

JMS (ISSN 1682-4474) is an International, peer-reviewed scientific journal that publishes original article in experimental & clinical medicine and related disciplines such as molecular biology, biochemistry, genetics, biophysics, bio-and medical technology. JMS is issued eight times per year on paper and in electronic format.

For further information about this article or if you need reprints, please contact:

Mohamad Taghi Badeleh
Faculty Member of Golestan
University of Medical Sciences,
Iran

Attention Deficit Hyperactivity Disorder and Elementary Teachers awareness

Mohamad Taghi Badeleh

About 8.7% of children suffer from Attention Deficit Hyperactivity Disorder and 20 to 30% of them have learning disability. Since elementary teacher is the first one who recognize this problem, we aimed at evaluating Teachers Knowledge about Attention Deficit Hyperactivity Disorder. In this descriptive-analytic study, the subjects were 245 elementary teachers selected via stratified random sampling. Having their consent, they were interviewed using a few open-ended questions validated by psychiatrist and psychologist. We encoded the data, considering DSM IV 18-point criteria and analyzed by descriptive and inferential statistics. Of 245, 190 (77.55%) are state teachers and 55 (22.45%) are non-state teachers. The teachers are males (60; 24.5%) and females (185; 75.5%). One hundred and ten (45.83%) do not know about the cause of this disorder. The mean score of both state (1.91) an non-state (2.18) is very low. There is no significant difference between Teachers knowledge and variables such as school, gender and record of services ($p \leq 0.05$), but it is meaningful for level of education ($p \leq 0.05$). Teachers knowledge results in rapid recognizing of ADHD children and consequently preventing from educational and social difficulties; therefore, we recommend holding some in-service training workshop for teachers.

Key words: Knowledge, inattention, hyperactivity, impulsivity, teachers

INTRODUCTION

ADHD is a quite common disorder in which a child displays hyperactive, impulsive, and/or inattentive behavior (Nass and Leventhal, 2010). In terms of different researches, the prevalence of ADHD has been reported differently. Brown *et al.* (2001) reported it between 4% and 12% among 6-12-year-old children. Spencer *et al.* (2007) in their study estimated the Prevalence of childhood ADHD in the USA 5 to 8%. Kaplan and Newcorn (2011) by quoting Barkli reported 8.7% in America. The rate in Iran was reported significant by Jamali *et al.* (2012) and has been reported differently; for example, by Yoosefi and Yoosefi (1998) 6.2% among the elementary students While by Bahreinian and Maccoo (2000) 19.9% among boys studied in elementary school and by Golmirzaei *et al.* (2012) 20.19%.

The high prevalence of this disorder indicates the leading effect of ADHD on the health and development of community and the possibility of being faced with academic undergrowth in the process of learning in that the National Institute of Mental Health indicates that 20-30% of children with ADHD also have a learning disability and their academic progress is weak at the school. Most of the children who suffer from learning disability are engaged in mental and emotional problems such as anxiety, depression and social disorder (Faraone and Biederman, 1997). Their self-esteem have been found to be impaired (Graetz *et al.*, 2005). Those afflicted with ADHD are more subjected to the danger of smoking and narcotics. In most of the cases, teachers are the first who recognize this disease (Dulcan, 1997)

Since ADHD is a disorder having undesirable effect on the academic achievement of students in the process of learning (Barkley, 2006), teacher plays a main role in helping these students aimed at adapting them with this problem (American Academy of Pediatrics, 1992). In spite of the importance of teachers' knowledge on their supporting behaviors towards preventing the complications of this disorder (Ohan *et al.*, 2008), Unfortunately, teachers' knowledge regarding ADHD is not adequate (Akram *et al.*, 2009; Perold *et al.*, 2010).

This is a hard fact that knowledge is power and any factor resulting in conditions that increase the level of education, surely will upgrade the growth and development of the community. Therefore, the evaluating of teachers' knowledge and holding some specialized workshops will be effective in recognizing and treating of students afflicted with ADHD; On time diagnosis of this disorder can prevent from academic underachievement and social problems of at least 10% of school-aged children.

In light of high prevalence of ADHD in school-aged children, this study aimed at evaluating elementary teachers' knowledge about the Attention Deficit Hyperactivity Disorder and consequently informing both the managers of education centers and elementary teachers.

MATERIALS AND METHODS

In this descriptive-analytic study, the subjects were 245 elementary school teachers of Gorgan city in Golestan province, Iran. They were selected via stratified random sampling, by considering their gender and their school, state and non-state. By having the official consent of the department of Education in Gorgan city, the teachers were interviewed by utilizing open-ended questions based on studying the specialized texts and articles validated by psychiatrist and psychologist. After finishing the interview, the extracted information and the data were encoded by taking in to consideration DSM-IV 18-point-criteria and analyzed by descriptive and inferential statistics.

Data collection instrument: A questionnaire was provided including several open-ended question based on the study of specialized texts and articles validated by psychologist and psychiatrist. It is worth pointing out that for validating the data gathering method, all interviews were performed by only one interviewer. DSM-IV 18-point-criteria were taken in to consideration for measuring the teachers' knowledge regarding the Attention Deficit Hyperactivity Disorder. This criterion has 18 points: less than 6, weak; 6-12, average; above 12, good.

Findings: The total subjects were 245 elementary school teachers. Out of 245, 190 were state (77.55 %), 55 non-state teachers (22.45 %). Considering their gender, 60 were male (24.5 %) and 185 female (75.5). The average age of state teachers was 41.60 and non-state 46.88. Of 241 expressed their marital status, 225 (93.4 %) were married and 16 (6.6) single. From the standpoint of academic level (Table 1-1), 35 teachers (41.3 %) had high school diploma, 103 (42) associate degree, 103 (42 %) bachelor degree and only four of them (1.6 %) had master degree. The major course of participants was elementary education (142) and non-elementary education (103). Their records of service were reported less than 5 years (22), 5-10 years (13), 10-15 years (411), 15-20 years (87) and above 20 years (82).

Regarding ADHD related educations, 191 (78) did not have any training in their academic years and only 54 (22 %) mentioned that they had passed just a brief course

about ADHD during their educational periods. About in-service training, 229 (93.5 %) teachers have not taken part in any educational courses, 13 ones participated in 1 to 2 workshops and only one of them claimed to have been in more than 6 workshops.

Teachers' awareness about etiology of ADHD: 129 (52.7%) of them did not believe it as a disorder; 110 (44.9%) announced that they did not have any knowledge about the cause of this disorder; only 31 (12.7%) mentioned that it may be nearly genetic and inheritance and the rest of the teachers believed in something wrong about the cause of ADHD.

Look on the six-points related to hyperactivity that are mentioned in DSM-IV, of 190 state teachers, 34 teachers did not pointed out to anything, 102 teachers to one item, 49 to two and just five of them to three items. of 55 non-state teachers, four teachers referred to no item, 20 to one, 30 to two and only one of them to three items. The average state teachers' knowledge was reported 1.13 and non-state teachers 1.51. The average female teachers' knowledge was reported 1.28 opposed to 1.03 for male teachers.

Viewpoint on the DSM-IV nine-points associated with Inattention, of 190 state teachers, 103 referred to none, 70 to one, 17 to two and none of them to more than two items. Of 55 non-state teachers, 33 referred to nothing, 17 teachers to one, five to two and none of them to more than two items. Of the nine points related to inattention, the mean of state teachers was 0.55 and non-state 0.49. Females' knowledge was reported 0.56 opposed to 0.45 for males'.

For three points of impulsivity, of 190 state teachers, 146 mentioned to none, 44 to one and none of them to more than one item. Among non-state teachers, 45 teachers referred to none and 10 to one item. Of the three points related to impulsivity, the mean of state teachers was 0.23 and non-state 0.18. In this case, both male and female teachers' knowledge was reported 0.22 of 3 points.

With regard to DSM-IV 18-point-criteria about ADHD, the reports of state teachers (Table 1-2) were 23 referred to none, 43-1, 67-2, 45-3, 9-4 and 3-5 items. The female teachers' knowledge was 1.98 while the males' was 1.66 point. About non-state teachers (Table 1-3), three referred to none, 6-1, 30-2, 11-3, 4-4 and only one teacher referred to five items. Female teachers' knowledge was 1.98 while male teachers 1.80. Generally, the mean score of state teachers was reported 1.91 while non-state teachers 2.18 point and totally it was reported 1.97. The average female teachers' knowledge was 2.05 while males' 1.70 point.

Table 1: Frequency of teachers in terms of the level of education

Level of education	Frequency	Percent
Master	4	1.6
Bachelor	103	42.0
Associate	103	42.0
Diploma	35	14.3
Total	245	100.0

Table 2: General awareness of state-teachers about "ADHD"

General awareness	Frequency	Percent
0 out of 18	23	12.10
1 out of 18	43	22.63
2 out of 18	67	35.26
3 out of 18	45	23.68
Out of 18	9	4.74
5 out of 18	3	1.58

Table 3: General awareness of non-state teachers about the sign of "ADHD"

General awareness	Frequency	Percent
0 out of 18	3	5.45
1 out of 18	6	10.90
2 out of 18	30	54.54
3 out of 18	11	20.00
Out of 18	4	7.27
5 out of 18	1	1.81

In accordance with DSM-IV 18-point checklist, both state teachers' knowledge (1.91) and non-state teachers' (2.18) were reported strongly weak. For inferential analysis of the data, first Kolmogorov-Smirnov test was conducted and after making sure about the normality of the data, parametric tests were used. Performing independent t test with a 95% confidence level, it was determined that there is no meaningful significance of knowledge between state and non-state teachers and also between male and female teachers. For comparing the teachers' knowledge in terms of the record of services, the Analysis of Variance (ANOVA) with the confidence of 95% showed that there was no meaningful difference, but ANOVA indicated teachers' knowledge at different academic levels was meaningfully different ($p \leq 0.05$). Based on *post hoc* test for ANOVA ($p \leq 0.05$), the highest knowledge was related to the highest educational levels.

DISCUSSION AND CONCLUSION

The results of this study have shown that teachers' awareness about the cause of ADHD and the main symptoms, based on DSM IV 18-point checklist, of this disorder is pretty weak in that 44.9% of them have not any knowledge about the etiology and their mean score about ADHD symptoms is 1.97 out of 18 points.

According to Das *et al.* (2011), ADHD is quite genetic related disorder while present study shows that nearly the half (44.9%) are not informed about the cause of this disorder and only 12.7% of them mention the cause

may be genetic. Our findings support the results of some of the earlier studies including Brook *et al.* (2000) and Shermon *et al.* (1997). The rest of teachers in our study believe in something wrong about the cause of ADHD that is congruent with the study of West *et al.* (2005), using the Knowledge about Attention Deficit Disorder Questionnaire (KADD-Q) on 256 teachers, in which they mentioned to some false beliefs about ADHD.

Considering DSM IV 18-point checklist, the mean knowledge of the teachers participated in the present study was 1.97 out of 18, which is strongly weak. This result is in line with the results of some researchers including Brook *et al.* (2000) reported that the teachers' knowledge about Attention Deficit Hyperactivity Disorder is low; Ghanizadeh *et al.* (2006) in a study conducted on 196 elementary school teachers reported that the teachers' knowledge in relation to Attention Deficit Hyperactivity Disorder is relatively low; Ramos (2008) indicated that teachers have problems with symptoms and signs of ADHD and their information is not enough in this field and Moldavsky *et al.* (2013) suggested a need for better teacher awareness about inattentive subtype of ADHD.

Regarding teaching experience, the findings of the present study show that the experience does not have significant effect on the level of teachers' knowledge, which are consistent with the results of earlier studies: Jerome *et al.* (1994) reported that both American and Canadian teachers did not have in-service training regarding ADHD; Bekle (2004) carried out an investigation among in-service teachers and students of teachers' training center. Based on this investigation both groups showed their interest to pass a comprehensive course associated with ADHD and Kos *et al.* (2004), highlighted that deficits in teachers' knowledge about ADHD are common for both in-service and preservice teachers. Anderson *et al.* (2012) reported differently: relative to pre-service teachers, in-service teachers show more overall knowledge of ADHD, more knowledge of characteristics and treatments for ADHD and higher perceived knowledge.

Perspective on the importance of teachers' knowledge, Liesveld (2007) reported the teachers who have the higher knowledge of ADHD possess general and positive beliefs towards children who are afflicted with this problem, they also have more confidence in their diagnosis, they are in support of multi-pattern approach for the treatment of this disorder and have more flexibility in applying different educational methods. Teachers with more information have more willingness to support the use of stimulants for the treatment of children afflicted with this disorder. Furthermore, Ohan *et al.* (2008) reported that the teachers with high and to some extent average, knowledge about ADHD reported more helpful

behaviors (e.g., help-seeking for their students) and Froelich *et al.* (2012) concluded that teacher training programs may be helpful in improving teachers' skills in addressing attentional and disruptive behavioural problems in the classroom.

In the end, the adequate knowledge related ADHD leading to aforementioned positive results may help the teachers to encounter these children the same as those suffering from hearing and vision defects, who are definitely needed to be helped in the class. Thus, it is recommended strongly upgrading the teachers' knowledge by holding some consistent in-service training programs to achieve its positive impacts on children and avoid of later complications of this disorder.

ACKNOWLEDGMENT

The writing of this article was funded by a grant from the Research and Technology Affair of Golestan University of Medical Sciences, Iran. The author wishes to thank all elementary teachers who willingly participated in this project.

REFERENCES

- Akram, G., A.H. Thomson, A.C. Boyter and M. McLarty, 2009. ADHD and the role of medication: Knowledge and perceptions of qualified and student teachers. *Eur. J. Special Needs Educ.*, 24: 423-436.
- American Academy of Pediatrics, 1992. Committee on children with disabilities: American association for pediatric ophthalmology and strabismus and American academy of ophthalmology: Learning disabilities, dyslexia and vision. *Pediatrics*, 90: 124-126.
- Anderson, D.L., S.E. Watt, W. Noble and D.C. Shanley, 2012. Knowledge of Attention Deficit Hyperactivity Disorder (ADHD) and attitudes toward teaching children with ADHD: The role of teaching experience. *Psychol. Schools*, 49: 511-525.
- Bahreini, A.M. and R. Macoo, 2000. The prevalence of attention deficit hyperactivity disorder in elementary school, Tehran. *Pazhoohandeh Res. Mag.*, 26: 555-558.
- Barkley, R., 2006. *Attention-Deficit Hyperactivity Disorder: A Clinical Workbook*. 3rd Edn., Guilford Press, New York, USA., ISBN-13: 9781593852276, Pages: 165.
- Bekle, B., 2004. Knowledge and attitudes about Attention-Deficit Hyperactivity Disorder (ADHD): A comparison between practicing teachers and undergraduate education students. *J. Attention Disorders*, 7: 151-161.

- Brook, U., N. Waternberg and D. Geva, 2000. Attitude and Knowledge of ADHD and Learning disability among high school teachers. *Patient Educ. Couns.*, 11: 247-252.
- Brown, R.T., W.S. Freeman, J.M. Perrin, M.T. Stein and R.W. Amler *et al.*, 2001. Prevalence and assessment of attention-deficit/hyperactivity disorder in primary care settings. *Pediatrics*, 107: 43-43.
- Das, M., A. Das Bhowmik, N. Bhaduri, K. Sarkar and P. Ghosh *et al.*, 2011. Role of gene-gene/gene-environment interaction in the etiology of eastern Indian ADHD probands. *Prog. Neuro-Psychopharmacol. Biol. Psychiatry*, 35: 577-587.
- Dulcan, M., 1997. Practice parameters for the assessment and treatment of children, adolescents and adults with attention-deficit/hyperactivity disorder. *J. Am. Acad. Child Adolescent Psychiatry*, 36: 85S-121S.
- Faraone, S.V. and J. Biederman, 1997. Do attention deficit hyperactivity disorder and major depression share familial risk factors? *J. Nervous Mental Dis.*, 185: 533-541.
- Froelich, J., D. Breuer, M. Doepfner and F. Amonn, 2012. Effects of a teacher training programme on symptoms of attention deficit hyperactivity disorder. *Int. J. Special Educ.*, 27: 76-87.
- Ghanizadeh, A., M.J. Bahredar and S.R. Moeini, 2006. Knowledge and attitudes towards attention deficit hyperactivity disorder among elementary school teachers. *Patient Educ. Counseling*, 63: 84-88.
- Golmirzaei, J., F. Moayedi and S.H. Zare, 2012. Prevalence of attention deficit/hyper activity disorder in preschool children of Bandar Abbas in 2010-2011. *Proceedings of the 5th International Congress of Child and Adolescent Psychiatry*, October 8-11, 2012, Tehran, pp: 9.
- Graetz, B.W., M.G. Sawyer and P. Baghurst, 2005. Gender differences among children with DSM-IV ADHD in Australia. *J. Am. Acad. Child Adolescent Psychiatry*, 44: 159-168.
- Jamali, S., E. Aghaei and A. Abed, 2012. The prevalence of ADHD in Iran: A meta-analysis study. *Proceedings of the 5th International Congress of Child and Adolescent Psychiatry*. October 8-11, 2012, Tehran, pp: 51.
- Jerome, L., M. Gordon and P. Hustler, 1994. A comparison of American and Canadian teachers knowledge and attitudes towards Attention Deficit Hyperactivity Disorder (ADHD). *Can. J. Psychiatry*, 39: 563-567.
- Kaplan, G. and J.H. Newcorn, 2011. Pharmacotherapy for child and adolescent attention-deficit hyperactivity disorder. *Pediatric Clin. North Am.*, 58: 99-120.
- Kos, J.M., A.L. Richdale and M.S. Jackson, 2004. Knowledge about attention-deficit/hyperactivity disorder: A comparison of in-service and preservice teachers. *Psychol. School*, 41: 517-526.
- Liesveld, J., 2007. Teachers knowledge, beliefs and values about children with ADHD. Ph.D. Thesis, The University of New Mexico, Albuquerque, NM., USA.
- Moldavsky, M., C. Groenewald, V. Owen and K. Sayal, 2013. Teachers recognition of children with ADHD: Role of subtype and gender. *Child Adolescent Mental Health*, 18: 18-23.
- Nass, R.D. and F. Leventhal, 2010. 100 Questions and Answers About Your Child's ADHD: From Preschool to College. 2nd Edn., Jones and Bartlett Learning, USA., ISBN: 9781449633301, Pages: 168.
- Ohan, J., N. Cormier, V. Hepp, A.W. Troy and M.C. Strain, 2008. Does knowledge about attention-deficit/hyperactivity disorder impact teachers reported behaviors and perceptions? *School Psychol. Q.*, 23: 436-449.
- Perold, M., C. Louw and S. Kleynhans, 2010. Primary school teachers knowledge and misperceptions of Attention Deficit Hyperactivity Disorder (ADHD). *South Afr. J. Educ.*, 30: 457-473.
- Ramos, N., 2008. Hispanic teachers' perceptions of children with ADHD. Ph.D. Thesis, Texas A and M University.
- Shermon, D.K., M.K. McGue and W.G. Iacono, 1997. Twin concordance for attention deficit hyperactivity disorder: A comparison of teachers and mothers reports. *Am. J. Psychol.*, 154: 532-535.
- Spencer, T.J., J. Biederman and E. Mick, 2007. Attention-deficit/hyperactivity disorder: Diagnosis, lifespan, comorbidities and neurobiology. *Ambulatory Pediatrics*, 7: 73-81.
- West, J., M. Taylor, S. Houghton and S. Hudyma, 2005. A comparison of teachers and parents knowledge and beliefs about Attention-Deficit/Hyperactivity Disorder (ADHD). *School Psychol. Int.*, 26: 192-208.
- Yoosefi, F. and M. Yoosefi, 1998. The prevalence of attention deficit hyperactivity disorder in elementary students, Sanandaj. *Kurdistan Univ. Med. Sci. Mag.*, 11: 13-17.