

*Original Article***Prevalence of attention deficit/ hyperactivity disorder and associated symptoms among primary school students in the city of Isfahan**

*Mahboubeh Karimi\**, *Mosa Alavi\*\**, *Khosrow Tavakkol\*\*\**, *Fariba Asgari\*\*\*\**,  
*Shayesteh Haqiqi\*\*\*\*\**

**Abstract**

**BACKGROUND:** Behavioral and emotional disorders are common disorders during childhood and adolescents. Attention deficit and hyperactivity disorder (ADHD) is common among children, which result in behavioral problems and weak performance in school.

**METHODS:** A cross-sectional study on 450 primary school students in Isfahan in 2006. Sampling was stratified random and data were collected using Vanderbilt Assessment Scale - Parent Informant.

**RESULTS:** 2.1% of the students had the criteria for attention deficit disorder, 7.7% had hyperactivity disorder and 2.4% had both disorders (ADHD). Also, 5.6% had oppositional defiant disorder (ODD) and 9.1% had criteria of depression and anxiety disorder.

**CONCLUSION:** Primary school students' health leads to the health of society. It is necessary to check up students for common disorders, because if these disorders are not diagnosed and cured on time, may lead to delinquency in adolescence or anti-social personality disorder in adulthood.

**KEY WORDS:** Attention deficit/ hyperactivity disorder, primary school students.

IJNMR 2009; 14(1): 41-44

Behavioral-emotional disorders are among common disorders during childhood and adolescence and continuation of these disorders may compromise psychological health of the family and increase health care expenses.<sup>1</sup> More than one fifth of children and adolescence in the world suffer from mild to severe psychological disorders and just 20% or less receive the psychological health care they need.<sup>2</sup> Attention deficit/ hyperactivity disorder is a complicated psychological disorder and the most common disorder during childhood. This disorder affects not only the child but also the whole family system.<sup>3</sup> Children with this dis-

order are more disorganized and forgetful than other children of their age. Teachers and parents always complain that some children have difficulty in listening to what they say, have no concentration can easily be distracted and change their activities more frequently compared with other children of the same age. These children barely finish any work.<sup>4</sup>

Hyperactivity is beyond being active. Most children are energized, lively, and smart and have lots of activities without making any trouble. Hyperactivity happens just when the child's activity is a chaos, is very difficult to be guided and affects his/her own life and the life

\* MSc, Health Deputy, Tehran University of Medical Sciences, Tehran, Iran.

\*\* PhD student of Nursing, School of Nursing and Midwifery, Medical Education science Center (MERK), Isfahan University of Medical Sciences, Isfahan, Iran.

\*\*\* MSc, Department of Health Nursing, School of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran.

\*\*\*\* MSc, School of Nursing and Midwifery, Ahvaz University of Medical Sciences, Ahvaz, Iran.

\*\*\*\*\* MSc, School of Nursing and Midwifery, Islamic Azad University of Falavarjan, Isfahan, Iran.

Correspondence to: Mahboubeh Karimi MSc.

E-mail: mahhbbob@yahoo.com

Research Article of Isfahan University of Medical Sciences, No:184159

of people around her/him.<sup>5</sup> This disorder appears in preschool age in some children, so it is difficult for them to pay attention and control their behavior.<sup>6</sup> This disorder usually continues through the childhood and adolescence and in more than 70% cases it affects their adulthood life too.<sup>7</sup>

Attention deficit and hyperactivity disorder (ADHD) is characterized by attention deficit or hyperactivity and impulsive behavior, or both of them. The diagnosis criteria for this disorder should continue at least for 6 months. It should affect the social and educational performance and should begin before 7 years old.<sup>5</sup> ADHD affects 8 to 12% of children around the world.<sup>8</sup> The prevalence of ADHD in the US is reported to be between 2 to 20 % in primary school students, but a prudent estimate would be about 3-5% of primary school students in pre-puberty. Among Korean children, the prevalence of this disorder is reported 5.9 to 6.7%.<sup>5</sup> The prevalence in Germany, Brazil and Colombia are significantly lower and in Australia, Ireland, Sweden and Italy are between 4.2 to 5.7%.<sup>9</sup> The prevalence of ADHD in pre-school children in Tehran in 2000-2001 is estimated as 11% and 60% of them were boys.<sup>10</sup>

## Methods

This was a cross-sectional study, carried out in 2006, to determine the frequently distribution of ADHD. The study population included all students in the first to fifth levels of primary school in the city of Isfahan. The sample size was calculated 450 students by the formula for estimating proportion. Sampling was random stratified and from each of 5 school districts in the city of Isfahan and based on their student population, a number of primary schools were selected and from each selected school, a number of students were randomly selected based on the determined proportion. The variables of this study included demographic factors (birth rank, sex, birth weight, school grade, and history of any other diseases in child), family and social factors (parents' education, mother's age at the time of birth, parents' diseases, number of children in the family, mother's daily work hours out of

home, father's daily work hours, parents' career, family income).

Data were collected using the Vanderbilt Assessment Scale—Parent Informant, which is a screening questionnaire. The questionnaire included three sections. The first section was demographic data (individual, family and social data) with closed questions and short answers. The second part included 47 questions about 4 disorders: ADHD, conduct disorder, oppositional defiant disorder, depression and anxiety. The third section was school and classroom performance. To diagnose ADHD, there should be at least 6 answers of often or always (2 or 3 scores) for each of the 9 questions about attention deficit and each of the 9 question on hyperactivity as well as a score of 4 or 5 in the questions of performance (46 to 53). Validity and reliability of the questionnaire was proved by the test-retest with a coefficient of 87%. Data were analyzed using descriptive statistical tests and SPSS software.

## Results

The participants in this study included 450 students of primary schools. 46% were boys and 54% were girls. The age range of the participants was 7 to 12 years and their birth rank was as follows: 46.9% first child, 31.5% second child, and the rest (21.6%) had the third or higher rank of birth. education level of the students' mothers was as follows: 22% at university level, 45% high school diploma, 20% high school, 11% primary school and 2% illiterate. mother's careers: 81% were housewives, 0.5% worker, 14% employee, 4% businesswoman and 0.5% retired. 8.5% of mothers were working less than 30 hours per week and 10% were working between 30 to 60 hours per week.

22% of fathers had university degrees, 45.5% had high school diploma, 2% were illiterate and the rest had some education in primary school or high school. Father's careers: 34% were employee, 42% businessman, 8.5% were unemployed and the rest were worker or retired. 27% of fathers were working less than 50 hours per week, 55% between 50 to 80 hours and 8.5% between 80 to 130 hours per week. 96% of children

were living with parents and in 3.7% of cases parents were living separated. Family monthly income: 16% less than 150 thousand Tumans, 7.41 from 150 to 250, 29% from 250 to 350, and the rest more than 350 thousands Tumans.

The mean scores of attention deficit in the primary school students of Isfahan in 2006 was  $62.2 \pm 4$  and 4% of participants had symptoms of attention deficit (61% boys and 39% girls). The mean score of hyperactivity disorder was  $41.4 \pm 6.5$ . 4.7% of participants had the symptoms of hyperactivity disorder (66% boys and 34% girls). But the mean scores of attention deficit/hyperactivity disorder were  $9.8 \pm 1.8$  and 4.6% of participants met the criteria for this disorder (40% girls and 60% boys).

## Discussion

The results showed that the prevalence of ADHD in children of Isfahan city is 4.6%, while its prevalence in primary school children in Tehran in 2000-2001 was 11%.<sup>11</sup> In a study in Kermanshah in 2000-2001 by Azizi et al the prevalence was reported 4.42%.<sup>10</sup> Also, a study in Italy in 2005 showed that the prevalence of this disorder was 1.7%.<sup>12</sup> The present study showed that 40% of hyperactive children were girls and 60% were boys. This result agrees with the results of a study in Tehran in 2001 in which 60% of hyperactive children were boys.

Azizi et al in their study in Kermanshah reported the prevalence of mainly hyperactive 1.35% and the prevalence of mainly attention deficit 0.67%.<sup>12</sup> While Danial in his study in Italy reported the prevalence of mainly hyperactive 2.3% and mainly attention deficit 3.5%, and the percentage of attention deficit was higher among girls. While in the present study attention deficit hyperactivity disorder is higher among boys. The organization for children health research estimates the prevalence of ADHD in the school children, between 2 to 8% in different societies.<sup>13</sup> The findings of our study showed the same estimation. Moreover, the proportion of this disorder prevalence among boys and girls is 3 to 2. In Azizi et al study this proportion was 1.3 to 3.<sup>10</sup> However, Sadock et al<sup>5</sup> reported a proportion of 3 to 1 which agrees

with the results of our study. It seems that various factors including cultural, social and family factors have a role in the prevalence of this disorder. The difference between the results of this study and Azizi et al study in Kermanshah may be related to different assessment tools. Besides, the present study is just screening and does not talk about clinical diagnosis.

The results of our study showed that 70% of children with ADHD are the first child in family, 30% are second child and latter. A study in Arak in 1996 also showed a significant relation between being the first child and having this disorder.<sup>14</sup> In addition, a study in Kermanshah showed that 40% of children with ADHA, were the first child and 60% were second and latter.<sup>10</sup> In regard to the family income, the income of 50% were between 150 to 250 Tumans. In 60% of subjects' fathers were working out of home more than 8 hours per day and in 30 % of subjects' parents were separated. Ardalan et al study showed a significant relation between attention deficit/ hyperactivity disorder and fathers' long hours of work.<sup>11</sup> Also Bayati et al showed that the long absence of father due to working or separation of parents is, among socio-economic factors triggering ADHD.<sup>14</sup> In the present study there was no significant relation between the symptoms of ADHD and parents' work hours and family income, but there was a significant relation between separation of parents and the disorder symptoms, which is in agreement with Bayati et al study. Biderman et al believed that several factors including parents' severe incompatibility, lower social class, crowded family, undereducated mothers and single parenting are significantly related to ADHD.<sup>12</sup> In our study also some of these factors including separation of parents, undereducated mothers and low level of family income have been seen.

In our study, 30% of children with ADHA had the symptoms of oppositional defiant disorder and 10% had the symptoms of depression and anxiety and 62% of them were boys and 38% were girls. It means that 1.2% of girls and 2.4% of boys participated in this study had the symptoms of this disorder.

A study in Italy showed that 18.2% of children with ADHD had also symptoms of ODD and conduct disorder and 29.6% of them had depressive and anxiety disorder symptoms.<sup>12</sup> Compared with Italy, the prevalence is much lower in Iran and it can be related to geographical and ethnic factors or family stability in Iran which is higher than European countries.

ADHD and its treatment is one of the most important challenging areas in medical and health sciences. It is very important because of the expenses it imposes on the educational system and national economy by causing educational failure as well as social and family problems.<sup>10</sup> If these disorders are not diagnosed and treated on time, may lead to delinquency in adolescence or anti-social personality disorder in adulthood. This disorder has been reported to be the destiny of 25% of children with ADHD and the best treatment is resulted from early

correction of child's aggression and the family reaction.<sup>5</sup>

The health of a society is related to the health of its members. A healthy society tries to provide a situation for its members to insure their physical and psychological health. Students' health guarantees the health of society in future. It is necessary that primary school students are checked up children for ADHD and school nurses (their role is unfortunately forgotten in Iranian society) have a significant role in screening these children and increasing the awareness of the society about this disorder. Diagnosis of children with ADHA as soon as possible and referring them to the professionals for medication and behavioral treatments had a great role in improving children's health.

The researchers declare that have no conflict of interest in this study and they have surveyed under the research ethics.

## References

1. Hashemi R, Hajaran MA, Nejat H. Survey of internal school factors influencing mental health of students. Abstract book of 5<sup>th</sup> congress of mental health and behavioral disorders of children & adolescents. Iran, Zanjan: Zanjan University of Medical Sciences; 2002. p. 69.
2. Kaveh MH. Organizing mental health services in schools and evaluation of teachers' role. Abstract book of 5<sup>th</sup> congress of mental health and behavioral disorders of children & adolescents. Iran, Zanjan: Zanjan University of Medical Sciences; 2002. p. 45.
3. Khoshabi K, Malek Khosravi G. Family Function in children with ADHD. Abstract book of 5<sup>th</sup> congress of mental health and behavioral disorders of children & adolescents. Iran, Zanjan: Zanjan University of Medical Sciences; 2002. p. 23.
4. Mash EJ, Barkley RA. Child psychopathology. Trans. Hasan Tozandeh jani, Kamal poor N, Tavakkoli zadeh J. Tehran: Marandiz; 2004. p. 46.
5. Sadock BJ, Kaplan H, Sadock VA. Synopsis of psychiatry: behavioral science clinical psychiatry. 10<sup>th</sup> ed. Philadelphia: Lippincott, William and Wilkins; 2007.
6. National Institute of Mental Health. Effectiveness of an Extended Release Stimulant Medication in Treating Preschool Children With Attention Deficit Hyperactivity Disorder (The APS Study). [cited 2008 July 8]. Available from URL: <http://www.clinicaltrials.gov/show/NCT00712699>.
7. Kaye DL, Montgomery ME, Munson SW. Child & adolescent mental health. Philadelphia: Lippincott William and Wilkins; 2003. p. 653.
8. Salahshoor M. Knowing ADHD disorder. Peivand Educational Cultural Journal 2005; 312: 41-49.
9. Keltner NL, Scheweke LH, Bostrom CE. Psychiatric Nursing. 4<sup>th</sup> ed. St Louis: Mosby; 2003. p. 342.
10. Azizi B, Jasemi V. Epidemiological survey of ADHD in elementary students in Kermanshah during 1999-2000. [PhD thesis]. Yazd: Yazd University of Medical Sciences; 2000.
11. Ardalan G, Farhood D, Shahmohamadi D. Survey of ADHD in preschool children. Iran Childhood Diseases 2003; 12(4): 53-6.
12. Biederman J, Faraone VS. Attention deficit hyperactivity disorder. Lancet 2005; 360(9481): 237-49.
13. Center for disease control and prevention (CDC). Mental health in the United States; prevalence of diagnosis. MMWR 2005; 54(34): 842-7.
14. Bayati A. Survey of predisposing factors inducing ADHD in elementary school children in Arak. [Thesis]. Tehran: University of Social Welfare and Rehabilitation Sciences; 1996.