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Research article

Teacher knowledge, training and acceptance of students with ADHD in their classrooms: Qatar case study

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ABSTRACT

The presence of Attention Deficit Hyperactivity Disorder (ADHD) is similar to other neurological disorders of the brain in that it lacks a simple specific blood or other straightforward test to confirm the disorder. Parent and teacher rating scales are the standard measure of the presence of ADHD. Most referrals to medical professionals for an ADHD assessment are made by the student's teacher. Qatar schools are staffed differently than other countries in the region, with less than 25% of teachers being local Qataris. Given the appointment of teachers from surrounding nations, there is a lack of quality control for teacher preparation with each nation setting their own standards for teacher education and professional development. Without adequate knowledge of ADHD, teachers may not be able to accurately complete the teacher rating scales needed by medical professionals to assist in confirming a diagnosis of ADHD. Therefore, it is important that teachers understand the characteristics of ADHD, and that ADHD is a neurobiological disorder. This descriptive study explores teacher knowledge and perceptions of ADHD. The instrument for this study was derived from the Knowledge of Attention Deficit Disorders Scale (KADDS) adapted to fit the local Qatari context and study objectives. Participants were recruited from a random sample of Qatar Independent Schools. Frequency distributions and t-tests were conducted to determine ranges of responses, and relationships between responses and four demographic variables. Results are reported for demographics, teacher knowledge and teacher perceptions and beliefs. The results suggest that current clinical and scientific knowledge of the symptoms, causes and treatment of ADHD is not included in teacher preparation or professional development programs. Thus the ability of teachers to assess eligible students and to monitor medications for students with ADHD comes under question. Promising results include the fact that many teachers reported that they did not know the answers to more than 35% of the survey questions and therefore their knowledge and attitudes may be more readily influenced through workshops and in service programs.

Keywords: Attention Deficit Hyperactivity Disorder, ADHD, teachers education, inclusion

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INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD), a neurobiological disorder of the brain, is one of today's most common and controversial diagnoses in children. According to the Diagnostic and Statistical Manual of Psychiatric Disorders Edition V, ADHD is diagnosed in a person who shows a persistent pattern of hyperactivity and or inattention that affects their day-to-day functioning.[1] There are three subtypes of ADHD: 1) primarily hyperactive; 2) primarily inattentive; 3) combined hyperactive and inattentive. Two-thirds to three-quarters of those diagnosed are considered to have the combined form of ADHD. In addition, the difficulties must be documented in at least two different situations, be present before age 12 and clearly be interfering with the person's functioning in life. Symptoms of inattentive subtype include: difficulty giving close attention to activities or instructions when needed, does not seem to listen when spoken to, difficulty completing series of instructions, struggles with organization, seems to lack cognitive stamina, easily distracted, loses things and is forgetful in daily activities. Symptoms of hyperactive/impulsive subtype include: fidgets with hands, feet or squirms in seat, leaves place when staying in one spot is expected, runs about and climbs excessively, on-the-go – moving all the time, unable to play at one thing for more than a few minutes, talks excessively, often calls out answers before the question has been asked, difficulty turn-taking, and often interrupts.[1]

Prevalence indicators in the United States for ADHD in children 6–18 years of age were reported at 9% by the Center for Disease Control.[2] In Qatar, one study of the prevalence of ADHD in Qatar government school aged children 6–12 years indicated a range of 9.4% to 18%, based on teacher ratings of students suspected of having ADHD in their classrooms.[3] Similar to other neurobiological disorders, ADHD lacks a specific blood test or other medical test to determine its presence. Although studies using Magnetic Resonance Imaging (MRI) have shown differences in the cortical structure in people with ADHD, these studies are not conclusive and do not qualify as a standard for diagnosis.[4,5] Procedures to identify genetic markers for ADHD are still in their infancy and currently lack the sophistication to be employed in diagnosis.[6] Thus ADHD is diagnosed with a high reliance on parent and/or teacher ratings, family and medical history, interviews and observations.

WHY STUDY TEACHER KNOWLEDGE OF ADHD?

Most diagnoses of ADHD include rating scales completed by teachers and parents, which have been developed and normed in North America and the UK. To apply the same Diagnostic and Statistical Manual of Mental Disorders (DSM IV)[7] scales for the diagnosis of ADHD in the Middle East may not provide valid or reliable indicators for two major reasons. First, students in the Middle East come from different cultures with different norms and expectations for behaviour. Second, schools in the Middle East seem to have different standards for behaviour than schools where the ratings scales were normed (USA, UK).[8,9]

However, teachers and parents of children suspected of having ADHD usually become aware of a possible problem at the onset of formal schooling, when the ability to attend for longer periods of time becomes an expectation for success. Inattentive children demonstrate more difficulty following directions and rules in a structured setting, such as a school.[3] Typically, they perform more poorly than their same age peers on formal academic assessments.[10] Behaviours such as getting out of their assigned seats, asking questions, interrupting the work of other students and not completing the required amount of work in class require more teacher time than the behaviours of the attentive student. Students with more severe hyperactive and impulsive characteristics cause more difficulty in the school environment than those students with a profile of attention difficulties. Teachers often place the blame for such behaviours on inadequate parenting skills, or label the child as lazy and unmotivated.[11] When teachers understand that students with ADHD have a neurological disorder that can be responsive to medical and instructional intervention, they can better understand that ADHD is not a matter of being lazy, or unmotivated, or due to ineffective parenting.

Given the prevalence of ADHD of close to 10% in any classroom, it is important that teachers understand the characteristics and be able to recognize children with ADHD, to understand their educational and social interaction needs, and to learn approaches to assist them to achieve academic and social success in the classroom. Teachers need training to understand and accept ADHD as biological and not just environmental in nature. They must be willing and able to implement behavioural strategies to assist children to manage their own behaviour so that they can be more successful in the classroom. For example, the American Pediatric Association recommends behavioural strategies as the first line of interventions to support more appropriate behavioral responses of

children with ADHD.[12] Teachers must understand that some children with ADHD may need referral to other agencies and if teachers are not able to work with the child in their classroom, teachers must know how to seek assistance in developing behavioural plans to address the different needs of their students with ADHD. Teachers must be ready and willing to assist and guide their students with ADHD to become successful productive members of school and society using all available services and strategies.

Teachers are in an excellent position to provide feedback on the effects of medication used to assist some students with ADHD in learning to control their symptoms. Teachers are a source of referral of a student for an assessment to determine the presence or absence of ADHD.[13,14] Knowledge of the characteristics of ADHD is important for teachers when they complete the rating scales used to diagnose and monitor the effects of ADHD on a child's ability to cope in the classroom and with peers.

Teachers who are unprepared to teach a student with ADHD experience more stress than teachers without a student with ADHD.[15] When stressed, teachers may use more frequent reprimands with a student with ADHD, peers are quick to notice, thus negatively affecting the student's self-esteem.[16] Corrective or punitive actions of a teacher can result in corresponding actions by students, resulting in the further marginalization of the student with ADHD. Typically, they would like to behave differently, but the impulsivity causes them to act without thinking and thus they are often reprimanded in front of their peers. When teachers gain knowledge of ADHD as a neurological disorder of the brain, they can provide instruction to that student (rather than punitive feedback and reprimands) showing that the student is accepted in the classroom by his teachers, and thus more likely to be accepted by his peers.

Hyperactive and impulsive children are often the cause of family turmoil and strife. Parents are aware of the child's difficulty following rules, his impulsivity and his difficulty with change. They describe the child in one of two ways: the problem being with the school or the teacher, or a problem within their child. Parents often say, "He just doesn't listen/try/care" or other negative comments about their child. Referring to children in Qatar, parents often blame the teachers: "Teachers (mostly foreign) do not understand my children" (M. Kamal, personal communication with author, 2012). The parents who locate the problem within their child often describe their lives as 'tip-toeing' around or 'walking-on-glass' waiting for the next moment that may cause their child with ADHD to "melt down" or "explode". The whole family is often frustrated, due to the child with hyperactive and impulsive behaviours, who takes much more effort to get up in the morning or to go to bed at night. Even eating or sitting at the table for a meal can be an ordeal. These parents often feel that they are inadequate parents or don't know how to control their own child. This guilt can cause family discord and produce more difficulty for the child with hyperactivity that needs constant, positive interventions.[17–19]

TEACHER PERCEPTIONS AND KNOWLEDGE OF ADHD IN QATAR

There is no empirical data in Qatar to describe teacher perceptions, knowledge of symptoms, or treatment of ADHD. Teacher recognition of special needs has begun in Qatar Independent Schools with the Supreme Education Council.[20] Students with ADHD create many challenges to the teacher in ensuring the student learns and does not disrupt the rest of the classroom. Most referrals to medical professionals for an ADHD assessment are initiated by the child's teacher.[21] In addition to knowing teaching strategies, the reliance of ADHD identification on the teachers at the school increases the need for teachers to understand the characteristics of ADHD and accept and understand that ADHD is a neurological disorder.

OBJECTIVES OF THIS STUDY

This descriptive study explores teacher knowledge and perceptions of ADHD, specifically, knowledge and beliefs of K-12 schoolteachers in independent schools in Qatar. The effect of selected demographic variables that might influence teacher knowledge and perceptions concerning ADHD are analyzed.

Because Qatar schools employ many teachers from other countries, it would be useful in hiring practices to understand the level of knowledge of teachers from different countries who might have different amounts of training and experience.

The following research questions guided the study:

(1) What knowledge do Qatar Independent School teachers hold about
   a. the nature and causes of ADHD?

b. the symptoms and diagnosis of ADHD?
c. knowledge of treatment of ADHD?

(2) What are Qatar Independent School teachers' perceptions of ADHD as a medical diagnosis and the use of medication as a treatment option?

METHODOLOGY

This study employed a quantitative analysis of survey data of a sample of teachers in Qatar Independent Schools grades one through twelve, using a forced choice survey as the means of data collection. Participants anonymously completed the surveys, and were advised to refrain from placing identifying marks on the survey. To encourage honesty, it was explained that both their answers and their schools would not be identified.

The survey was distributed to participants prior to a required workshop on ADHD at 10 randomly-chosen independent schools. One school per district was chosen from the 18 districts of greater Doha, Qatar with representation of equal numbers of boys and girls schools, grade one through twelve. No rural schools were included. Of the 282 possible teacher reports, 233 were completed (an 83% response rate), collected, and analyzed; this response rate was deemed adequate for analyzing the data.[22] It must be noted that of the 17% that did not return the surveys, most were from one school which did not participate in the ADHD workshop.

INSTRUMENT

The instrument for this study was derived from the Knowledge of Attention Deficit Disorders Scale (KADDS), a 36-item, close-ended survey developed by Sciutto et al.[23] for use in their study of teacher perceptions of ADHD in six New York area public schools. This survey was adapted to fit the local Qatari context and study objectives. Although many of the statements are stated in terms originally intended for medical practitioners, and developed in English to be administered to teachers, the KADDS is one of the most widely-used tools to assess teacher knowledge of ADHD.[24] Internal consistency of the original instrument, including pre and post changes in KADDS scores, was found to be good ($\alpha - 0.81$). KADDS has been adapted and administered in several other studies.[25,26] In the current study it was adapted from the original 36 questions, of which 7 were demographic, to 12 demographic questions and 22 questions on ADHD knowledge and perceptions. The 22 questions pertaining to ADHD were those most aligning with the current researched knowledge of ADHD. Demographic questions were expanded to better understand the sample in terms of nationality and education due to the nature of the expatriate teaching force in Qatar. Questions dropped from the original KADDS included questions related to medical treatments such as electro-convulsive therapy treatment and physical features of children with ADHD, that the authors were not interested or were more indicative of 2000 when the KADDS was developed. Translation to Arabic considered the current colloquialisms of Arabic.

Demographic questions were expanded to elicit more detailed information from teachers in Qatar, who are mainly expatriate teachers. With this large group of expatriate teachers, Qatar has little control over the quality of the teacher training. Twelve questions regarding participant knowledge of ADHD were asked in a True/False/Don't Know format. As suggested by Sciutto et al.,[23] participants were provided the *Don't Know* choice so the researchers could understand the actual knowledge levels of the participants and rather than their guesses. Questions that related to participant personal beliefs had a 5 point Likert-type scale for responses: Strongly Disagree, Disagree, Undecided, Agree and Strongly Agree.

CONSENT

Informed consent (in Arabic) was verbally obtained from participants. They were told they did not have to answer any part they did not feel comfortable with and that they could stop the survey at any time, returning the completed survey to the researchers was their choice. Of the 282 distributed surveys 233 were returned. Thus 49 participants exercised their right to not participate. There were 60 high school teachers, 77 middle school teachers and 96 primary school teachers who completed survey. Surveys with one or more answers incomplete were not discarded and incomplete answers ranged from 1.3% on the gender question to 10.3% on a Likert-rated question asking if prescription medication was needed for students with ADHD. The study was approved by Hamad Medical Corporation Medical

Research Center Institutional Review Board in June 2011 and the instrument was field tested with a group of graduate teachers at a local college. Furthermore, the instrument and instructions were available in both English and Arabic. The final version of the survey was translated into Arabic by a local translator and back by a research team member, ensuring correct translation of the document.

RESULTS

Results are reported in three sections: demographics, teacher knowledge, and teacher perceptions and beliefs. First, demographics of the participating teachers are described. Second teacher knowledge regarding ADHD is summarized and finally, teacher perceptions towards students with ADHD are reported.

1. Demographics

The ten participating Qatar independent schools were chosen randomly, one from each of 10 districts in greater Doha, comprising a representative sample of all independent schools in the greater Doha, Qatar area.[27] All surveys were distributed and collected between November 2011 and January 2012.

National origin. The participating teachers represented 22 countries with the greatest percentage of teachers coming from Jordan (24.5%), Egypt (23.2%); 16.3% came from Qatar, and 6.9% of the teachers in the sample came from Syria. Eighteen countries represented the remaining 29.1% of the teachers, ranging from 0.4% to 3.9% per country. This aligned fairly closely with the[20] data on teacher origin. All teacher surveys were included in this study, including the teachers of Qatari origin.

Teaching experience. To understand the participants' teaching experience, ranges were provided for responses. The percentages in each category included a) 20.2% reported less than 5 years experience teaching; b) 22.7% reported between 5–10 years experience teaching; c) 21.5% reported between 11–15 years experience teaching; d) 16.2% reported between 16–20 years experience teaching; and e) 18% reported more than 20 years experience teaching.

Education. The majority of participants (69.5%) had completed a Bachelor's degree, 23% with Master degree. Those who reported less than a college degree included 4.4% (3% did not answer the question on education). It must be noted that not all those with a bachelor's degree had training in pedagogy: 27.9% did not have training in pedagogy or hold Bachelor of Education.

Experience teaching students with ADHD. Notably, 54.5% stated that they had taught a student with ADHD. However, when asked about where they had learned about ADHD, 54.5% of the teachers stated that they had learned about ADHD from a book or the internet, 39.5% had learned about ADHD from a university class or a workshop, and 30% reported that they had learned from another teacher. Teachers could report more than one source for their knowledge of ADHD.

2. Teacher knowledge about ADHD

Given twelve questions to elicit knowledge of ADHD, teachers selected from three choices: True, False or Don't Know. Overall teachers chose "Don't Know" on the knowledge questions 39.7% of the time. They chose the correct answer 31% of the time. Some of these statements are false assumptions or incorrect knowledge that pervades teacher staff room hearsay, that have been passed from one generation of teachers to the next.[21]

The authors classified these separately to better understand how hearsay could affect teaching practices. The overall average of percentage of correct answers in each category are detailed in three categories: a) Prevalence, b) Causes of ADHD, and c) False Assumptions about ADHD (and its treatment).

Prevalence. Teachers were knowledgeable about the prevalence of ADHD. Overall, 53.9% correctly answered the two questions related to prevalence of ADHD while 5.3% answered incorrectly.

Item 1. More boys than girls have ADHD. This true statement was answered correctly by 56.7% of the participants with 32.6% answered Don't Know

Item 4. The percentage of students thought to have ADHD is 4–7%. This true statement was answered correctly by 47.7% of participants while 47.2% answered Don't Know.

Causes. The overall average for the three items related to causes revealed that 31.3% of the participants answered correctly and 25.9% incorrectly.

Item 2. Children have ADHD because of home life. This false statement was answered correctly by only 20.7% of participants with the majority, while 52.7 % reported it as a true statement.

Item 5. ADHD can be inherited. This true statement was answered correctly by 48.6% of participants with 47.2% answering Don't Know.

Item 6. There are 3 subtypes of ADHD. This true statement was answered correctly by 24.7% of participants with the majority of 69.8% answering Don't Know.

False Assumptions. Seven items referred to commonly held beliefs that do not reflect current knowledge about ADHD treatment (i.e., false assumptions). More teachers selected True or False than answered Don't Know. Overall, 28.8% of the participants answered these false assumptions correctly, an equal percentage (28.8%) believed the false assumptions about ADHD were true and 43.4% reported Don't Know.

Item 3. Medication for ADHD ensures learning. (False) 31.5 % of the participants believed this to be false, an equal percentage believed it to be true, and 35% reported Don't Know.

Item 7. ADHD is a medical disorder only treated with medication. (False) 58.9% of the participants agreed that this statement was false, 12% believed it was true, and 29.2% reported Don't Know.

Item 8. Medical procedures are useful in diagnosis of ADHD. (False) Notably, 40.6% of participants believed this false statement was true, 16.1% believed correctly that this statement was false, and 43.3% reported Don't Know.

Item 9. Positive response to medication equals ADHD diagnosis. (False) For this false statement, 24.1% of the participants correctly named this item as false, 25.5% reported it was a true statement, and 50.5% answered Don't Know.

Item 10. Medication improves academic performance. (False) On this false statement, 33.2% of the participants believed that medication did improve academics; 19.9% answered correctly that medication did not improve academic performance, and 46.9% reported they did not know.

Item 11. Medication is a cure for ADHD. (False) Interestingly 35% of the participants reported that medication was not a cure for ADHD, 17.1% believed medication cured ADHD, and 47.2% reported Don't Know.

Item 12. Medication is addicting and results in predisposition to other addictions. (False) For this false statement, 34.2% of the participants believed that medication was addicting, 13.7% correctly reported that medication for ADHD cannot be addicting, and 51.6% reported Don't Know.

3. Teacher perceptions towards students with ADHD

Ten questions about teacher beliefs and perceptions toward students with ADHD and the disorder were asked using a 5-point Likert-type scale for responses: Strongly Disagree, Disagree, Undecided, Agree and Strongly Agree. Due to the spread of the data and to assist in better understanding and reporting the data, the two upper and lower scales were collapsed into three categories: Agree, Undecided, and Disagree.

The percentages of teachers in each group are reported in Table 1. Interpretation of the ratings for perceptions and knowledge are discussed in the next section.

Teacher ratings of the ten questions about perceptions of students with ADHD illustrate the need for increased teacher professional development in this area. Teachers agreed (68.5%) that *ADHD should be a medical diagnosis*, conversely 63% agreed that *Teachers are trained to recognize ADHD.* It was promising to note that only 18.9% thought *ADHD should be treated with medication*, which suggests they may be aware that instructional adaptations are necessary.

Table 1. Participant perceptions toward students with ADHD.

Statement	% Disagree	% Undecided	% Agree
1. ADHD should be a medical diagnosis.	11.4	20.1	68.5
2. Teachers are trained to recognize ADHD.	16.9	20.1	63.0
3. ADHD should be treated with medication.	31.2	50.0	18.9
4. Teachers have sufficient understanding of the purpose of medication.	53.0	33.3	13.6
5. All students with ADHD should take medication.	40.0	43.9	16.1
6. Teachers should give feedback to parents and doctors re medication.	7.5	24.7	67.9
7. Medication causes mood swings.	6.8	41.3	51.8
8. Too many students are prescribed medication for ADHD.	24.7	52.6	22.8
9. Medication should be a last resort.	17.6	27.0	55.4
10. Teachers should be more involved in monitoring a child's response to medication.	13.8	31.3	54.9

Similarly 16.1% agreed that *All students with ADHD should take medication*. It was promising to see that teachers want to be part of the collaborative process. The majority agreed *Teachers should give feedback to parents and doctors regarding medication* (67.9%) and *Teachers should be more involved in monitoring a child's response to medication* (54.9%). Only 22.8% of the teachers surveyed stated *Too many students are prescribed medication for ADHD*. 52.6% were undecided and 55.4% agreed that *Medication should be a last resort*; however, the majority of teachers did not believe that *Teachers have sufficient understanding of the purpose of medication* (i.e., 13.6% agreed with the statement). Given their understanding that medication is not the only answer to working with students with ADHD, teachers in this sample showed their willingness to learn instructional strategies.

Analysis of differences by demographic variables. To determine which demographic variables influenced teacher ratings, the t-test was selected as the method of analysis. The t-test assesses whether the means of two groups are *statistically* different from each other. An alpha level of .05 was selected (i.e., five times out of a hundred, a statistically-significant difference would occur by "chance"). T-tests were calculated for four demographic variables: a) teaching experience, b) teacher experience working with a student with ADHD, c) teacher training in teaching pedagogy, and d) training in special education.

As shown in Table 2, a two-tailed analysis of variance was conducted to understand the influence of each demographic on the teacher answers to the questions. Not knowing the population of teachers, their education or experience and which direction the any influence of the demographics would play on the answers to the questions, a two-tailed test of variance was conducted. As seen in Table 2, the demographics of a) Years of Teaching Experience, b) Years of Education of each teacher; c) Training in Pedagogy; and d) At least one Special Education classes; all have a significant effect on teacher answers to the false assumption questions in this study. That is, teachers with more experience answered the questions about perceptions and misperceptions of ADHD correctly than teachers with less experience. Similarly, teachers with training in pedagogy correctly answered questions about perceptions and misperceptions of ADHD, compared to teachers with no training in pedagogy. Teachers with at least one special education class also correctly answered questions about perceptions and misperceptions of ADHD, compared to teachers with no special education classes.

DISCUSSION

Understanding the nature and causes of ADHD are essential for teachers if they are to accommodate all children in their classrooms. With teacher misperceptions and misunderstanding of ADHD, students are

Table 2. Results of the paired samples T-test: Influence of experience and education.

Demographic Perceptions & Misperceptions Variable	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Experience						
Boys vs girls adhd	1.157	1.819	.123	9.367	216	.000
Hyper due home	1.151	1.623	.110	10.494	218	.000
Meds = learn	.889	1.705	.116	7.660	215	.000
% ADHD	.901	1.768	.121	7.440	212	.000
Inherited	1.060	1.664	.113	9.347	214	.000
3 types adhd	.467	1.541	.106	4.414	211	.000
Education						
Boys vs girls adhd	1.463	1.153	.079	18.556	213	.000
Hyper due home	1.463	1.056	.072	20.363	215	.000
Meds = learn	1.164	1.012	.069	16.786	212	.000
% ADHD	1.214	1.164	.080	15.113	209	.000
Inherited	1.358	1.116	.077	17.725	211	.000
B.Ed						
Boys vs girls adhd	−1.023	1.089	.074	−13.811	215	.000
Hyper due home	−1.018	.955	.065	−15.744	217	.000
Meds = learn	−1.279	.930	.063	−20.157	214	.000
% ADHD	−1.250	1.092	.075	−16.662	211	.000
Inherited	−1.093	1.007	.069	−15.880	213	.000
Special Education Preparation						
Boys vs girls adhd	−1.322	1.064	.074	−17.797	204	.000
Hyper due home	−1.311	1.003	.070	−18.761	205	.000
Meds = learn	−1.606	.996	.070	−22.968	202	.000
% ADHD	−1.557	1.126	.079	−19.606	200	.000
Inherited	−1.411	1.029	.072	−19.484	201	.000

not likely to receive appropriate teaching strategies and may disrupt their own learning and that of others in the classroom. This study illustrated that teachers teaching in Qatar Independent Schools lack knowledge about ADHD causes and treatments and hold misperceptions about the disorder. It is optimistic to note that teachers in this study were willing to answer "Don't Know" which can be seen as a positive step in the learning process.

The misperceptions of teachers are noteworthy as they could influence the reliability of the most commonly used rating scales, based on the fact that many teachers in this study believed they knew which students in their class had ADHD and seemed certain they could recognize characteristics of ADHD. Although Stevens and Quittner[28] found no relationship between teacher knowledge, education or experience and teacher ability to correctly rate children with ADHD; the sample in the current study was comprised of teachers from a different cultural background and education. For example, in the cross-cultural study of teachers from New Zealand and those from the USA,[29] found many cross-cultural differences in teacher treatment of students with ADHD.

More than 52% of teachers in this study believed that *ADHD is caused by the child's home life*. In other words, they may be incorrectly and unfairly blaming the family for a student's behavior (impulsivity, hyperactivity and inattention), which are caused by a neurological disorder. This finding is higher than that of Barbaresi and Olsen[30] in their study of teacher knowledge in the USA, conducted more than 15 years ago, where only 41% blamed the ADHD symptoms on the child's family. Misperceptions such as this could be placing undue stress on families who are already experiencing more stress by virtue of having a child with ADHD.[17,18,31] In addition, teacher misperceptions of ADHD are more resistant to change whereas a person who states they "don't know" may be more open to new ideas.[23]

Another common misperception (held by 31.5% of the participants) was that *when a student takes medication it ensures learning*. This is a dangerous misperception that might lead teachers to refer students for medication when they are not learning without clear indications that the student has ADHD. Teachers need to understand that their teaching procedures and adaptations to meet the needs of all students in their classroom are the variables that ensure learning.

The third most common misperception (25.5%) of the teachers in this study was that if there is *a positive response when a student with ADHD is given medicine this ensures that the child has ADHD*. This belief could lead to students being medicated who do not have ADHD.

Furthermore, 58.9% of the participants did not believe that ADHD is a medical disorder only treated with medication; indicating that teachers understand non-medical interventions may be necessary at school. Academically, the majority of teachers believed the false statement: *Medications improve academics* (Item 10). Counter to this misperception,[32] found a small difference in academic performance in a longitudinal study (3 years) of 10,000 students of which 2844 had a diagnosis of one subtype of ADHD; therefore the difference could not be stated as an absolute statement. The majority of studies do not demonstrate an increase in academic performance with the use of stimulant medication for students with ADHD; instead they may show a short term improvement or improvement due to an increase in the amount of work completed; medication does not close the academic gap between the typical student and the student with ADHD.[33–35] These results emphasize that teachers need to understand that their instruction is related to the student's academic knowledge and understanding, and that they have agency over which children learn in their classrooms.

Responses to three of the perception questions are very promising for schools in this study. Although 62% of participants agreed that *teachers were trained to recognize ADHD*, the impact of this presumed knowledge was not apparent when examining answers to the questions on symptoms, causes, and treatments for ADHD. On the other hand, 68.5% agreed that *ADHD should be a medical diagnosis*, indicating that they may not be that quick to state "this child has ADHD" and would refer to medical personnel for confirmation of their concerns. As advocated by the,[12] teachers in this study agreed it is important for them to (a) *be part of the collaborative process with parents and medical personnel*, and (b) *monitor students with ADHD taking medication* (67.9% and 55.4% respectively). It is also promising that 55.4% of teachers agreed, and 27% reported they did not know, that *medication should be a last resort*. This indicates that teachers may be receptive to trying different strategies in the classroom before or concurrent with medication to assist the child in reaching his potential.

As one would expect, teachers with more experience and more education including training in pedagogy or training in special education have more knowledge about ADHD than teachers with less experience, education or no classes in pedagogy or special education. Nonetheless, teachers in this

study demonstrated lower levels of knowledge about ADHD than expected. These findings are corroborated by previous studies.[36,37]

Given the increases in the prevalence of students with ADHD into Qatari classrooms, school administrators need to be aware of the limitations revealed in this study. Considering the teacher's role in the identification, treatment and monitoring of children with ADHD, their levels of knowledge as well as their misperceptions about diagnosis illustrate the need for school personnel to receive more professional development in this area. An important implication from these results is that Qatar teachers are not receiving sufficient training in the areas of special education.

LIMITATIONS

Several limitations are discussed: the instrument used to collect the study data and the process used to administer the study instrument. The study sample included whole school staffs and a future study might consider a wider sample of all schools in Qatar. This sample of educators who are teaching in Doha, Qatar, may not be representative of the Middle East region as a whole, even though the majority of the teachers originated from Middle East countries other than Qatar (e.g., Jordan, Egypt, etc.). Although the instrument was designed for teachers, there were some difficulties in translation to Arabic. In the survey translation the term Attention Deficit Disorder, may not have been translated for adequate teacher understanding.. Thus Arabic teachers may not understand that the child who appears disinterested or not listening but quietly sits in the class may also have ADHD. This may also explain a lower-than-average prevalence of ADHD being reported in Arabic schools and may possibly affect the cutoff scores on traditional DSM IV checklists for ADHD. The researchers wanted the immediate response of the teachers and chose to have teachers complete the survey in a limited time; however, with more time to think about the questions, results may be different.

RECOMMENDATIONS

Although the limitations of the study (i.e., lack of adequate translation of hyperactivity; sample of educators who are teaching in Doha, Qatar, may not be representative of the Middle East region as a whole) must be taken into consideration when making recommendations based on the findings, the researchers believe that the findings have the potential to add value to those who rely on teacher ratings of students for identification of those with ADHD. The results of this study demonstrated the need for more professional development in the schools in Qatar to assist teachers in better understanding the symptoms, causes and their part in the treatment of children with ADHD. Follow up research to find changes professional development has effected on teacher knowledge and beliefs about ADHD are needed. Implications for teacher training illustrate the need for classes in special education as part of any undergraduate education degree in this region.

Teachers must gain an understanding that misbehavior may be caused by other factors such as lack of teacher control or inconsistent management strategies or other factors affecting the student. Referrals regarding ADHD may be avoided if teachers were capable of better management in the classroom. The findings of this study stress the important part schools play in educating teachers. Staff development in the area of ADHD is essential with follow up to evaluate the changes in teacher beliefs and knowledge.

CONCLUSION

Results of this study show that teachers in independent schools in Qatar lack sufficient knowledge about ADHD. They have many responsibilities, of which only one is the monitoring of symptoms and treatment of students with ADHD. Limited knowledge reduces their effectiveness. Inclusive education has brought more students with increased needs into the general education classroom.[20] This requires teachers to accommodate students with wider diversity. Teachers require knowledge about ADHD and to have the belief that they have agency over the achievement of all students.

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