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# Knowledge, attitude, and behavior of elementary teachers regarding attention deficit hyperactivity disorder

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## Abstract:

**INTRODUCTION:** Attention deficit hyperactivity disorder (ADHD) is a common disorder in child psychiatry, which has a greater impact on the future life of the children affected in case of being untreated and undiagnosed. Given the undeniable role of teachers in improving this disorder and preventing its destructive consequences on children, the present research has examined the knowledge, attitude, and practice of elementary school teachers regarding ADHD.

**MATERIALS AND METHODS:** This was a descriptive, cross-sectional study carried out in 2019. One hundred and twenty teachers were randomly selected as samples among public and private schools in three districts of Isfahan. Data were collected by a self-administrated questionnaire including demographic variables, knowledge, attitude, and practice of teachers regarding ADHD and were analyzed by descriptive and analytical statistics. The Spearman's and Kendall' correlation coefficient, *t*-test, and Kolmogorov–Smirnov test were employed, and  $P < 0.50$  was considered statistically significant.

**RESULTS:** The findings indicated that 65% of teachers had favorable knowledge toward ADHD, 50% of them had a favorable attitude, and 56% of their practice was desirable. The questionnaire showed that only their knowledge about ADHD symptoms was desirable, but their knowledge about cause of the disorder and its treatment was not sufficient. There was an inverse relationship between the knowledge, attitude, and practice of teachers with age, and between education and having a child, a significant direct relationship was discovered. Teachers of public schools compared to private school teachers had significantly better knowledge, attitude, and practice.

**CONCLUSION:** Teachers' knowledge, attitude, and practice regarding ADHD was relatively high. However, it is necessary to educate teachers about etiology and methods of treatment of this disorder and behavior management of these students, especially private school teachers who need more education.

## Keywords:

Attention deficit hyperactivity disorder, attitude, elementary school, knowledge, practice, students, teachers

## Introduction

Attention deficit hyperactivity disorder (ADHD) is considered as one of the most common and chronic psychiatric disorders.<sup>[1,2]</sup> This disorder commonly begins in childhood, and mostly persists into adulthood.<sup>[3,4]</sup> and not only affects one's functioning in all aspects of life

but also affects family and community members.<sup>[5,6]</sup>

The Diagnostic and Statistical Manual of Mental Disorders-fifth edition (DSM-5) indicates that ADHD is characterized by persistent pattern of inattention, hyperactivity, and impulsivity and classified by severity (mild, moderate, and severe).<sup>[7]</sup>

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According to DSM-5, diagnosis of ADHD needs an individual to show 6/9 symptoms of either inattentiveness or hyperactivity and impulsivity in multiple settings (in at least two settings). The symptoms must last at least 6 months to confirm diagnosis and problems in the child's social and academic performance.<sup>[7,8]</sup>

The prevalence of the disorder is increasing worldwide.<sup>[6,9]</sup> It has been estimated to affect 5%–8% of school-aged children.<sup>[2,10]</sup> In Iran, nearly 10% of children suffer from ADHD.<sup>[11,12]</sup> Inheritance is the most common cause of ADHD, up to 2–3 times.<sup>[13,14]</sup> Boys are more likely to be diagnosed with ADHD than girls.<sup>[15,16]</sup> It is assessed that there is at least one child with ADHD features in every classroom.<sup>[3,17]</sup>

Due to the multiplicity and variety of problems they have in different domains of behavioral, social,<sup>[12]</sup> psychological, educational,<sup>[18]</sup> emotional, and cognitive,<sup>[19]</sup> different treatment approaches have been proposed.<sup>[18]</sup> The most effective one is comprehensive management which consists of multiple elements including stimulant medication, parental training, educational programs for children and their parents, and also behavioral modification techniques at school and home.<sup>[13,20]</sup>

One of the essential elements in the diagnosis, treatment, and management of schoolchildren with ADHD is schoolteachers.<sup>[14,16,21]</sup> At first, behaviors associated with ADHD are observed in the classroom setting and the teacher would be the first person to notice the signs and raise concerns about the child.<sup>[3,21,22]</sup>

As teachers interrelate with their students on a daily basis<sup>[12,16,22]</sup> and have a key role in identifying, referring, interacting, and also treating children with ADHD,<sup>[21,23]</sup> They should have a proper attitude towards these children, so that they can behave properly with them, so that they can behave properly with them.<sup>[1,9]</sup>

Studies have also presented that teachers' knowledge about ADHD is very low.<sup>[19]</sup> In addition to teachers' awareness, they do not have a right attitude toward child behavior<sup>[20]</sup> and, in fact, perceive child mistreatment to be a deliberate behavior or a child's revolt.<sup>[24]</sup> As a result, they banish the child or display antagonistic behavior that worsens the child's situation.<sup>[20]</sup>

In addition, according to Atkinson *et al.*, teachers' attitudes and behavior toward a student with ADHD may affect other students' perceptions of that child.<sup>[25]</sup>

On the other hand, the knowledge that teachers have about ADHD affects their attitudes<sup>[15,26]</sup> and behavior<sup>[3,20]</sup> toward affected children.

According to Soroa *et al.*, teachers who have false ideas and attitudes about ADHD tend to behave unsuitably in the classroom and teachers with more knowledge about ADHD have more favorable behavior and attitudes toward students with this disorder.<sup>[27]</sup>

Many studies around the world have discovered that teachers' knowledge is insufficient and needs intervention.<sup>[3,9,17]</sup> In general, studies in this field in Iran have shown a lack of desirable knowledge and attitudes.<sup>[28]</sup> For instance, Koosha *et al.* in Rasht,<sup>[29]</sup> Salamatbakhsh *et al.* in Tehran,<sup>[30]</sup> and Khademi *et al.* in Tabriz<sup>[12]</sup> have indicated in their study that teachers' knowledge and attitude toward ADHD in school-aged children is very low.

Given the increasing prevalence of ADHD, and the important role of teachers in dealing with hyperactivity children, and because of Lack of appropriate studies in this area, it seems necessary to measure teachers' knowledge, attitude, and performance about ADHD. The purpose of this study was to investigate the knowledge, attitude, and behavior of primary school teachers about ADHD in Isfahan.

## Materials and Methods

This cross-sectional study was conducted in 2019. The participants included the primary school teachers of three districts of Isfahan (public and private schools). The sample size was 126 teachers which obtained using previous studies and the lowest percentage of teachers' knowledge.<sup>[28]</sup> Isfahan Department of Education has six districts; one of them was selected by a random sampling method. The selected district consists of six public schools and five private schools. In the selected schools, after coordination with the authorities, during the break, all teachers who had met the inclusion criteria participated in the study and a structured questionnaire was administrated with informed consent. Inclusion criteria were to have at least 1 year of experience as a teacher in the primary school and willingness to participate in the study and the uncompleted questionnaires were excluded from the analysis. Six people completed the questionnaire partially who were excluded from the survey and the total number of 120 people entered the final analysis.

The questionnaire information was based on knowledge, attitude, and behavior of teachers in ADHD designed by Koosha *et al.*<sup>[29]</sup> and then demographic information form (age, sex, education, marriage status, and school type and having children) was gathered. The validity and reliability of the questionnaire was confirmed and the data were analyzed by SPSS version 20 software (SPSS Inc., Chicago, IL, USA). The Spearman's and Kendall's

correlation coefficient, *t*-test, and Kolmogorov–Smirnov test were employed, and  $P \leq 0.50$  was considered statistically significant.

To measure the knowledge, 12 questions with the options of “correct, false, and I don’t know” were asked. For instance, one of the questions was “Hyperactivity and lack of attention are caused by the wrong parenting” or “Hyperactivity and attention deficit disorder are inherited disorders”. “Correct” option had 2 scores, “false” had 0 score, and “I don’t know” had 1 score. In addition, the range of the scores was between 0 and 24. To determine the level of knowledge, the scores of 0–8 were considered poor knowledge, scores of 9–16 were considered medial, and scores of 17–24 were considered desirable. The classification was based on the mean and standard deviation. Thus, a standard deviation less than and above the mean was considered average, the lower value was considered weak, and the higher value was considered the optimal level.

For attitude, ten attitudinal questions with a rating based on a Likert scale with three options (agree, disagree, and I do not know) were asked. One of the questions was “In my opinion, the punitive and incentive rules for students with ADHD and other students need to be the equal.” Total scores were between 0 and 20, in which the scores of 0–7 were considered low attitude, scores of 8–14 were considered medial, and scores of 15–20 were considered desirable. (The classification was based on the mean and standard deviation. Thus, a standard deviation less than and above the mean was considered average, the lower value was considered weak, and the higher value was considered the optimal level).

To measure behavior, six questions were asked. Functional questions had three options, one in which the teacher’s behavior in that condition was described and in another option the teacher’s misconduct was described and the third option was “I hadn’t even noticed.” One of the questions was “what would you do if an ADHD student constantly moves and distracts other?” The correct response had 2 scores, the wrong response was 0, and “never noticed” response had 1 score. In addition, the range of the scores was between 0 and 12. The scores between 0 and 4 were considered low behavior, scores of 5–8 were considered medial, and scores of 9–12 were considered desirable. (The classification was based on the mean and standard deviation. Thus, a standard deviation less than and above the mean was considered average, the lower value was considered weak, and the higher value was considered the optimal level).

The teachers’ participation in the study was completely voluntary and they were assured that they would

not need to write their names and the data would be analyzed in a confidential and collective manner.

## Results

Of 126 questionnaires filled by teachers, 114 (95%) participants entered the analysis and 6 were excluded from the study due to incompleteness. One hundred and eighteen (98.3%) teachers were female, 71.7% of them were working at public schools. Only 2.5% of teachers were single and about 87.5% of them had children. The mean and standard deviation of the age was  $44.1 \pm 8.47$ . About 8.3% of the teachers had diploma, 14.2% had associate, 60% had bachelor’s degree, and 17.5% of teachers had higher degree. More than half of the teachers had gained ADHD information during the course of training.

The absolute and relative distribution of the average number of knowledge, attitude, and behavior of teachers is given in Table 1. Sixty-five percent of them had the eligible knowledge. The mean and standard deviation of the teacher’s knowledge score was  $4.11 \pm 18.87$  (out of 24). 59.2% of teachers had the desired attitude, and the total average score of their attitude was  $4.14 \pm 14.9$  (out of 20). In addition, 55.8% of the teachers had good behavior and the mean was  $3.13 \pm 8.7$  (out of 12).

Comparing the mean value of knowledge, attitude, and behavior of teachers in terms of having or not having children showed that teachers with children gained higher behavior scores ( $P < 0.05$ ). Results from Table 2 show that the mean value of the attitude, knowledge, and

**Table 1: Total and relative distribution of mean of knowledge, attitude, and behavior**

	Low, n (%)	Average, n (%)	High, n (%)
Knowledge	0	42 (35)	78 (65)
Attitude	1 (0.8)	60 (50)	59 (49.2)
Behavior	12 (10)	41 (34.2)	67 (55.8)

**Table 2: Comparison of the mean value of the teacher’s attitude, knowledge, and behavior sorted by education level and school type**

Variable	Mean±SD		
	Knowledge	Attitude	Behavior
Education			
Diploma	13.60±2.59	11.50±2.46	4.90±1.85
Associate’s degree	16.64±2.93	11.82±2.85	7.17±2.67
Bachelor’s degree	19.72±3.88	15.56±4.04	9.29±2.91
Master’s degree	20.28±3.82	17.23±3.70	10.19±2.87
Analysis of variance ( <i>P</i> )	<0.001	<0.001	<0.001
School type			
Public schools	20.50±3.56	16.12±3.93	9.59±2.85
Private schools	14.76±2.03	12.11±3.19	6.73±2.89
The result of the <i>t</i> -test ( <i>P</i> )	<0.001	<0.001	<0.001

SD=Standard deviation

behavior is compared to the degree of education level and it shows that higher education teachers performed better. Furthermore, the mean value of attitude, knowledge, and behavior of teachers is compared due to school type ( $P < 0.001$ ). That is, teachers in public schools had a better knowledge of private school teachers. The mean value for public schools was 20.50 and for private schools was 14.76. The attitude and behavior were also lower in private schools ( $P < 0.001$ ).

To determine the relation between the mean of attitude, knowledge, and behavior of teachers regarding ADHD and age, we used Pearson's correlation test. The results showed that there is an inverse relation between age and their mean value (knowledge -  $r = 0.2$  and  $P = 0.023$ ; attitude -  $r = 0.21$  and  $P = 0.019$ ). The relation between the attitude, knowledge, and behavior of teachers is presented in Table 3.

### Discussion

The results showed that the level of knowledge of most teachers about ADHD was desirable. On the contrary, in most previous studies, teachers' knowledge about ADHD has been reported inadequate. Yoo *et al.* in Korea (2009),<sup>[31]</sup> Jimoh in Nigeria (2014),<sup>[32]</sup> Blotnick-Gallant in Canada (2015),<sup>[33]</sup> Al-Omari *et al.*,<sup>[16]</sup> Ghanizadeh *et al.* in Iran,<sup>[28]</sup> and Amiri *et al.* in Iran (2016)<sup>[22]</sup> all agreed with low knowledge's results.

About half of the teachers had acquired information from the training courses and 31.7% of them from friends or colleagues, which is similar to Koosha's *et al.* findings in Rasht.<sup>[29]</sup>

Contrary to the finding in Ghanizadeh's study, only a small percentage of the teachers acquired their information during their education.<sup>[28]</sup> It appears that the information provided in the training courses may have higher validity comparing to other sources. Although the main source of information on the training courses is reported on-the-job, knowledge of the teachers in different districts is not the same<sup>[12,22,29]</sup> and it seems that cultural factors, time, and difference in sources of information regarding ADHD may affect the provision of information in training courses. The mean value of knowledge in this study has increased comparing to previous studies. In Ghanizadeh's

study, the mean value of knowledge was maximum 50%, in Kousha's more than 60%, and in the present study, it was 65%. Although most of the teachers had acquired moderate and high knowledge scores, the questionnaire showed that only their knowledge about the symptoms of ADHD was adequate and had an average knowledge about cause of the disorder and the methods of treatment.

Some of teachers believed that the wrong way of treating children by parents is the cause of ADHD. Similar to these findings, for example, Rodrigo *et al.*<sup>[34]</sup> and Ghanizadeh *et al.*,<sup>[28]</sup> most of the teachers blamed the wrong way of behaving children or subordination.

As the previous studies show, less than half of the teachers considered the ADHD hereditary, which indicates the average knowledge of teachers about the etiology of the disease that would lead to develop a need for information in this regard.

Regarding the importance of drug consumption in children with ADHD, the majority of teachers responded correctly to this question which was similar in previous studies,<sup>[22,30]</sup> but in contrary with the findings of Ghanizadeh *et al.* in Shiraz<sup>[28]</sup> and Alkahtani in Bahrain.<sup>[35]</sup>

About half of the teachers had an ideal attitude toward students with ADHD, which was in contrary with previous studies reporting low attitude toward this issue.<sup>[16,22,28,32]</sup> Analyzing question-by-question attitude showed that many teachers disagreed with the flexibility of class rules for students ADHD as Koosha *et al.* also reported.

In the present study, most of the teachers agreed with punitive laws for these students, which was in parallel with previous studies.<sup>[36]</sup> Concerning the negative consequences of punishment, information in this regard needs to be given to the teachers.

Most of the studies on ADHD confined to analyze the knowledge and attitude of teachers and had less attention to their behavior. In this study, behavior evaluation was determined that more than half of the teachers had achieved high scores which was similar to Koosha *et al.*<sup>[29]</sup> and Nighat's<sup>[34]</sup> findings.

Teachers' good behavior with an average attitude could be due to the influence of some factors such as low number of behavior questions comparing to knowledge and attitude questions and due to their tendency to respond conservatively to behavior questions. The reason is that in the present study, behavior has been measured in the way of self-reporting evaluation, which is better to evaluate with the observation in order to achieving accurate results.

**Table 3: The relationship between knowledge, attitude, and behavior among teachers**

	Pearson's correlation	Significant (two-tail), P
Knowledge - attitude	0.67	<0.001
Knowledge - behavior	0.60	<0.001
Behavior - attitude	0.71	<0.001



The results indicated a correlation between behavior, knowledge, and attitude. The correlation coefficient between behavior and attitude was stronger than correlation coefficient between behavior and knowledge. This means that teachers' behavior influenced more by their attitude rather than knowledge and knowledge alone is not enough for desirable behavior.

There was a significant inverse relation between the means of knowledge, attitude, and behavior of teachers and their age, as the younger teachers gained higher mean scores. One of the possible reasons could be higher education of younger teachers and greater attendance at in-service training. Contrary to this finding in the previous studies, there was no significant relationship between the score of knowledge, attitude, and practice with teachers' age.<sup>[30,32]</sup>

Furthermore, there was a significant relation between the means of knowledge, attitude, and behavior of teachers and school type, so that the participants teaching in public schools had better knowledge, attitude, and behavior compared to those teaching in private schools. The possible reason may be that based on the legal requirements in public school, teachers must participate in training courses more than teachers in private schools. Contrary to this finding, Badleh<sup>[37]</sup> did not discover a statistically significant correlation between the means of knowledge, attitude, and behavior and the school type.

It should be noted that in this study, the data were gathered only by self-report measurements. For more accurate results, it is advisable to evaluate teachers' performance information by observation.

## Conclusion

In general, the findings of this study indicated that the attitude, knowledge, and behavior of elementary school teachers in Isfahan regarding the ADHD disorder were relatively desirable. Teachers can use the results to understand the etiology and ways of treating this disorder and managing the behavior of affected students and interact appropriately with them. In particular, public school teachers need more education.

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## Conflicts of interest

There are no conflicts of interest.

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