 2.9% (4.16 – 2.09), conduct disorder is 2.0% (0.0 – 8.1), neurodevelopmental disorders is 2.1% (3.1 – 15.38) and mental retardation is 0.8% (1.4 – 49.0). 42.9% of the cases with depressive disorders also have anxiety disorders. 17.4% of anxiety disorders are associated with behavioral disorders.

**CONCLUSION:** According to the results of this study, psychiatric disorders are considerably common among children and adolescents in Mazandaran. Anxiety disorders are the most common and psychotic disorders are the least common group of psychiatric disorders. Separation anxiety disorder is the most common and post-traumatic stress disorder (PTSD) is the least common anxiety disorder. Attention deficit hyperactivity disorder (ADHD) is the most common and conduct disorder the least common behavioral disorder. Among psychiatric disorders, the highest comorbidity is between depression and anxiety disorders.

**KEY WORDS:** *Psychiatric Disorders, Children, Adolescents, Mazandaran.*

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## Introduction

In recent decades, the number of children and adolescents with psychiatric diagnoses has been increasing (1–3). The importance of new information on the epidemiology of psychiatric disorders in children and adolescents for health system planning and management has prompted numerous studies worldwide (4, 5). In a national survey in the US, the lifetime prevalence of anxiety disorders was 31.9%, behavioral disorders was 19.1%, mood disorders was 14.3%, and substance use disorders was 11.4%. Furthermore, according to the survey, about 40% of adolescents with one the categories of psychiatric disorders also have comorbid disorders (4).

In a survey in Uganda, the prevalence of psychiatric disorders in children and adolescents was 38.5%, depressive disorders was 11.6%, psychotic disorders was 2.2%, anxiety disorders was 27.6%, drug and alcohol use disorders was 1.8%, behavioral and developmental disorders was 4% and eating disorders was 0.9% (6). The prevalence of psychiatric disorders in children and adolescents was reported to be 38.3% in Chile; the prevalence was higher in girls compared to boys and was higher in children compared to adolescents. The prevalence of anxiety disorders was 18.5%, mood disorders was 6.1%, disruptive behavior disorders was 21.8%, substance use disorders was 4.8% and schizophrenia was 0.2% (7).

Wagner et al. (2017) in Austria reported the point prevalence and lifetime prevalence of psychiatric disorders in children and adolescents to be 23.9% and 35.8%, respectively. The lifetime prevalence of anxiety disorders was 15.6%, neurodevelopmental disorders was 9.3% and depressive disorders was 6.2%. About 47% of adolescents have comorbid disorders (5). According to a meta-analysis by Polanczyk et al. (2015) on the results of 41 studies in 27 countries around the world, the prevalence of psychiatric disorders in children and adolescents was estimated to be 13.4%, anxiety disorders was 6.5%, depressive disorders was 2.6%, major depressive disorder was 1.3%, ADHD was 3.4%, disruptive disorders was 5.7%, oppositional defiant disorder was 3.6% and conduct disorder was 2.1% (3).

In Iran, Namdari et al. reported the prevalence of ADHD to be 3.17% (4.9% in boys and 1.5% in girls) in Khorramabad (8). Bagheri et al. reported the overall prevalence of psychiatric disorders to be 14.2% in Mashhad. They reported ADHD with a prevalence of 7.8% and ODD with 6.3% as the most common

disorders. Furthermore, except for the anorexia nervosa that was more prevalent in girls, there was no significant difference in the prevalence of psychiatric disorders between the two genders (10). Zarea et al. reported the prevalence of ADHD to be 8.62% (12.55% in boys and 4.53% in girls) in Hamadan (11). Heidarizadeh et al. reported the overall prevalence of social anxiety disorder to be 18.80% (16.35% in boys and 21.30% in girls) in Kermanshah (15).

Evaluation of the epidemiologic studies of psychiatric disorders in children and adolescents in Iran indicate that there are defects that cause difficulties in comparing the results and their generalization to society, which is the result of different research methods, small samples, non-random sampling, use of different and non-standard tools, questionnaires that are completed by parents or questionnaires that are self-report versus clinical interviews, examination of a small number of disorders, analysis of different types of prevalence (point or lifetime), considering extensive confidence intervals in statistical analysis and other methodological problems (9).

Given the lack of accurate and up-to-date information on the prevalence of psychiatric disorders in children and adolescents in Iran, the National Survey of Iranian Children and Adolescents (IRCAP) is aimed at providing an accurate, standard, global, and coordinated assessment of psychiatric disorders in children and adolescents in Iran. As part of this national survey, this study examines the epidemiological findings of psychiatric disorders in children and adolescents in Mazandaran province.

## Methods

This research is a cross-sectional survey and part of a national plan with code of ethics IR.NIMAD.REC.1395.001, sponsored by the National Institute for Medical Research Development (NIMAD), which is implemented in all provincial centers of the country and examines the prevalence of psychiatric disorders in children and adolescents aged 6 to 18 years. Therefore, the present sample size is also considered according to the requirements of this project.

Assuming that the prevalence of psychiatric disorders was 0.3, type I error was 0.05, accepted error was 0.05, and cluster sampling effect was 1.2, the final sample size was 990 (1000) people in each province and 31,000 people in the whole country. Multistage cluster

sampling was used in this study. Clusters and samples were randomly selected according to zip code. 167 clusters and 6 samples from each cluster were selected from both urban and rural populations. The inclusion criteria were children in the age range of 6 to 18 years. The exclusion criteria were lack of cooperation by families or any problem that prevented attaining enough information about the child's psychological assessment. In addition to demographic data, the research tools included age and gender, interview was done using K-SADS-PL (Schedule for Affective Disorders and Schizophrenia for School-Age Children--Present and Lifetime Version), which is a semi-structured interview. It is designed to evaluate current and previous episodes of psychiatric disorders in children and adolescents (6–18 years) based on DSM-IV (12).

Early diagnoses include all psychiatric disorders of Axis I (13). The process of completing the questionnaire consisted of the following sections: 1) unstructured introductory interview 2) diagnostic screening interview 3) supplement completion checklist 4) diagnostic annexes 5) the summary lifetime diagnostic checklist and 6) The Children's Global Assessment Scale (CGAS). The validity and reliability of the Persian translation of this questionnaire have been reviewed and validated (13, 14).

The interviewers with Masters of Clinical Psychology were trained for the above interview and were supervised by psychiatrists at various stages. Initially, K-SADS was individually completed by each of the well-informed people and after collecting data and resolving inconsistencies, the Summary Lifetime Diagnoses Checklist and the Child Rating Scale were completed.

Final diagnoses were proposed based on information obtained from interviews with parents, children, and summarizing data from all available sources. The data were analyzed by SPSS-25 software using frequency, frequency percentages, confidence intervals, odds ratios, and significance levels for demographic variables and psychiatric disorders.  $P < 0.05$  was considered significant.

## Results

In this study, 1051 people were examined, 50.8% of whom were girls. 33.6% were in the age group of 6–9 years, 33.4% were in the age group of 10–14 years, and 33% were in the age group of 15–18 years (Table 1). The overall prevalence of psychiatric disorders in 189

patients was 18% (18.8% in 97 boys and 17.2% in 92 girls). The prevalence was 19% in 67 patients in the age group of 6–9 years, its was 18.2% in 64 patients in the age group of 10–14 years and was 16.7% in 58 patients in the age group of 15–18 years (Table 1).

**Table 1. Frequency of demographic variables in children and adolescents (6–18 years old) in Mazandaran province and prevalence of psychiatric disorders based on the levels of these variables**

Variables	Group	Total N(%)	With disorder N(%)	CI-95%
Gender	Male	517(49.2)	97(18.8)	15.63-22.32
	Female	534(50.8)	92(17.2)	14.26-20.66
Age group	6–9	353(33.6)	67(19)	15.23-23.4
	10–14	351(33.4)	64(18.2)	14.54-22.61
	15–18	347(33.0)	58(16.7)	13.15-21.0
Total sample		100(1051)	189(18)	15.78-20.42

The odds ratio for psychiatric disorders was not significantly different between genders and age groups (Table 2). The prevalence of mood disorders was 2.0% in 21 patients, psychotic disorders was 0.1% in one patient and anxiety disorders was 10.4% in 109 patients. The most common anxiety disorder was separation anxiety disorder in 48 patients (4.6%). The least common anxiety disorder was PTSD with 3 cases (0.3%).

The prevalence of behavioral disorders in the present study in 54 patients was 5.1%. Regarding the behavioral disorders, the highest prevalence was related to ADHD (2.9%) in 31 patients and the lowest prevalence was related to conduct disorder (0.2%) in 3 patients. Only 4 people (0.4%) of the total sample were smokers. The prevalence of neurodevelopmental disorders in the present sample was 2.1% in 22 patients and mental retardation was 0.8% in 8 patients. The prevalence of mania, hypomania, alcohol and substance abuse, autism, fecal incontinence, anorexia and bulimia nervosa is zero (Table 3).

42.9% of cases with depressive disorders have at least one type of anxiety disorders. 17.4% of anxiety disorder cases are accompanied by behavioral disorders. The most common comorbid disorders for behavioral disorders are anxiety disorders (35.2%). 18.2% of neurodevelopmental disorder cases also have anxiety disorders. In 19% of cases, enuresis was comorbid disorder of anxiety disorders (Table 4). Overall, 45.9% of children and adolescents have more than one simultaneous psychiatric disorder.

**Table 2. The odds ratio of psychiatric disorders in different classes of demographic variables**

Demographic variables		Odds ratio (raw)	CI-95%	P value	Odds ratio (adjusted)	CI-95%	P-value
Gender	Male	1.00 base					
	Female	0.90	0.66–1.23	0.52	0.89	0.62–1.27	0.52
Age group	6–9	1.00 base					
	10–14	0.95	0.65–1.39	0.80	0.79	0.52–1.23	0.31
	15–18	0.86	0.58–1.26	0.43	0.75	0.48–1.17	0.21

**Table 3. Prevalence of psychiatric disorders in children and adolescents (6 – 18 years) in Mazandaran province**

Psychiatric disorders		N(%)	CI-95%
Depressive Disorders		21(2.0)	1.38–3.15
Psychotic disorders		1(0.1)	0.4–1.49
Anxiety Disorders	Panic	8(0.8)	0.4–1.49
	Separation anxiety	48(4.6)	3.46–6.01
	Social Phobia	32(3.0)	2.16–4.26
	Specific phobia	29(2.8)	2–4.04
	Agoraphobia	30(2.9)	2.09–4.16
	Generalized anxiety disorder	28(2.7)	3.82–1.85
	Obsessive compulsive disorder	14(1.3)	0.8–2.22
	Post-traumatic stress	3(0.3)	0.1–0.8
	Total anxiety disorders	109(10.4)	8.67–12.36
Behavioral disorders	Attention deficit hyperactivity disorder	31(2.9)	2.09–4.16
	Oppositional defiant disorder	15(1.4)	0.09–2.34
	Conduct	3(0.3)	0.1–0.8
	Tics	12(1.1)	0.65–1.98
	Total behavioral disorders	54(5.1)	3.96–6.65
Neurodevelopmental disorders	Mental retardation	8(0.8)	0.4–1.49
	Epilepsy	18(1.7)	1.08–2.69
	Total neurodevelopmental disorders	22(2.1)	1.38–3.15
Tobacco use		4(0.4)	0.15–0.97
Defecation disorders	Enuresis	42(4)	2.97–5.36
	Total defecation disorders	42(4)	2.97–5.36
Total psychiatric disorders		189(18)	15.78–20.42

**Table 4. Comorbidity of psychiatric disorders in children and adolescents in Mazandaran province**

Disorders	Mood N(%)	Psychotic N(%)	Anxiety N(%)	Behavioral N(%)	Neurodevelopmental N(%)	Substance use N(%)	Defecation N(%)
Mood		1(4.8)	9(42.9)	3(14.3)	1(4.8)	0	3(14.3)
Psychotic	1		0	0	0	0	0
Anxiety	9(8.3)	0		19(17.4)	4(3.7)	1(0.9)	8(7.3)
Behavioral	3(5.6)	0	19(35.2)		2(3.7)	3(5.6)	5(9.3)
Neurodevelopmental	1(4.5)	0	4(18.2)	2(9.1)		0	1(4.5)
Substance use	0	0	0	3(7.5)	0		0
Defecation	3(7.1)	0	8(19)	5(11.9)	1(2.4)	0	

## Discussion

The results of this study show that 18% of children and adolescents in Mazandaran have at least one psychiatric disorder. The only comparable Iranian

research in this regard is the study of Bagheri et al. in Mashhad, which shows lower prevalence compared to the present study (10). However, their sample size was

only 150 people, which is much smaller than the present sample, which may explain this difference. Compared to studies in other countries, the psychiatric disorders in the present sample are less than some studies, such as the Austrian survey (5) and more than some other studies like a global meta-analysis (3); however, due to differences such as the research methods and tools in these studies, such comparisons do not make much sense. For example, the Austrian sample is much larger than the current sample, and they used telephone interviews. In addition, the global prevalence reported by Polanczyk et al. is the result of a meta-analysis that encompasses numerous studies with many differences (3). In the present study, the overall prevalence of psychiatric disorders was not significantly different between the two genders. In this respect, there is no significant difference between the present study and previous studies (10). In some studies, the reported difference between the genders does not apply to all psychiatric disorders, and only to some disorders such as internalizing and externalizing disorders (5, 7, 8). According to the results of this study, anxiety disorders with a prevalence of 10.4% are the most common and psychotic disorders and neurodevelopmental disorders with a prevalence of 0.1% and 2.1%, respectively, are the least common groups of psychiatric disorders in children and adolescents in Mazandaran.

Anxiety disorders are also the most common in most studies; however, less agreement is seen on the least common psychiatric disorder (3–6). Moreover, according to the present results, 45.9% of children and adolescents in Mazandaran have more than one psychiatric disorder at the same time. Anxiety disorders are the most common comorbidities. It is difficult to

compare comorbidity rates in different studies because, regardless of the ones that did not report comorbidity, many of the reported comorbidities are related to lifetime prevalence and comparing them with the comorbidities of the point prevalence is not logical. The limitation of this study is the lack of appropriate internal criteria for comparison due to the lack of adequate and appropriate studies regarding the epidemiology of psychiatric disorders in children and adolescents. However, since the present study is part of a national survey, along with reports from other provinces of Iran, it can provide a broader picture of the prevalence of psychiatric disorders in children and adolescents in Iran and obviate these issues for future research.

According to the results of this study, about two out of every ten children and adolescents in Mazandaran suffer from psychiatric disorders. This noteworthy prevalence is a warning to health policy makers and indicates the need for more attention to mental health and quantitative and qualitative improvement of mental health services in the areas of prevention and treatment. Failure to pay attention to this issue will lead to exacerbated social and economic problems in the long run.

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