

Awareness and knowledge of attention deficit and hyperactivity disorder among medical students of Qassim University in Saudi Arabia

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ABSTRACT

Background: Attention deficit hyperactivity disorder (ADHD) is a common neurodevelopmental disorder that affects multiple aspects of an individual's life. It is characterized by attention deficit, hyperactivity, and impulsivity. As it is linked to various comorbidities, individuals and families often find it difficult to cope with it. Therefore, early diagnosis and intervention are vital. **Aim:** This study examined the ADHD awareness and knowledge of medical students and interns at Qassim University, Saudi Arabia. **Method:** For this cross-sectional study, the convenience sample consisted of male and female, fourth- to fifth-year medical students and interns. Descriptive and inferential statistics were computed, and the results were tested against a significance threshold of 0.05. **Results:** The majority of students demonstrated good awareness (83.9%) and fair levels of knowledge (48.2%) of ADHD. Age, academic year, and noncompletion of pediatric and psychiatric classes were associated with poor awareness. Odds ratios (ORs) for poor awareness were lower for the older (>23 years) and fifth-year students as compared with the younger and fourth-year students. Students who had not completed pediatric and psychiatric rotations demonstrated poor awareness. **Conclusion:** Medical students had a good awareness of ADHD; however, they had insufficient knowledge. As such, their knowledge must be improved, which can be achieved through the promotion of continuous education of students and primary health care physicians. The inclusion of the topic of ADHD in pediatric and psychiatric courses is necessary for advancing the knowledge of medical students on ADHD.

Keywords: Attention deficit hyperactivity disorder, awareness, behavioral disorder, children, medical students

Introduction

Attention deficit hyperactivity disorder (ADHD) is a common neurodevelopmental disorder. It affects an individual's social, academic, and occupational functioning^[1] and is characterized by attention deficit, hyperactivity, and impulsivity.^[2] The prevalence of ADHD around the world varies. However, it can be as high as 20%.^[3] In the Kingdom of Saudi Arabia (KSA), its estimated prevalence rate is 5%, while in the United States of

America (USA), it is 9%.^[4,5] ADHD is associated with various comorbidities, such as psychiatric disorders, learning deficits, and sleep disorders.^[6-8] As such, individuals and families find it difficult to cope with it.

There are misconceptions about treating ADHD.^[9-11] Thus, to prevent the adverse effects of ADHD on an individual's academic, social, and daily functioning, early diagnosis, and management in a primary setting are vital^[12] because only having specialized ADHD medical centers is not an appropriate solution.^[7] Unfortunately, many medical students and primary health care providers, both internationally^[9-11,13,14] and locally,^[1-8,12,15] were

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possessed suboptimal levels of knowledge about the classification and early management of ADHD. Moreover, there is a lack of research on medical students' knowledge of ADHD in Qassim. Thus, in this study, we examined the awareness and knowledge about ADHD in fourth- to fifth-year medical students and interns at Qassim University.

These results may be useful in modifying future teaching techniques, which ultimately promote increased awareness and knowledge of ADHD among medical students, which is essential for their career as physicians. As medical students and interns are eventually going to become the front liners in health care centers and hospitals, they must be aware and knowledgeable of ADHD, especially in terms of early recognition, referral, diagnosis, and management.

Method

Research design

For this cross-sectional study, the convenience sample consisted of fourth- to fifth-year medical students and interns from the male and female branches at the Qassim University College of Medicine. The sample completed previously validated self-administered questionnaires. The Qassim University was established in 2004 by merging the two Qassim branches of Imam Mohammad Ibn Saud Islamic University and King Saud University. This college of medicine has a problem-based learning system. It admits approximately 120 students each year, with approximately 450 forming the entire student body. This study's protocol was approved by the subcommittee of the Health Research Ethics, Deanship of Scientific Research, Qassim University.

Sample and sampling technique

This study was conducted using a convenience sample consisting of male and female, fourth- to fifth-year medical students and interns from the Qassim University College of Medicine. The required sample size was not computed, as it was the intention to include all students from the two grade levels.

Data collection

Data were collected with a valid, 25-item, self-administered questionnaire,^[1] which assessed the demographics, educational experience, preferred specialization, and awareness of ADHD. Their knowledge of ADHD was assessed with items that required them to identify features of ADHD based on the Diagnostic and Statistical Manual of Mental Disorder, Fifth Edition (DSM-V criteria). One of the researchers assisted the students and collected questionnaires immediately upon completion. This was done to avoid discussion of the study material during the distribution and completion of the questionnaires.

Statistical analyses

Microsoft Excel and the Statistical Package for the Social Sciences (SPSS) software, version 20, were used to conduct

the statistical analyses. Descriptive statistics were computed for categorical (frequencies, percentages) and continuous variables (means, standard deviation [SD]). A Chi-squared test was used to derive statistical inferences and regression analysis was used to compute the odds ratios (ORs) for the main study variables; $P \leq 0.05$ was indicative of a statistically significant result.

Overall awareness was assessed using 21 questions. The correct and incorrect answers were coded as 1 and 0, respectively. Composite scores (i.e. the sum of individual item scores) ranged from 1 to 21. Based on a 60% cutoff score, participants were classified as either "poor" if their scores were between 1 and 13 or "good" if their scores were between 14 and 21.

Results

The sample consisted of 224 medical students between the ages of 21 and 28 years (Mean = 23.8; men = 58.9%). Seven students were married, while one was divorced, and three were parents. The sample included more fifth-year (40.6%) than fourth-year students (39.7%); the rest of the participants were interns. Furthermore, 47.3% and 60.7% of them had completed pediatric and psychiatric courses, respectively. Regarding future occupation, the majority (15.6%) of the participants wanted to be pediatricians, closely followed by general practitioners (15.2%), and 13.4% wanted to become other types of doctors like neurologists (12.1%) and psychiatrists (10.7%). Only 8% had a family history of behavioral disorders [Table 1].

The students' overall knowledge of ADHD was fair (48.2%) [Table 2]. More than 70% knew the expansion of the abbreviation "ADHD" [Figure 1]; 46.4% and 31.7% reported that there were two or three types of ADHD, respectively. Almost all (94.6%) of them disagreed with the statement, "A child with difficulty paying attention should be diagnosed with ADHD," and they agreed that input of both parents and teachers were needed to detect ADHD. Furthermore, 67.9% of them indicated that they would refer anyone suspected of having ADHD to a specialist, and 29.5% of them reported that they would confirm the diagnosis. Almost all (96.9%) students believed that ADHD affects academic performance. However, 77.7% of them

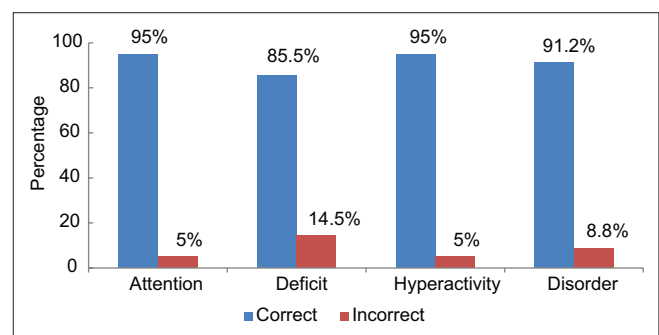


Figure 1: Percentages of students who correctly expanded "ADHD" (attention deficit hyperactivity disorder)

Table 1: Sociodemographic characteristics of the participants (n=224)

Variable	n (%)
Age group (Years)	
21-22	23 (10.3)
23-24	146 (65.2)
>24	55 (24.6)
Gender	
Male	132 (58.9)
Female	92 (41.1)
Marital status	
Single	216 (96.4)
Married	7 (3.1)
Divorced	1 (0.40)
Have children	
Yes	3 (1.3)
No	221 (98.7)
Academic year	
Fourth year	89 (39.7)
Fifth year	91 (40.6)
Intern	44 (19.6)
Completed pediatric course	
Yes	106 (47.3)
No	96 (42.9)
Currently completing a pediatric course	22 (9.8)
Completed psychiatric course	
Yes	136 (60.7)
No	88 (39.3)
Preferred area of specialization	
Neurology	27 (12.1)
Pediatrics	35 (15.6)
Psychiatry	24 (10.7)
Surgery	30 (13.4)
Medicine	34 (15.2)
Other	74 (33.0)
Family history of behavioral disorders	
Yes	18 (8.0)
No	206 (92.0)
Type of behavioral disorder*	
ADHD	4 (22.2)
Autism	3 (16.7)
Intellectual disability	3 (16.7)
Schizophrenia	2 (11.1)
Other	6 (33.3)

*Among individuals who had a family history of behavioral disorders. ADHD=Attention deficit hyperactivity disorder

disagreed with the statement, “A child with ADHD must be with a psychiatrist or neurologist in school.” In addition, 96% of them did not believe that blood tests could diagnose ADHD, and 93.8% of them endorsed multimodal management of ADHD.

The students considered half of the presented ADHD symptoms to be indicative of inattention and the other half to be indicative of hyperactivity–impulsivity [Table 3].

The relationship between the sociodemographic characteristics and ADHD awareness among the medical students has been shown in Table 4.

Table 2: Measures of awareness about ADHD (n=224)

Question	n (%)
A1. Do you know what ADHD stand for?	
Yes*	159 (71.0)
No	65 (29.0)
A2. To suspect ADHD, the patient should have symptoms of ADHD for at least	
1 month	8 (3.6)
2 months	20 (8.9)
6 months*	170 (75.9)
12 months	26 (11.6)
A3. How many subtypes of ADHD do you know?	
1 type	32 (14.3)
2 types	104 (46.4)
3 types*	71 (31.7)
4 types	17 (7.6)
A4. Any child with difficulty in paying attention should be diagnosed with ADHD?	
Yes	12 (5.4)
No*	212 (94.6)
A5. The suspicion of ADHD depends on the history from?	
Parent's only	2 (0.9)
Teacher only	0
Both*	222 (99.1)
A6. What should you do if you suspect ADHD?	
Confirm diagnosis*	66 (29.5)
Refer to specialist	152 (67.9)
Start management	6 (2.7)
A7. Does ADHD affect a child's school performance?	
Yes*	217 (96.9)
No	7 (3.1)
A8. ADHD must be accompanied by other psychiatric or neurologic diseases?	
Yes	50 (22.3)
No*	174 (77.7)
A9. A blood test can diagnose ADHD?	
Yes	9 (4.0)
No*	215 (96.0)
A10. What does the management of ADHD depend on?	
Pharmacological	4 (1.8)
Behavioral	9 (4.0)
Educational	1 (0.40)
Multimodal*	210 (93.8)

*Correct answer. ADHD=Attention deficit hyperactivity disorder

Figure 1 shows the frequencies of medical students who correctly identified the expansion of ADHD—95% (a), 85.5% (d), 95% (h), and 91.2% (d).

Figure 2 depicts the medical students' overall knowledge of ADHD. Specifically, 48.2%, 31.7%, 18.3%, and 1.8% demonstrated fair, poor, very good, and excellent knowledge, respectively.

For the level of awareness (poor vs good), sociodemographic group differences were examined. Good awareness was significantly higher among older students ($P = 0.001$), and poor awareness was more common among fourth-year students and

Table 3: Measures of awareness about the symptoms of ADHD in children (n=224)

Item	Inattention n (%)	Hyperactivity-Impulsivity n (%)
A11. The child fails to give attention to details or makes a careless mistake	210 (93.8)*	14 (6.3)
A12. Often talks excessively	26 (11.6)	198 (88.4)*
A13. Has difficulty sustaining attention to the task	178 (79.5)*	46 (20.5)
A14. Often has difficulty organizing task or activity	145 (64.7)*	79 (35.3)
A15. Often is forgetful in daily activities?	191 (85.3)*	33 (14.7)
A16. Often runs or climbs in a situation where it is inappropriate	31 (13.8)	193 (86.2)*
A17. Often is easily distracted by external stimuli	156 (69.6)*	68 (30.4)
A18. Not seems to listen when spoken to directly	178 (79.5)*	46 (20.5)
A19. Often answers before the question is completed	34 (15.2)	190 (84.8)*
A20. Often acts as if driven by a motor (acting without thought or reason)	50 (22.3)	174 (77.7)*
A21. Often has difficulty waiting in turn	28 (12.5)	196 (87.5)*

*Correct answer. ADHD=Attention deficit hyperactivity disorder

Table 4: Relationship between sociodemographic characteristics and awareness about ADHD (n=224)

Variable	Poor (n=36) n (%)	Good (n=188) n (%)	P
Age group (Years)			
21-23	20 (23.3)	66 (76.7)	0.001*
>23	16 (11.6)	122 (88.4)	
Gender			
Male	17 (12.9)	115 (87.1)	0.119
Female	19 (20.7)	73 (79.3)	
Academic year			
Fourth year	29 (32.6)	60 (67.4)	<0.001*
Fifth year	4 (4.4)	87 (95.6)	
Intern	3 (6.8)	41 (93.2)	
Completed pediatric course			
Yes	3 (2.8)	103 (97.2)	<0.001*
No/Still in course	33 (28.0)	85 (72.0)	
Completed psychiatric course			
Yes	7 (5.1)	129 (94.9)	<0.001*
No	29 (33.0)	59 (67.0)	
Preferred area of specialization			
Neurology	9 (33.3)	18 (66.7)	0.161
Pediatrics	6 (17.1)	29 (82.9)	
Psychiatry	3 (12.5)	21 (87.5)	
Surgery	5 (16.7)	25 (83.3)	
Medicine	3 (8.8)	31 (91.2)	
Other	10 (13.5)	64 (86.5)	
Family history of behavioral disorders			
Yes	1 (5.6)	17 (94.4)	0.205
No	35 (17.0)	171 (83.0)	

*P≤0.05. ADHD=Attention deficit hyperactivity disorder

those who had not completed their pediatric and psychiatric classes ($P < 0.001$). Gender, preferred area of specialization, and family history of behavioral disorders were unrelated to the level of awareness.

Regression analysis was used to predict poor awareness based on sociodemographic characteristics. The OR for poor awareness was lower among older students (>23 years) than among younger students (OR = 0.328, $P = 0.001$) and among fifth-year

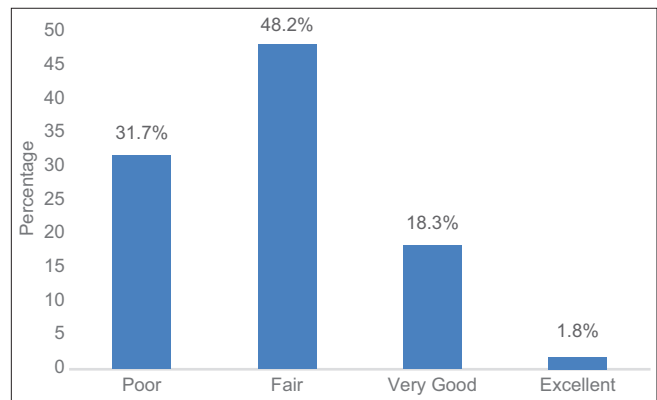


Figure 2: Medical students' knowledge about ADHD

than among fourth-year students (OR = 0.151, $P = 0.003$). The poor awareness of students who had not completed their pediatric (OR = 13.329, $P < 0.001$) and psychiatric courses was predicted to increase significantly (OR = 9.058, $P < 0.001$) [Table 5].

Discussion

The medical students' overall awareness of ADHD was fair. However, their knowledge of diagnosis and the actions to help a child suspected of having ADHD was inadequate. These findings are alarming because these students may be required to diagnose a child with ADHD and initiate necessary actions when they begin their medical practice in a few years. Physicians are also required to educate parents about ADHD. Therefore, medical students must possess adequate knowledge to correctly communicate the etiology and management of the condition. Qashqari *et al.*^[1] also found that the level of knowledge among medical students ($N = 120$) ranged from poor (57%) to fair (32%). However, Al-Ahmari *et al.*^[15] found that the majority of primary health care physicians demonstrated acceptable knowledge with only a quarter of them demonstrating poor knowledge.

In this study, the symptoms most commonly experienced by children that were identified by the medical students were "inattention to details" followed by "often talk excessively," and

Table 5: Predictive relationships between poor awareness and sociodemographic characteristics (n=224)

Variable	OR	95% CI	P
Age group (years)			
21-23	Ref		0.023*
>23	0.433	0.210-0.891	
Academic year			
Fourth year	Ref		
Fifth year	0.151	0.043-0.530	0.003*
Intern	1.591	0.340-7.441	0.555
Completed pediatric course			
Yes	Ref		<0.001*
No/Still in course	13.329	3.950-44.982	
Completed psychiatric course			
Yes	Ref		<0.001*
No	9.058	3.753-21.860	

*P≤0.05. OR=Odds ratio, CI=Confidence interval.

“often has difficulty waiting turn.” “Inattention to task” was also a symptom based on which type of ADHD was diagnosed by the medical students who participated in Qashqari *et al.*'s study.^[1] Symptoms that are exemplified by items like “often runs or climbs in situation where it is inappropriate” and “often easily distracted by external stimuli” were also common. This concurs with Al-Ahmari *et al.*'s^[15] finding that the most common symptoms of ADHD are “difficulty in waiting turn,” “difficulty organizing tasks, activities and belongings,” and “easily distracted by irrelevant stimuli.”

Furthermore, medical students reported that they would refer a child suspected of having ADHD to a specialist for confirmation of the diagnosis. In Qashqari *et al.*'s^[1] study, more than half of the medical students were unaware of the necessary initial steps in such a case. The results of this study concur with that of the abovementioned authors that primary health care physicians refer patients with ADHD symptoms to specialists.^[15]

Education about and experience with ADHD allows one to take the initial step toward the diagnosis of a child suspected of having ADHD. In this study, 47% and 60.7% of the medical students had attended the pediatric class and enrolled in a psychiatric course, respectively. In a previous study, which was conducted among medical students at King Abdul-Aziz University, completion of the pediatric and psychiatric courses were 62% and 87%, respectively.^[1] However, in Asir, primary health care physicians were not receptive to the continuation of ADHD education, with only 13.2% of them have previously enrolled in a course about ADHD.^[15] This may be attributable to their busy schedules, as indeed, their medical practice places great demands on their time.

Limitations of the study

This study has certain limitations. First, because of the use of self-reported questionnaires, which entail self-report bias, the generalizability of the overall findings is limited. Second, because of the cross-sectional design of the study, nonresponses may have biased the emergent results. Lastly, the study only represents one university.

Conclusion

Medical students had a good awareness of ADHD; however, they had insufficient knowledge. As such, their knowledge must be improved, which can be achieved through the promotion of continuous education of students and primary health care physicians. The inclusion of the topic of ADHD in pediatric and psychiatric courses is necessary for advancing the knowledge of medical students on ADHD.

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Conflicts of interest

There are no conflicts of interest.

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