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AWARENESS AND KNOWLEDGE OF ATTENTION DEFICIT HYPERACTIVITY DISORDER AMONG PRIMARY SCHOOL TEACHERS

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ABSTRACT

Background: School teachers play an important role in the assessment of children's behaviors, and have been considered one of the most valuable sources of information with regard to the diagnosis of ADHD. **Objectives:** To assess primary school teachers' knowledge of the symptoms and management of children with ADHD. **Subjects and methods:** A cross-sectional study was conducted in Al-Qassim Region, Saudi Arabia during 2015-2016included a representative random sample primary school teachers. Self-administered questionnaire was utilized for data collection included the Knowledge of Attention Deficit Disorder Scale (KADDS) in addition to socio-demographic and work-related questions. **Results:** The study included 255 teachers. More than half of them (57.3%) were males and having Bachelor degree (55.3%). About one-third of them have been read or attended awareness courses about ADHD among students (31.4%). Overall adequate ADHD knowledge was reported among only 11% of the teachers. The only significant factor associated with ADHD knowledge among teachers was their teaching experience as the highest rate of adequate knowledge was reported among teaches who has experience between 15 and 19 years in teaching (19.5%). Followed by those who had 4 years or less in teaching (18.9%) whereas the lowest rate was reported among teachers of 20 years or more of experience in teaching (4.6%), p=0.033. **Conclusion:** We observed an inadequacy of knowledge regarding ADHD among primary

school teachers in AlQasim. This inadequacy of knowledge raises serious questions about the screening of ADHD at the level of primary schools in AlQasim.

KEYWORDS: ADHD, Knowledge, primary schools, teachers.

INTRODUCTION

Childhood behavioral and mental problems are on the rise in terms of both public attention and the number of diagnoses (Pastor and Reuben, 2008). Currently, the most common and debated psychiatric diagnosis for children is attention deficit/hyperactivity disorder (ADHD) (Furman, 2005). Attention Deficit Hyperactivity Disorder (ADHD) is characterized by a chronic and pervasive pattern of developmentally inappropriate levels of inattentiveness, hyperactivity and impulsivity manifesting in early childhood (American Psychiatric Association, 2013)**.** Which then may continue into adulthood. Individuals with ADHD often exhibit deficits in one or more areas of executive functioning, including verbal working memory, emotion regulation, behavioural inhibition, motivation, planning, strategy generation and implementation, and self-monitoring (Barkley, 2005; Willcutt, Doyle, Nigg, Faraone & Pennington, 2005).

ADHD is one of the most prevalent developmental disorders, affecting 3–5% of school-aged children (Rowland, Lesesne, Abramowitz, 2002). Some studies reported prevalence rates varying among school-aged children from about 2% to18% (Skounti, Philalithis, Mpitzaraki, 2006; Polanczyk, de Lima, Horta, 2007; Ersan, Dogan, Dogan, Sumer, 2004; Benjasuwantep, Ruangdaraganon, Visudhiphan, 2002). On2010, a study was done in Saudi Arabia showed a prevalence of 2.68% among school aged children. (Alqahtani 2010). on2013, another study was done in Jeddah city showed a prevalence of 11.6% (M: F 7.4%:4.2%). (Homidi, Obaidat and Hamaidi, 2013).

School teachers play an important role in the assessment of children's behaviors, and have been considered one of the most valuable sources of information with regard to the diagnosis of ADHD (Stevens, Quittner, & Abikoff, 1998). Teachers are able to provide critical diagnostic information because core behaviour characteristics of ADHD are most likely to occur in the classroom. In addition to the direct informational role that teachers play in the diagnosis, they also play an indirect role through their referrals for ADHD evaluations. According to Sciutto, Terjesen and Bender-Frank (2000), teachers are often the first to tell parents to take their child for an ADHD assessment. Last, but not least if a child is diagnosed

with ADHD or other disorder and a treatment plan is established, teachers are responsible to follow an intervention plan in the classroom and assist children to achieve academically and socially (Vereb&DiPerna, 2004). Children displaying symptoms of ADHD might therefore be assisted in order to function to their full potential and support their well-being. This could contribute to a more effective education system, which could thereby prepare all learners thoroughly in becoming productive members of our emerging economy **(**Topkin, Roman, 2015**).**

Most teachers attributed their knowledge about ADHD to books and colleagues. Teaching experience and prior training was positively correlated with knowledge of ADHD. (Anil Shetty, Sanjeev Rai, 2014). Taken on the whole, the results found here suggest that high, and to some extent average, knowledge of ADHD may impact teachers' behaviors and perceptions in positive and important ways (e.g., willingness to seek help for children with ADHD, perceive the benefit of a range of treatments), and thus agree with and buttress experts' calls for teacher education about ADHD (Ohan, Cormier, Hepp, Visser, and Melanie, 2008). It is estimated that at least one child in every education classroom has attentiondeficit hyperactivity disorder (ADHD) (DuPaul and Stoner, 2003). Impairment in academic pursuits is common for children with ADHD and can be pervasive, often negatively affecting interpersonal adjustment, classroom productivity, and academic achievement (Barkley, Fischer, Smallish, and Fletcher, 2006; Frazier, Demaree, andYoungstrom, 2004). Such children underperform in schoolwork productivity and mastery of age-appropriate material and skills (Ek, Westerlund, Holmberg, and Fernell, 2011; Powers, Marks, Miller, Newcorn, andHalperin, 2008)**.** Trends regarding school maladjustment and prevalence estimates (e.g., CDC, 2009) and other data suggesting teachers will likely encounter at least one student with ADHD during each year of service (Jerome, Gordon and Hustler, 1994; Ohan, Cormier, Hepp, Visser and Strain 2008) indicate that it is important to convey adequate understanding of ADHD and related interventions to teacher trainees **(**Canu and Mancil, 2012**)**.

This study aimed to assess primary school teachers' knowledge of the symptoms and management of children with ADHD.

Subjects and methods

A cross-sectional study wasconducted in Qassim during 2015-2016. The study population included primary school teachers from the cities of Al-Qassim region. The sample size was

calculated according to the following established formula for determination of sample size[n]:

$$n = \frac{Z^2 * (p) * (q)}{c^2}$$

A multistage stratified random sample method was used where the total size of the population was sampled. The sample was first stratified into male and female schools with a ratio of 1:1, while the second stratification is for selecting teachers from selected schools for male and female with a ratio of 1:1. These steps are done by the use of research randomizer software.

The teachers were given a questionnaire to see their ability to identify signs and symptoms of ADHD based on DSM-IV-TR criteria were evaluated. Sociodemographic information such as gender, teaching experience and prior training was elicited. The teachers were asked about any prior suspicion of ADHD in the classroom and their response to those suspicions in terms of reporting it to a superior, parental counselling or referral to a doctor. The source of their knowledge and the factors influencing their perception of ADHD were assessed. The teachers were asked about the need for a workshop/module on ADHD and their willingness to attend it. The knowledge of ADHD among the teachers were assessed by their awareness about 11 diagnostic symptoms and signs for ADHD based on the Diagnostic and statistical manual (DSM-IV-TR) criteria. After data collection, Data were entered and analyzed using SPSS v.22. Regarding knowledge questions, correct answers were assigned a score of "1" whereas incorrect or unknown answers were assigned a score of "0". Total score and percentage was computed for each participant. Those scored below 60% were considered as having "inadequate score" whereas those scored 60% or more were considered as having "adequate score. Chi-square test was used to test for the association between ADHD knowledge and possible associated factors and p-value less than 0.05 was considered statistically significant.

RESULTS

The study included 255 teaches. Their baseline characteristics are summarized in table 1. More than half of them (57.3%) were males and having Bachelor degree (55.3%). About one-third of them (34.1%) had an experience of 20 years or more in teaching and has been read or attended awareness courses about ADHD among students (31.4%). Also, approximately one third of the teachers (33.7%) ever transferred a student to students` guide or a health unit

because of symptoms of ADHD. More than a third of them (39.2%) thought that "the evil eyes" can cause ADHD.

From table 2, it is seen that majority of teachers could recognize correctly that ADHD children are frequently distracted by extraneous stimuli (84.3%). parent and teacher training in managing an ADHD child are generally effective when combined with medication treatment (84.3%), ADHD children often fidget or squirm in their seats (83.5%), In order to be diagnosed as ADHD, a child must exhibit relevant symptoms in two or more settings (e.g., home, school) (83.5%) and current wisdom about ADHD suggests two clusters of symptoms: One of inattention and another consisting of hyperactivity/impulsivity (80.4%). On the other hand, only 22.4% of them knew that in very young children (less than 4 years old), the problem behaviors of ADHD children (e.g. hyperactivity, inattention) are not distinctly different from age-appropriate behaviors of non-ADHD children, children with ADHD generally not display an inflexible adherence to specific routines or rituals (23.5%), behavioral/psychological interventions for children with ADHD don`t focus primarily on the child's problems with inattention (23.9%), individual psychotherapy is not usually sufficient for the treatment of most ADHD children (23.5%), most ADHD children don`t "outgrow" their symptoms by the onset of puberty and subsequently function normally in adulthood (23.9%) and reducing dietary intake of sugar or food additives is not generally effective in reducing the symptoms of ADHD (21.6%).

The average percentage of correct answers was 49.9%.Overall adequate ADHD knowledge was reported among only 11% of the teachers as displayed in figure 1.

The only significant factor associated with ADHD knowledge among teachers was their teaching experience as the highest rate of adequate knowledge was reported among teaches who has experience between 15 and 19 years in teaching (19.5%). Followed by those who had 4 years or less in teaching (18.9%) whereas the lowest rate was reported among teachers of 20 years or more of experience in teaching (4.6%), p=0.033. Table 3.

Table 1: Baseline characteristics of the participants (n=255).

	Frequency	Percentage
Gender		
Male	**146**	**57.3**
Female	**109**	**42.7**
Highest qualification		
Diploma	**109**	**42.7**
Bachelor	**141**	**55.3**
Others	**5**	**2.0**
Years of teaching experience		
≤4	**37**	**14.5**
5-9	**37**	**14.5**
10-14	**53**	**20.8**
15-19	**41**	**16.1**
≥20	**87**	**34.1**
Ever reading about or attending awareness courses about ADHA among students		
Yes	**80**	**31.4**
No	**175**	**68.6**
Ever transferring a students to students` guide or a health unit because of symptoms ofADHD		
Yes	**86**	**33.7**
No	**169**	**66.3**
Thinking that "the evil eyes" can causeADHD		
Yes	**100**	**39.2**
No	**155**	**60.8**

Table 2: Teachers` responses to knowledge statements regarding ADHD among students.

Statements	**Correct answers**	
	No.	**%**
1. Most estimates suggest that ADHD occurs in approximately 15% of school age children. **(False)**	72	28.2
2. Current research suggests that ADHD is largely the result of ineffective parenting skills. **(False)**	136	53.3
3. ADHD children are frequently distracted by extraneous stimuli. **(True)**	215	84.3
4. ADHD children are typically more compliant with their fathers than with their mothers. **(True)**	110	43.1
5. In order to be diagnosed with ADHD, the child's symptoms must have been present before age 7. **(True)**	193	75.7
6. ADHD is more common in the 1st degree biological relatives (i.e. mother, father) of children with ADHD than in the general population. **(True)**	101	39.6
7. One symptom of ADHD children is that they have been physically cruel to other people. **(False)**	101	39.6
8. Antidepressant drugs have been effective in reducing symptoms for many ADHD children. **(True)**	117	45.9
9. ADHD children often fidget or squirm in their seats. **(True)**	213	83.5

10. Parent and teacher training in managing an ADHD child are generally effective when combined with medication treatment. **(True)**	215	84.3
11. It is common for ADHD children to have an inflated sense of self-esteem or grandiosity. **(False)**	149	58.4
12. When treatment of an ADHD child is terminated, it is rare for the child's symptoms to return. **(False)**	113	44.3
13. It is possible for an adult to be diagnosed with ADHD. **(True)**	106	41.6
14. ADHD children often have a history of stealing or destroying other people's things. **(False)**	115	45.1
15. Side effects of stimulant drugs used for treatment of ADHD may include mild insomnia and appetite reduction. **(True)**	188	73.7
16. Current wisdom about ADHD suggests two clusters of symptoms: One of inattention and another consisting of hyperactivity/impulsivity. **(True)**	205	80.4
17. Symptoms of depression are found more frequently in ADHD children than in non-ADHD children. **(True)**	151	59.2
18. Individual psychotherapy is usually sufficient for the treatment of most ADHD children. **(False)**	60	23.5
19. Most ADHD children "outgrow" their symptoms by the onset of puberty and subsequently function normally in adulthood. **(False)**	61	23.9
20. In severe cases of ADHD, medication is often used before other behavior modification techniques are attempted. **(True)**	137	53.7
21. In order to be diagnosed as ADHD, a child must exhibit relevant symptoms in two or more settings (e.g., home, school). **(True)**	213	83.5
22. If an ADHD child is able to demonstrate sustained attention to video games or TV for over an hour, that child is also able to sustain attention for at least an hour of class or homework. **(False)**	84	32.9
23. Reducing dietary intake of sugar or food additives is generally effective in reducing the symptoms of ADHD. **(False)**	55	21.6
24. A diagnosis of ADHD by itself makes a child eligible for placement in special education. **(False)**	91	35.7
25. Stimulant drugs are the most common type of drug used to treat children with ADHD. **(True)**	99	38.8
26. ADHD children often have difficulties organizing tasks and activities. **(True)**	194	76.1
27. ADHD children generally experience more problems in novel situations than in familiar situations. **(False)**	66	25.9
28. There are specific physical features which can be identified by medical doctors (e.g. pediatrician) in making a definitive diagnosis of ADHD. **(False)**	85	33.3
29. In school age children, the prevalence of ADHD in males and females is equivalent. **(False)**	126	49.4
30. In very young children (less than 4 years old), the problem behaviors of ADHD children (e.g. hyperactivity, inattention) are distinctly different from age-appropriate behaviors of non-ADHD children. **(False)**	57	22.4
31. Children with ADHD are more distinguishable from normal children in a classroom setting than in a free play situation. **(True)**	209	82.0
32. The majority of ADHD children evidence some degree of poor school performance in the elementary school years. **(True)**	173	67.8
33. Symptoms of ADHD are often seen in non-ADHD children who come from inadequate and chaotic home environments. **(True)**	154	60.4

34. Behavioral/Psychological interventions for children with ADHD focus primarily on the child's problems with inattention. **(False)**	61	23.9
35. Electroconvulsive Therapy (i.e. shock treatment) has been found to be an effective treatment for severe cases of ADHD. **(False)**	160	62.7
36. Treatments for ADHD which focus primarily on punishment have been found to be the most effective in reducing the symptoms of ADHD. **(False)**	140	54.9
37. Research has shown that prolonged use of stimulant medications leads to increased addiction (i.e., drug, alcohol) in adulthood **(False)**	71	27.8
38. If a child responds to a stimulant medication (e.g. Ritalin), the child probably hasADHD **(False)**	107	42.0
39. Children with ADHD generally display an inflexible adherence to specific routines or rituals **(False)**	60	23.5

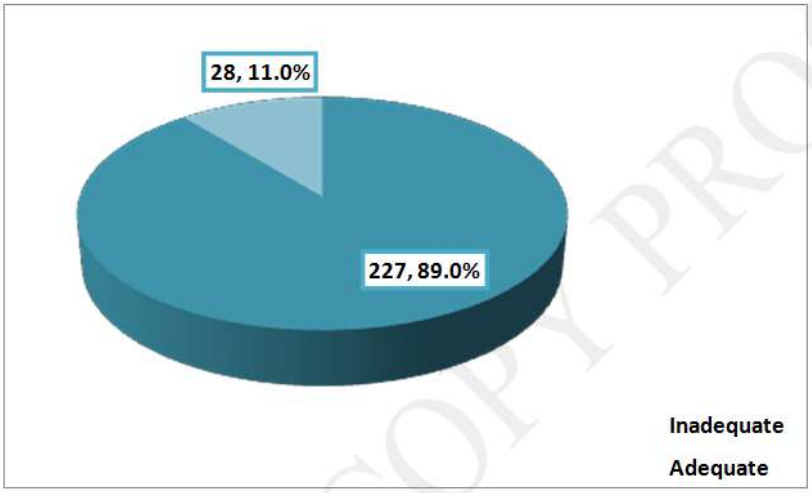

Figure 1: Level of knowledge regarding ADHD among primary school teachers, Qassim, KSA.

Table 3: Factors associated with ADHD knowledge among teachers

	ADHD knowledge		p-value
	Inadequate N=227 N (%)	**Adequate N=28 N (%)**	
Gender			
Male (n=146)	**129 (88.4)**	**17 (11.6)**	**0.695**
Female (n=109)	**98 (89.9)**	**11 (10.1)**	
Highest qualification			
Diploma (n=109)	**99 (90.8)**	**10 (9.2)**	**0.096**
Bachelor (n=141)	**125 (88.7)**	**16 (11.3)**	
Others (n=5)	**3 (60.0)**	**2 (40.0)**	
Years of teaching experience			
≤4 (n=37)	**30 (81.1)**	**7 (18.9)**	**0.033**
5-9 (n=37)	**35 (94.6)**	**2 (5.4)**	
10-14 (n=53)	**46 (86.8)**	**7 (13.2)**	
15-19 (n=41)	**33 (80.5)**	**8 (19.5)**	
≥20 (n=87)	**83 (94.5)**	**4 (4.6)**	

Ever reading about or attending awareness courses aboutADHD among students Yes (n=80) No (n=175)	 **68 (85.0)** **159 (90.9)**	 **12 (15.0)** **16 (9.1)**	**0.165**
Ever transferring a students to students` guide or a health unit because of symptoms ofADHD Yes (n=86) No (n=169)	 **77 (89.5)** **150 (88.8)**	 **9 (10.5)** **19 (11.2)**	**0.851**
Thinking that "the eyes" can causeADHD Yes (n=100) No (n=155)	 **89 (89.0)** **138 (89.0)**	 **11 (11.0)** **17 (11.0)**	**0.994**

DISCUSSION

Despite the expected essential role of teachers in the recognition and management of ADHD, in the current study, the overall knowledge regarding ADHD among primary school teachers in Al-Qassim Region, Saudi Arabia was inadequate as adequate knowledge was reported among only 11% of them and the average percentage of correct answers was 49.9%. This findingis comparable tothat reported by (Kleynhans, 2005) who observed an average of 42.6% for correct answers among teachers and those reported by (Sciutto, 2000) who reported an average of 47.8% for correct answers for teachers in USA. However, the figure of the current study is lower than that reported by (Kos, 2004) who reported that 60.7% of the items on the knowledge questionnaire were correctly answered by teachers in Australia.

In accordance with the present study, inadequate lack of knowledge regarding ADHD also has been reported from various studies carried out in Saudi Arabia (Munshi2014), USA (Canu and Mancil 2012), Iran (Ghanizadeh, Bahredar and Moeini2006), Australia (Ohan, Cormier, Hepp, Visser and Strain, 2008).

Thedifference between studies could be explained by using different tools for data collection in various studies as well as recruiting teachers from different school levels (primary schools and/or kindergartens).

In accordance with others, (Kleynhans 2005; Munshi2014) teachers in the current study expressedhigher knowledge about symptoms and diagnosis areas. However, the results showed that almost one-quarter of teachers did not recognize that the child's symptoms must have been present before age of 7 years and more than half of the teachers didn't know that it is possible for an adult to be diagnosed with ADHD.

Responses of the teachers to items regarding general information about ADHD such as prevalence, course and nature of the disorderand items regarding therapy were lower than those on symptoms of the disorder. It has been reported that it will be difficult to providebehavior management program within classroom if teachers have a poor knowledge on the nature and treatment of ADHD. (Barkley 1998). These results suggest that future interventional educational programs should focus not just on symptoms of ADHD, but also on its other characteristics.

An essential feature of ADHD is that it unfavorably affects future academic life of individuals, therefore, important measures should be taken with respect to these children to prevent development of such problems later in life. (Sonuga 2005). In this line, it was found that almost one third of teachers recognized that majority of ADHD children evidence some degree of poor school performance in the elementary school years. This finding raise the issue that intervention is needed to improve knowledge of our teachers about this fact.

The present study revealed that knowledge regarding ADHD was significantly higher among more experienced teachers and newly graduated teachers than others. This could be attributed to the adequacy of the college curriculum regarding ADHD also enforced the role of experience in gaining information regarding this disorder.

In the current survey, almost one third of teachers have been read or attending awareness courses about ADHD among students and ever transferred a student to students` guide or a health unit because of symptoms ofADHD. However, the association between previous training and experience of teachers and knowledge about ADHD was not significant which could be attributed to inadequate training.

CONCLUSION

In conclusion, we observed an inadequacy of knowledge regarding ADHD among primary school teachers in Al-Qassim. This inadequacy of knowledge raises serious questions about the screening of ADHD at the level of primary schools in Al-Qassim.

The study has two important limitations that should be mentioned. It included only primary school teachers ignoring those of kindergarten which considered an important period for discovering this disorder. Its cross-sectional design doesn’t allow testing the causality between inadequate knowledge and possible associated factors. Despite of these limitations,

the study has significance by providing additional information regarding primary schoolteachers` knowledge of different aspects of ADHD. In the light of the present study`s results, primary school teachers should be offered in-service training in ADHD, as well as in behavioural management and academic interventions with regard to children with ADHD.

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