

# KNOWLEDGE AND MISPERCEPTIONS TOWARDS DIAGNOSIS AND MANAGEMENT OF ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD) AMONG PRIMARY SCHOOL AND KINDERGARTEN FEMALE TEACHERS IN AL-RUSAIFAH DISTRICT, MAKKAH CITY, SAUDI ARABIA

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## ABSTRACT

**Background:** Attention deficit hyperactivity disorder (ADHD) is a disorder of childhood and adolescence and it is one of the most common psychiatric disorders that cause distress in the lives of both children and adult. If ADHD remains undetected the child may experience academic failure, rejection by peers, and develop low-self-esteem. Teachers are seen as one of the most valuable sources of information with regard to referral and diagnosis of ADHD. They also have the responsibility for creating an environment conducive to academic, social and emotional success for children with ADHD.

**Aims & Objective:** To assess the knowledge of primary school and kindergarten female teachers in Al-Rusaifah district, Makkah city, towards the diagnosis and the management of ADHD as well as factors associated with ADHD knowledge among them.

**Materials and Methods:** A cross sectional study among primary school and kindergarten female teachers working in Al-Rusaifah district, Makkah, Saudi Arabia, 2011. An interview questionnaire for diagnosis and management of ADHD in children was implemented. The questionnaire was designed in Arabic language. It consists of 38 questions covering 3 parts; regarding socio demographic features, general knowledge of ADHD with its coexisting conditions, and management of ADHD utilizing a questionnaire based on the Diagnostic and Statistical Manual of Mental Disorders (4th Ed) (DSM-IVR) diagnostic criteria.

**Results:** The study included 130 teachers with a response rate of 100%. Their age ranged between 22 and 58 years with a mean of 33.32 ± 7.77 years. More than half of the participants (72; 55.4%), responded that they had insufficient information regarding ADHD during their undergraduate stage. The majority (114; 87.7%) did not attend any conference regarding ADHD while (78; 60%) reported history of reading about ADHD. Relatively highest level of knowledge was observed for the items dealing with symptoms and facts related to diagnosis of ADHD (71.75%) while the lowest level of knowledge was revealed for the items reflecting general knowledge about ADHD (37%). The overall mean percentage of correct answers was 58.9%. The mean percentage of score reflecting knowledge of the teachers about diagnosis of ADHD was significantly higher among teachers aged 25 years or below as compared to older teachers. The majority of teachers (84.6%) agreed that they have an active role in the management of ADHD and that teachers should play an active role in ADHD management if combined with drugs (83.8%).

**Conclusion:** In conclusion, an inadequacy of knowledge regarding ADHD among a sample of female teachers in Al-Rusaifah district, Makkah, was observed. This inadequacy of knowledge raises serious questions about the screening of ADHD at the level of schools in Makkah.

**Key Words:** Attention Deficit Hyperactivity Disorder (ADHD); Knowledge; Misperceptions; Saudi Arabia

## Introduction

The early childhood period is one of the most important stages of a person's life. In which the personality is performed. The personality is established as an interaction to the surrounding environment.<sup>[1]</sup> One of the most important mental processes is attention. It plays an effective role in the intellectual growth to a child. As it helps him to get the positive and desired behaviour, which harmonize the child with his surrounding environment.<sup>[1]</sup>

Although the attention is a growing mental process; the preschool child could suffer from attention deficit associated with hyper activity. This leads him to have an inappropriate behaviour, such as being distracted and unable to finish his task, hyper active and moves non-

purposefully and impulsive. Most of the time, the parents do not give much attention to these behaviours, until the child goes to the kindergarten; the troubles begin.<sup>[1]</sup>

Attention deficit hyperactivity disorder (ADHD) is one of the most common disorders among children.<sup>[2,3]</sup> And it has great impact on the family unit start from children till adult life needs considerable research effort. Its adverse effect including academic and occupational underachievement, learning difficulties, substance use, poor peer and family relationship and psychiatric disorders<sup>[4]</sup>, raises the need to study this issue.

Naturally the children differ in their behaviours, but the child could go beyond the normal behaviour. This can lead him to be unsuccessful in his future academic and social

life. All these difficulties represent a burden on the parents at home and the caregiver at the day-care or kindergarten. This can lead to problems in learning and in relations with his peers. These behaviours are considered inappropriate and the child could get punished for it, which makes him feel to be rejected.<sup>[1]</sup>

There are no available studies to show knowledge of Primary school and kindergarten teachers about ADHD in Saudi Arabia. Therefore, we conducted this study aiming to evaluate the knowledge of female teachers about attention deficit hyperactivity disorder, Al-Rusaifah district, Makkah AL-Mukarramah over a period of 6 months.

## Materials and Methods

This is a cross sectional study included primary school and kindergarten female teachers working in governmental and private kindergarten and primary school in Al-Rusaifah district, Makkah, Saudi Arabia, who are present at the time of conducting the study (2011-2012). In Al-Rusaifah district, there are 11 female primary schools (7 governmental schools and 4 private schools) and there are 6 kindergarten (two governmental and 4 private kindergarten). Non-Arabic speaker teachers were excluded from the study. The total number of the female teachers in the kindergartens and primary schools in Al-Rusaifah district was 198 teachers.

Assuming that, from the literature review of the same subject, the knowledge of teachers about ADHD as average as 42.6%.<sup>[5]</sup> Setting the confidence interval of 95% and sample error of 5%, using the Raosoft sample size calculator program, the sample size calculation was 130 teachers.<sup>[6]</sup> They were selected by using a numbered list of teachers name in all schools through online random number generator software.<sup>[7]</sup>

An interview Arabic questionnaire was carefully designed by the researcher to serve the purpose of this study. Questionnaires of few similar studies were reviewed before finalizing the study questionnaire. It was validated by three consultants under their experience in fields of family medicine, psychiatry and psychology. It consists of 38 questions covering 3 parts; regarding socio demographic features, general knowledge of ADHD with its coexisting conditions, and management of ADHD utilizing a questionnaire based on the Diagnostic and Statistical Manual of Mental Disorders (4th Ed) (DSM-IVR) diagnostic criteria.<sup>[8]</sup> The answers included five-level Likert item: 1 – strongly disagree; 2 – disagree; 3 – do not know; 4 – agree; 5 – strongly agree. One question inquired how teacher rate their knowledge toward ADHD (poor, moderate, excellent).

The data was collected by interviewing primary school and kindergarten female teachers in their schools by the researcher herself who interviewed all the teachers and filled a pre-designed questionnaire at regular day working hours during the break and free class time according to each teacher in teachers' room over a period of one month. Each questionnaire took 15 to 20 minutes to be completed. One to three days were spend in each school of the total 18 schools in the catchment area of Al-Rusaifah PHC (according to the numbers of teachers in each school).

A pilot study was conducted in "Al-angal" private kindergarten and a primary school for girls in holy Makkah, and they were excluded from the proper study. There were 24 teachers in the pilot, which represent 18% of the sample size. Nine teachers from kindergarten and fifteen from primary school. Therefore, questionnaire and methodology were tested and necessary modifications were made accordingly.

Written permissions from Joint Program of Family and Community Medicine (JPFCM) and Ministry of education were obtained before conducting the research. Permissions of all primary school and kindergarten directors and teachers were obtained. The researcher tried her best not to disturb the primary schools and kindergarten; she visited all the schools after arranging with the schools directors. The individual consent from every teacher participated in the study was a prerequisite for data collection. It was written on front page of questionnaire that (Answering questionnaire means agreement of participation in the study) and each teacher was reminded before she answers the questions. All information were kept confidential and will not be accessed except for the purpose of the scientific research. The researcher submitted recommendations out of this study to the higher authorities.

## Statistical Analysis

The data were verified by hand then coded and entered to a personal computer. Data entry and analysis were performed Using SPSS software statistical program version 16. Significance was determined at p value < 0.05. Continuous variables were presented as means and standard deviation while categorical variables were presented as frequencies and percentages. Bivariate analysis of mean percentage of knowledge subscale scores with regard to independent variables was done by unpaired t test and one-way analysis of variance (ANOVA) statistical tests. Least significance difference test (LSD) test was used for post hoc comparisons of ANOVA. We

considered percentage of true answer cut of point 60%. Teachers' knowledge was categorized according to the mean knowledge score into four categories; insufficient (mean score ≤ 60%); good (mean score 61-75%); very good (mean score 76-85%); and excellent (mean score >85%). Score was calculated as number of true answer / number of responder \* 100.

## Results

The study included 130 teachers their age ranged between 22 and 58 years with a mean of 33.32 ±7.77 years. Table 1 showed that slightly more than half of the teachers; 67 (51.5%) aged between 26 and 35 years and 42 (32.3%) were over 35 years. Slightly less than half of them 60 (46.2%) had experience for < 5 years. It was found that the majority; 124 (95.4%) were Saudi and 112 (86.2%) were university graduated. Almost one quarter; 30 (23.1%) were specialized in kindergarten.

More than half of the participants (72; 55.4%), responded that they had insufficient information regarding ADHD during their undergraduate stage. The majority (114; 87.7%) did not attend any conference regarding ADHD while (78; 60%) reported history of reading about ADHD. Among those who had read about ADHD, 42.3% had their information from the internet while 35.9% and 24.2% had their information from television and study curriculum respectively.

### Knowledge of the teachers about ADHD

Figure 1 illustrates that 60.8% of the participants had an excellent knowledge regarding diagnosis of ADHD while only 2.3% had insufficient knowledge. Almost fourteen percent of the participants had insufficient knowledge regarding general information about ADHD (13.8%) and more than half of teachers (57.7%) had good knowledge. Figure 1 also illustrates that only 13.1% of the participants had excellent knowledge regarding treatment of ADHD while 6.2% had insufficient knowledge. It is obvious that more than one-third of the respondents (37.7%) showed excellent overall ADHD knowledge and only 0.8% had insufficient knowledge.

Figure 2 illustrates that the relatively highest level of knowledge was observed for the items dealing with symptoms and facts related to diagnosis of ADHD (71.75%) while the lowest level of knowledge was revealed for the items reflecting general knowledge about ADHD (37%). The overall mean percentage of corrected answers was 58.9%.

**Table-1: Demographic characteristics of the study group (n=130)**

Characteristics	No.	%	
Age in years	≤ 25	21	16.2
	26-35	67	51.5
	>35	42	32.3
Years of experience	<5	60	46.2
	05-Oct	25	19.2
	>10	45	34.6
Nationality	Saudi	124	95.4
	Non Saudi	6	4.6
Qualification	University	112	86.2
	Diploma	16	12.3
	Master	2	1.5
Specialty	Kindergarten	30	23.1
	Arabic	31	23.8
	Religious	21	16.2
	Social	14	10.8
	Mathematic	11	8.5
	Others	23	17.7

**Table-2: Mean percentage of score reflecting knowledge of the teachers about diagnosis of ADHD according to their demographic characteristics**

Characteristics	Mean %	SD %	P	
Age in years	≤ 25 (21)	94	11.2	0.008*
	26-35 (67)	85.4	11.3	
	>35 (42)	85.4	11.4	
Years of Experience	<5 (60)	88.2	12.1	0.419*
	5-10 (25)	86.7	12.9	
	>10 (45)	85.1	10.2	
Nationality	Saudi (124)	86.9	11.7	0.643**
	Non Saudi (6)	84.6	11.4	
Qualification	Diploma (16)	87.8	8.5	0.887**
	University+ (114)	86.8	12.1	
	Kindergarten (30)	88.8	15.9	
Specialty	Arabic (31)	85.3	11.9	0.626*
	Religious (21)	87.4	10.1	
	Social (14)	89.5	7.4	
	Mathematics (11)	86.8	7.3	
	Others (23)	84.1	9.9	

\* ANOVA test; \*\* Student' t-test

**Table-3: Mean percentage of score reflecting knowledge of the teachers about general information regarding ADHD according to their demographic characteristics**

Characteristics	Mean %	SD %	P	
Age in years	≤ 25 (21)	71.1	6	0.941*
	26-35 (67)	70.2	11	
	>35 (42)	70.6	10.5	
Years of experience	<5 (60)	71.1	9.9	0.503*
	5-10 (25)	71.7	13.9	
	>10 (45)	69.1	7.9	
Nationality	Saudi (124)	70.3	10.2	0.441**
	Non Saudi (6)	73.9	10.2	
Qualification	Diploma (16)	67.5	8.2	0.144**
	University+ (114)	70.9	10.4	
	Kindergarten (30)	72.1	13.1	
Specialty	Arabic (31)	68.7	10.1	0.860*
	Religious (21)	71	6.9	
	Social (14)	70	9.5	
	Mathematics (11)	69.7	9.2	
	Others (23)	71.2	9.6	

\* ANOVA test; \*\* Student' t-test

### Factors affecting ADHD knowledge

#### Demographic factors

As shown in table 2, the mean percentage of score reflecting knowledge of the teachers about diagnosis of

ADHD was significantly higher among teachers aged 25 years or below as compared to older teachers (p=0.008). There was no statistically significant difference in the mean percentage of score reflecting knowledge of the teachers about diagnosis of ADHD with years of experience, nationality, qualification and specialty.

**Table-4: Mean percentage of score reflecting knowledge of the teachers about treatment of ADHD according to their demographic characteristics**

Characteristics	Mean %	SD %	P
Age in years	≤ 25 (21)	72	8.9
	26-35 (67)	76.5	16.5
	>35 (42)	73.8	12.4
Years of experience	<5 (60)	75.6	16.9
	5-10 (25)	75.8	9.6
	>10 (45)	73.6	12.6
Nationality	Saudi (124)	75	14.3
	Non Saudi (6)	73.1	15.5
Qualification	Diploma (16)	71.2	9.6
	University+ (114)	75.4	14.8
	Kindergarten (30)	76.3	11.4
Specialty	Arabic (31)	74.7	9.8
	Religious (21)	73	11.8
	Social (14)	71.8	16.1
	Mathematics (11)	75.8	10.9
	Others (23)	76.6	23.3

\* ANOVA test; \*\* Student' t-test

**Table-5: Mean percentage of score reflecting ADHD overall knowledge of the teachers according to their demographic characteristics**

Characteristics	Mean %	SD %	P
Age in years	≤ 25 (21)	86.1	6.3
	26-35 (67)	82	9.1
	>35 (42)	81.8	8.2
Years of experience	<5 (60)	83.5	8.7
	5-10 (25)	83	10.8
	>10 (45)	81.1	6.6
Nationality	Saudi (124)	82.6	8.5
	Non Saudi (6)	82	10
Qualification	Diploma (16)	82.8	5.4
	University+ (114)	81.3	8.9
	Kindergarten (30)	84.4	12.6
Specialty	Arabic (31)	81.3	7.5
	Religious (21)	82.8	7.1
	Social (14)	83.3	7
	Mathematics (11)	82.5	4.8
	Others (23)	81.4	6.8

\* ANOVA test; \*\* Student' t-test

**Table-6: Mean percentage of score reflecting knowledge of the teachers about diagnosis of ADHD according to previous training and self-rating of level of knowledge**

Characteristics	Mean %	SD %	P
Think having enough undergraduate information about ADHD	No (29)	82.7	9
	Yes (29)	89.1	10.6
	Not enough (72)	87.5	12.7
Attended any courses related to ADHD	Yes (16)	86.9	14.4
	No (114)	86.7	11.3
Read about ADHD	Yes (78)	87.6	11.6
	No (52)	85.7	11.8
Evaluation of ADHD case	Yes (28)	83.7	13.1
	No (102)	87.7	11.1

\* ANOVA test; \*\* Student' t-test

Table 3 shows that there was no statistically significant difference in the mean percentage of score reflecting knowledge of the teachers about general information

regarding ADHD with any of the studied demographic characteristics. Similarly, table 4 demonstrates that there was no statistically significant difference in the mean percentage of score reflecting knowledge of the teachers about treatment of ADHD with any of the studied demographic characteristics and table 5 shows that there was no statistically significant difference in the mean percentage of score reflecting overall knowledge of the teachers about ADHD with any of the studied demographic characteristics

**Table-7: Mean percentage of score reflecting knowledge of the teachers about general information regarding ADHD according to previous training and self-rating of level of knowledge**

Characteristics	Mean %	SD %	P
Think having enough undergraduate information about ADHD	No (29)	66.8	8.5
	Yes (29)	73.7	13.9
	Not enough (72)	70.7	8.5
Attended any courses related to ADHD	Yes (16)	75.4	13.1
	No (114)	69.6	9.3
Read about ADHD	Yes (78)	72.2	10.4
	No (52)	67.9	9.3
Evaluation of ADHD case	Yes (28)	67.6	11.1
	No (102)	71.3	9.8

\* ANOVA test; \*\* Student' t-test

**Table-8: Mean percentage of score reflecting knowledge of the teachers about treatment of ADHD according to previous training and self-rating of level of knowledge**

Characteristics	Mean %	SD %	P
Think having enough undergraduate information about ADHD	No (29)	75.9	21.6
	Yes (29)	76.2	14.5
	Not enough (72)	74	10
Attended any courses related to ADHD	Yes (16)	76.4	11.7
	No (114)	74.5	14.5
Read about ADHD	Yes (78)	77	16.4
	No (52)	71.8	9.5
Evaluation of ADHD case	Yes (28)	75.4	9.6
	No (102)	74.8	15.3

\* ANOVA test; \*\* Student' t-test

**Table-9: Mean percentage of score reflecting ADHD overall knowledge of the teachers according to previous training and self-rating of level of knowledge**

Characteristics	Mean %	SD %	P
Think having enough undergraduate information about ADHD	No (29)	79.3	6.1
	Yes (29)	85.1	9.8
	Not enough (72)	82.9	8.5
Attended any courses related to ADHD	Yes (16)	84.3	11.8
	No (114)	82.2	7.9
Read about ADHD	Yes (78)	83.9	8.8
	No (52)	80.7	7.7
Evaluation of ADHD case	Yes (28)	80	9.9
	No (102)	83.3	8

\* ANOVA test; \*\* Student' t-test

**Table-10: Attitude of the teachers towards Management of ADHD**

Items reflecting attitude	Disagree	Agree
Teachers have an active role in management	20 (15.4%)	110 (84.6%)
Teachers will play an active role in ADHD management if combined with drugs	21 (16.2%)	109 (83.8%)

Previous training

As shown in table 6, the mean percentage of score

reflecting knowledge of the teachers about diagnosis of ADHD was not significantly different with having undergraduate information, attending conference on ADHD, reading about it or evaluating a case of ADHD. Table 7 shows that the mean percentage of score reflecting knowledge of the teachers about general information regarding ADHD was significantly higher among teachers who had sufficient undergraduate information than those without such information or without enough information. Those who read about ADHD had higher significant mean percentage of score reflecting knowledge of the teachers about general information regarding ADHD compared to those who did not read about ADHD. In addition, table 10 demonstrates that there was no statistically significant difference in the mean percentage of score reflecting knowledge of the teachers about general information regarding ADHD with history of attending conference on ADHD, or evaluating a case of ADHD.

teachers about treatment of ADHD with undergraduate training, attending a conference about ADHD or history of evaluating a case of ADHD.

It is obvious from table 9 that the mean percentage of score reflecting overall knowledge of the teachers about ADHD was significantly higher among teachers who had sufficient undergraduate information than those without such information or without enough information. Those who read about ADHD had higher significant mean percentage of score reflecting overall knowledge of the teachers about ADHD compared to those who did not read about ADHD. In addition, table (10) demonstrates that there was no statistically significant difference in the mean percentage of score reflecting overall knowledge of the teachers about ADHD with history of attending conference on ADHD, or evaluating a case of ADHD.

**Attitude of the teachers towards their role in management of ADHD**

Table 10 displays response of the teachers to the items reflecting their attitude towards management of ADHD. It shows that the majority of them (84.6%) agreed that teachers have an active role in the management of ADHD and that teachers will play an active role in ADHD management if combined with drugs (83.8%).

**Discussion**

The value of study came in consequence with what was found in literature which reported that after anxiety and depression, ADHD is the third most common reason for application to the outpatient clinic.<sup>[5]</sup> Moreover, in two studies conducted in Saudi Arabia to elaborate prevalence of ADHD among primary school students revealed that the prevalence ranged between 12.6% in Riyadh, and 16.4% in Dammam<sup>[9,10]</sup>, which indicate that it is not uncommon disorder in our community. Besides, and putting into consideration that early identification of co-morbid disorders associated with ADHD can contribute to more accurate diagnosis and foster optimal treatment and perhaps better diagnosis.<sup>[14]</sup> In order to achieve this, there must be knowledgeable teachers capable to identify these disorders among their student.<sup>[4]</sup> To ensure their capabilities in achieving this purpose, the current study aimed at assessing knowledge of teachers towards diagnosing and management of ADHD.

The additional importance of the current study is based on, to the best knowledge of the researcher, it is unprecedented study assessing knowledge of teachers to diagnosis and management of ADHD.

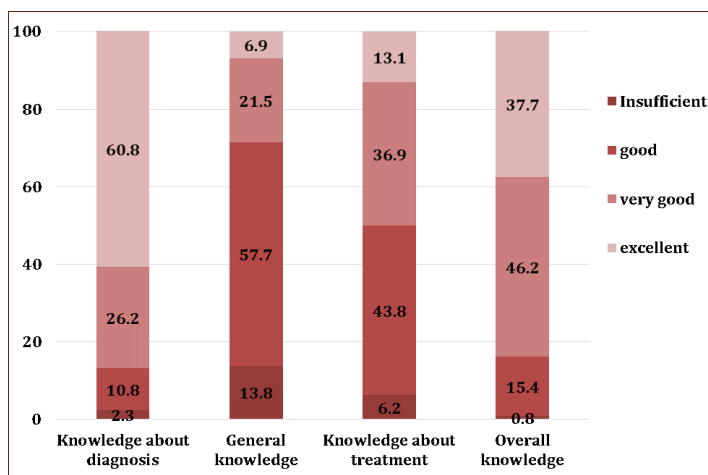


Figure-1: Level of ADHD knowledge among teachers

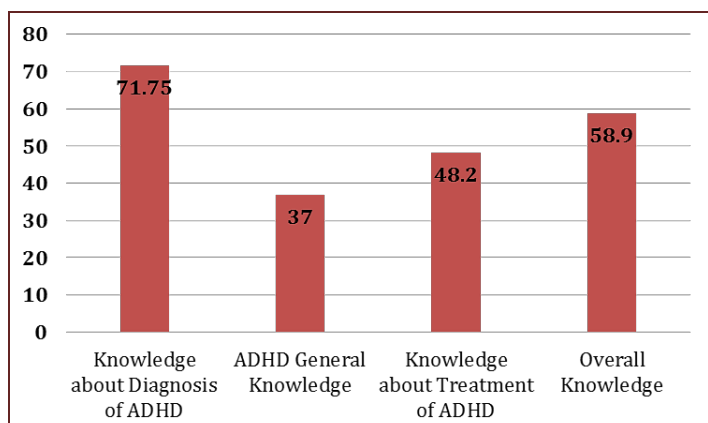


Figure-2: Summary for the percentages of right answers about different items of ADHD and overall mean percentage

Table 8 shows that the mean percentage of score reflecting knowledge of the teachers about treatment of ADHD was significantly higher among teachers who read about ADHD. There was no statistically significant difference in the mean percentage of score reflecting knowledge of the

The study included 130 teachers with a response rate of 100%. This high response rate can probably be ascribed to the researcher herself filling in all checklists and personal contact with the schools directors as well as to the explanation of the purpose of the study, scientific importance and value of the study to each teacher. According to Rosnow and Rosenthal (1999)<sup>[12]</sup> these techniques (e.g. personal contact, using reminders and explaining the scientific importance and value of the study, ensuring the participants confidentiality) are linked to increase participation in surveys.

Teachers knowledge was categorized according to the mean knowledge score into four categories; insufficient (mean score  $\leq$  60%), good (mean score 61-75%), very good (mean score 76-85%) and excellent (mean score  $>$ 85%). The teachers who responded to this survey had less knowledge about ADHD than one would expect considering their pivotal role in the recognition and treatment of ADHD. In the present study, teachers' overall percentage score of correct answers was 58.9%, indicating insufficient ADHD knowledge. These results are higher than those reported by Kleynhans, 2005<sup>[13]</sup> who reported an average of 42.6% for correct answers among a sample of teachers in South Africa and those reported by Scituito et al, 2000<sup>[14]</sup> who reported an average of 47.8% for correct answers for their sample of American teachers. Our figure is somewhat lower than the results of Kos et al, 2004<sup>[15]</sup> who reported that 60.7% of the items on the knowledge questionnaire were correctly answered by teachers in Australia. These differences could be attributed to different tools have been used for data collection in various studies.

In accordance with Kleynhans<sup>[13]</sup>, teachers in this study were most knowledgeable about the items on the symptoms/diagnosis subscale, with more than 70% of the teachers correctly identifying the symptoms of distractibility, fidgeting, difficulties with organization, as well as of the primary clusters of ADHD symptoms. Although the data suggest that teachers were able to recognize the symptoms of ADHD, the data also showed that slightly less than 50% of the respondents did not know that the child's symptoms must have been present before age 7 and slightly more than 50% of them believed incorrectly that symptoms should not appear in the whole life fields at least 6 months. These responses by the teachers proved lack of knowledge about diagnosis.

Scores on the items on general knowledge subscale that contained information about the nature and course of ADHD, and the treatment subscale which contained information on interventions were lower than on

symptoms/symptoms subscale. According to Barkley,<sup>[16]</sup> it will be difficult to establish behaviour management programs within classroom if teachers have a poor grasp on the nature, outcome and treatment of ADHD. These results suggest that future educational interventions should focus not just on symptoms/symptoms, but also on other characteristics of ADHD.<sup>[17]</sup>

The findings of the current survey were in agreement with the outcomes of multiple studies which have demonstrated that teachers lack the knowledge of treatment alternatives for working with children with ADHD.<sup>[11,14-16,18,19]</sup> Similar to other studies, the findings here suggest that teacher's lack of information regarding ADHD general knowledge<sup>[14,19]</sup> which suggests the need for comprehensive training that covers general knowledge, symptoms, and treatment.

In the present study, It was noted that although 53.8% of our teachers know that ADHD is associated with any level of intelligence, only one third of them 37.7% know that there is a gender difference and only 17.7% knew that ADHD is a hereditary disease, which again reflects the diversity of knowledge of the teachers about the definite spectrum of the disorder. Evidence points to genetics factors as one of the greatest contributors to this disorder.<sup>[20]</sup> Having this knowledge should enable teachers to communicate better with the parents of children, to understand that one or both of the parents may have/had ADHD and to be realistic about structure at the home of the child with ADHD.

Another feature of ADHD is that it unfavourably affects the social, occupational and academic life of individuals, therefore, necessary measures should be taken with respect to these children to prevent development of such problems later in life.<sup>[1]</sup> In this line, it was found that only 66.2% of our teachers were aware that children with ADHD might have difficulties in learning and only 7.7% know that they have an increased tendency for addiction to alcohol and substance abuse. On the same context, and regarding the natural progress of the disorder, it was found that 28.5% of the teachers know that the disorder might be seen in adulthood and this indicate a great lack of knowledge and many misperception about the long term outcome of ADHD. A small group of children do not show significant ADHD symptoms when they reach adolescence. The overall majority of children continue to experience difficulties and for many children ADHD is a lifelong disorder <sup>[21, 22]</sup>. In the long term risk of this disorder, teachers should constantly try to create environments to help the children to succeed academically, emotionally and

socially.<sup>[14]</sup> A minority of teachers held the view that children will outgrow their symptoms by adolescence. Holding this view could imply that the seriousness of this disorder is overlooked. When adolescents with ADHD are compared with non-ADHD children, those with ADHD are at higher risk for school suspension, academic failure, dropping out of school and substance abuse.<sup>[23]</sup> This observed modest level of knowledge among our teachers raise the issue that the coming near future for children affected with ADHD is still questionable unless rigorous intervention is made to improve knowledge of our teachers about it.

Correlating the above finding with the demographic characteristics of the teachers shows that there was no statistically significant difference in the mean percentage of score reflecting overall knowledge of the teachers about ADHD with any of the studied demographic characteristics. This finding supports the finding of Kos et al.(2004)<sup>[15]</sup> in their study of Australian teachers and Kleynhans, (2005)<sup>[13]</sup>, but differs from the findings of Scitutto et al. (2000)<sup>[14]</sup>, indicating that teachers in the United states with more years of teaching experience obtained higher scores than teachers with less teaching experience.

Basically, the educational and training background of our teachers was illustrated through the questionnaire, which showed that 12.3% of them attended courses related to ADHD, 55.4% reported that they had inadequate information regarding ADHD during undergraduate stage. The association between previous training of teachers and most aspects of ADHD was not significant which reflect the inadequacy of training.

The sources of information about ADHD that the teachers named, particularly in this study, is important for school and university training programs to consider. First, university training programs which prepare future teachers may need to add or re-evaluate current requirements in the curriculum which include course work and field based experiences in working with children with special needs in a general education setting. Second, teachers who participated in this current study indicated receiving limited training from in-service programs provided by their schools.

Only 19.2% of the teachers surveyed and claimed that they had ADHD information, relied on books as their primary source of information about ADHD. This lack of reliance on the professional literature for information may also reflect some ambivalence in the field of education about the value of empirical data.

Misperception about ADHD is particularly resistant to change. In the present study, for example and consistent with previous research<sup>[14,15]</sup>, 90% of the teachers incorrectly believed that reducing dietary intake of sugar or food additives will effectively reduce the symptoms of ADHD. Numerous studies have been done on the effect of the diet on the symptoms of ADHD.<sup>[24,25]</sup> To date, no scientific support could be found for the influence of the diet as the cause for ADHD or that changing the diet could influence the severity of the symptoms. Dietary factors play a minimal role in.<sup>[24]</sup> Only a very small number (5% or less) of children, mainly pre-schoolers, showed a slight increase in inattentiveness or activity when sugar or food additives were included in their diet.<sup>[24]</sup> The majority of the teachers saw the way to reduction of sugar and or food additives in the diet of children as an effective way to reduce the symptoms of ADHD. When teachers have this view about the effect of the diet on ADHD symptoms, they may recommend that the child diet has to change.<sup>[14]</sup> This form of treatment provide false hope for a quick cure and eventually delay empirically supported treatment that have been proven effective.<sup>[16]</sup>

A person without knowledge may be cautious and seek information, but a person who holds a misperception may not seek additional information and may recommend misplaced advice.<sup>[14]</sup> It is important to be aware of the distinction between misperceptions and a lack of knowledge when interventions for children and training for teachers are planned. The content of the interventions and training should therefore be targeted at the teachers' level of understanding.<sup>[15]</sup>

Considering attitude of teachers towards their role in management of ADHD, it was revealed that 84.6% believed that teachers must have an active role in management, 15.4% stated that teachers may not necessarily be involved in the management of these children. This led us to consider that they lack information on this issue and should receive appropriate training. Also, despite the majority of the teachers (83.8%) recognized that teachers will play an active in ADHD management in the future, it is quite worrisome that their current level of knowledge could support their perspectives.<sup>[26]</sup>

## Conclusion

While this study provided additional information to the field of psychology and education in the area of teacher knowledge of ADHD, the largest limitations of this study included the small sample size which limits the generalizability of the study findings. However, the high

response rate may raise the ability to generalize the results. Another important limitation was that the sample of participants was only female, so the applicability of these results to male teachers might be limited.

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