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KNOWLEDGE AND ATTITUDE OF ELEMENTARY SCHOOL TEACHERS TOWARDS ADHD IN THE KINGDOM OF SAUDI ARABIA

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Abstract

Background: ADHD is typically affecting school performance, concentration, and self-control at school. Teachers are often the first ones to suspect ADHD in their students, because they are with them for most of the day and they know how normal students typically behave in classroom situations.

Objectives: The aim of this study is to measure the knowledge level and to assess the attitude toward attention-deficit hyperactivity-disorder (ADHD) among elementary school teachers in Saudi Arabia.

Methodology: A cross-sectional study based on a structured questionnaire that was conducted on primary school teachers in Saudi Arabia during 2023-2024. The questionnaire contains 51 questions and is divided into three main parts. The first part is concerned with the social and personal data and contains 15 questions. The second part is composed of 24 questions and is focusing on the level of knowledge which might be high, moderate or low according to the score. The last part is to check the attitudes and contains 12 questions and according to the score the participant might have positive, fair or negative attitude. By using the following formula, $n = (z)^2 p (1 - p) / d^2$ the sample size is planned to be 384. SPSS (Statistical-Package of Social -Science) version 20 will be used to analyze the data. And the data will be written by using "Microsoft Office Excel Software".

Result: The present study demonstrates a low level of knowledge among teachers regarding ADHD: about 94% had low level of knowledge. A positive association was found between knowledge level and the teachers' age, previous experience with ADHD and nationality (p value < 0.05). As regard attitude 96% demonstrated a positive attitude towards ADHD.

Conclusion: there is a low level of knowledge among teachers regarding ADHD, about 94% had low

level of knowledge while a significant majority of 96% demonstrated a positive attitude towards ADHD. Elementary school teachers should be trained in identifying ADHD symptoms as well as in behavioral management and academic interventions.

Keywords: Attention deficit hyperactivity disorder, ADHD, Elementary School Teachers, Knowledge, Attitude

Introduction:

Attention deficit hyperactivity disorder (ADHD) is a mental neurodevelopment condition depicting hyperactivity, lack of attention, and impulsivity [1]. It has 3 main types: Inattentive type has more symptoms of inattention than those of impulsivity and hyperactivity [2]. Whereas, Hyperactive-impulsive type manifests symptoms of impulsivity and hyperactivity while the combined type is a blend of symptoms that don't exclusively fall within these two types above [2]. It is known that (ADHD) is a multifactorial condition that is caused by the interaction of genetic makeup, environmental, psychological, and contextual factors, despite the fact that the etiology is not fully understood [3]. For example, some genetic syndromes are highly prone to have (ADHD) such as kids with Klinefelter's, Turner's, fragile-X, or neurofibromatosis type I [1]. (ADHD) is commonly diagnosed up to the age of 12, and a diagnosis requires that symptoms appear in more than one setting and impairment in productivity in the workplace, in social settings, or in school [4]. In that case, the role of teachers is vital as they regularly interact with kids and are capable of noticing traits and symptoms that could be indicative of (ADHD) which leads them to refer those kids for expert assessment [4]. Therefore, teachers should be knowledgeable enough about ADHD to fully comprehend the disease, reduce their anxiety in the teaching environment, and have a positive attitude toward kids with (ADHD) [5]. It was discovered that the prevalence of ADHD is as high as 5.1% to 14.9% among school-aged kids in Arab countries, such as Egypt, KSA, Palestine, Oman, Qatar, and (UAE) [6]. According to estimates from Polinczyk et al. (2007), 2.8% of adults worldwide have ADHD, with prevalence rates in childhood and adolescence ranging from 3.4% to 4.3% [7]. Even more recently, a meta-analysis of 175 studies concluded that 7.2% of kids and youths all over the world have ADHD [6]. Additionally, according to the American Academy of Pediatrics, 9% of schoolchildren suffer from ADHD [8]. Also, on Neurobiological (Motavalli-Mukaddes, 2015) and developmental illnesses (MEB, 2017) have been classified as ADHD, even though diagnosis occurs at a rate of 5-7% in society [7]. Statistics have found that Boys are more likely to be affected by these rates, which range from 1% to 20%, than girls [9]. In 2021, A study in Albaha region with a sample size of 361 teachers in 82 primary schools and kindergartens discovered that 218 of them (60.3%) had no guidelines on ADHD during their teaching training [10]. In a separate study, 264 primary school teachers from the public and private sectors of Sharjah, UAE, participated. The results showed that the majority of teachers (56.3%) are aware of the signs and symptoms of ADHD. Teachers also understand 34.4% and 34.1%, respectively, of the associated characteristics and treatments of ADHD [11]. according to a study involving 417 teachers in primary schools in Ethiopia, the mean score for the teachers' attitude toward ADHD, was 41.6 ± 5.4 (95% CI; 41.12, 42.16). In addition, 46% of participants had negative attitudes [12].

Insufficient knowledge about ADHD among school teachers, small sample sizes in previous research, and the use of self-reported questionnaires, which introduced bias and recall, necessitated the present study to assess teachers' knowledge regarding ADHD. It is essential to spread knowledge about ADHD since doing so makes it easier to identify and treat this neurodevelopmental condition at an early stage. Many individuals with ADHD often face misdiagnosis with other mental health conditions, such as anxiety and depression, or endure years without an official diagnosis.

Objectives:

The Main objective of conducting this study is to measure the knowledge level and to assess the attitude towards attention-deficit hyperactivity-disorder (ADHD) among elementary school teachers in the Kingdom of Saudi Arabia.

Materials and Methods:

Study design:

Cross-sectional study based on a structured questionnaire that was conducted on primary school teachers in Saudi Arabia during 2023-2024.

Study setting: Participants, recruitment, and sampling procedure:

The study's population consisted of school teachers from all elementary schools in Saudi Arabia. Both males and females' teachers participated in our study. A descriptive study that was carried out at various selected primary schools in different regions in KSA to assess the teachers' knowledge level and attitude toward attention-deficit hyperactivity disorder.

Inclusion and Exclusion criteria:

The study included all male and female primary school teachers who are present throughout the data collecting period and working in the chosen public and private primary school in Saudi Arabia. Teachers who do not speak Arabic were eliminated from the study. Teachers who participated in the pilot study were eliminated as well.

Sample size:

Regarding the sample size calculation in this study, the following formula is used to calculate and determine the appropriate sample size.

$$n = (z)^2 p (1 - p) / d^2$$

n = sample size.

z = Confidence level which is 1.96.

p = Expected prevalence, which is 50%.

d = Absolute error, which is 5%

The sample size is 384.

Method for data collection and instrument (*Data collection Technique and tools*):

The collection of data from participants was done via an online questionnaire. All participants were

informed about the aim of our study and the consent were taken. The survey includes 52 questions divided into four parts, the first part includes the social statement and the level of education, the second and the third parts focus on the general information and knowledge of the teachers regarding ADHD and the Knowledge of the teachers regarding ADHD symptoms and diagnosis and they were used by a previously published study [13]. The last part is concerned with the attitude toward attention-deficit and hyperactivity disorder which was inspired by [14].

Scoring system:

The scoring scale of the level of knowledge depended on the following two sections, Knowledge of the teachers regarding ADHD general information, knowledge of the teachers regarding ADHD symptoms and diagnosis. There were two types of questions, Questions had (true, false, Don't Know) options were scored as the following, one point for correct answer, and zero for wrong answers and participants who answered (Don't Know). Total questions were 24 questions with total points (24 points). Participants who answered correctly 80% of questions (19 questions) and more have a high level of knowledge regarding ADHD. Participants who answered correctly 79%-60% of questions (15-18 questions) have a moderate level of knowledge regarding ADHD. Participants who answered correctly 59% of questions (14 questions) and less have a low level of knowledge regarding ADHD.

The other type of questions were regarding the attitude toward attention-deficit and hyperactivity disorder. In these questions we used a 5-scale Likert scale (agree, strongly agree, neutral, disagree, and strongly disagree). 12 questions, with a maximum score of 60 and a minimum score of 12. Participants who answered strongly agree have got 5 points per question. Participants who answered strongly disagree have got the lowest score which is 1 point per question. Participants who score more than 36 points have a positive attitude toward attention-deficit and hyperactivity disorder. Participants who score 36 points have fair attitude toward attention-deficit and hyperactivity disorder. Participants who score less than 36 and more than 12 points have negative attitude toward attention-deficit and hyperactivity disorder.

Analyzes and entry method:

Any survey was reviewed for completion after data collection before data entry, SPSS (Statistical-Package of Social -Science) version 20 was used to analyze the data. And the data had been written by using "Microsoft Office Excel Software"

Results:

The table (1) presents a comprehensive overview of the participants, with a total of 411 individuals included in the study. The data reveals interesting patterns in terms of age distribution, with the majority of participants falling within the 40-50 years old category (59.1%), followed by those below 40 years old (23.1%) and those above 50 years old (17.8%). In terms of gender, the sample is predominantly female, comprising 70.8% of the participants, while males account for 29.2%. Education level varies among the participants, with a significant proportion holding a Bachelor's degree (72.3%), followed by those with a Diploma (11.9%) and Master's degree (7.5%). Only a small percentage reported having a Post-graduate Doctorate (PHD) at 0.5%. The distribution of participants across different regions of

Saudi Arabia is also noteworthy, with the Western Province having the highest representation at 47.2%, followed by the Central Province (19.7%), Eastern Province (19.2%), Southern Province (11.7%), and Northern Province (2.2%). The vast majority of participants are Saudi nationals (99.0%), with only a small percentage being non-Saudi (1.0%). In terms of marital status, the majority of participants are married (87.6%), followed by singles (7.3%), separated individuals (3.2%), and widowed individuals (1.9%). The number of children also varies among the participants, with 62.3% reporting having 3-6 children, 30.9% having less than 3 children, and 6.8% having more than 6 children. The teaching experience of the participants is diverse, with the majority having above 11 years of experience (64.5%), followed by those with 7-10 years (11.4%), less than 3 years (16.1%), and 4-6 years (8.0%). The data also sheds light on the participants' knowledge and experience with ADHD, with a significant proportion indicating familiarity with the disorder (88.8%) and having taught children with ADHD (37.0%). The main sources of knowledge on ADHD include social media (53.68%), friends and relatives (29.47%), TV and radio (26.05%), educational workshops (20%), scientific journals (14.74%), and campaigns (22.37%). Moreover, a considerable number of participants reported knowing individuals with ADHD outside of their work environment (53.3%) and emphasized the importance of understanding ADHD, with the majority considering it either important (42.6%) or very important (44.8%). Participants also rated their knowledge about ADHD and their capacity to teach children with ADHD, with responses ranging from very poor to excellent and from 1 (not prepared) to 10 (totally prepared), respectively.

Table (1): Sociodemographic characteristics of participants (n=411)

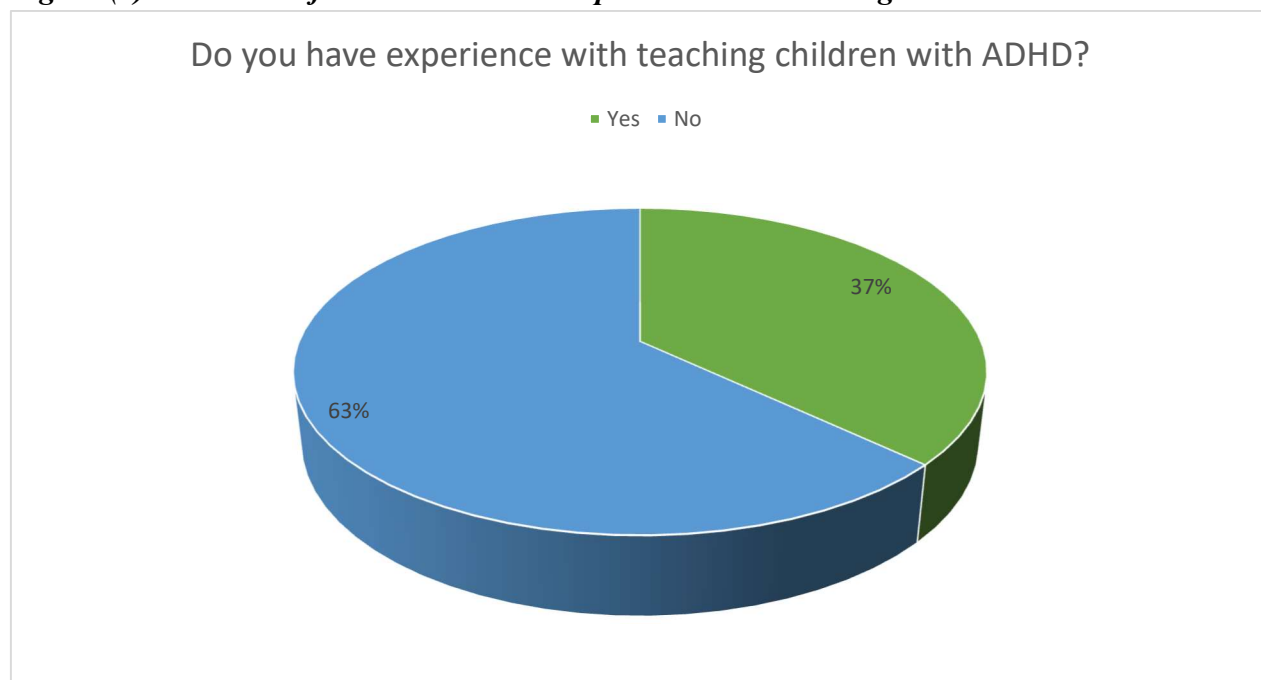
Parameter		No.	Percent (%)
Age	Less than 40	95	23.1
	40 – 50	243	59.1
	More than 50	73	17.8
Gender	Male	120	29.2
	Female	291	70.8
Education level	Below high school	32	7.8
	Bachelor degree	297	72.3
	Diploma	49	11.9
	Master's	31	7.5
	Post-graduate Doctorate (PHD)	2	.5
Region	Northern Province	9	2.2
	Southern Province	48	11.7
	Central Province	81	19.7
	Eastern Province	79	19.2
	Western Province	194	47.2
Nationality	Saudi	407	99.0
	Non-Saudi	4	1.0

Marital Status	Single	30	7.3
	Married	360	87.6
	Separated	13	3.2
	Widowed	8	1.9
Number of children	Less than 3 children	127	30.9
	3 – 6 children	256	62.3
	More than 6 children	28	6.8
Teaching experience in years	Less than 3 years	66	16.1
	4 – 6 years	33	8.0
	7 – 10 years	47	11.4
	Above 11 years	265	64.5
Knowing what ADHD (Attention Deficit Hyperactivity Disorder) is	Yes	365	88.8
	No	46	11.2
(n=380) If yes, the source of knowledge **	TV and Radio	99	26.05
	Friends and relatives	112	29.47
	Campaigns	85	22.37
	Social media	204	53.68
	Scientific journals	56	14.74
	Educational workshops	76	20
Having experience with teaching children with ADHD	Yes	152	37.0
	No	259	63.0
(n=200) If yes, number of children taught throughout teacher's career	Less than 5 children	119	59.5
	6 – 10 children	50	25
	11 and above children	31	15.5
knowing anyone with ADHD outside of his work environment	Yes	219	53.3
	No	192	46.7
Importance of knowing about ADHD	Not at all important	11	2.7
	Low Importance	10	2.4
	Neutral	31	7.5
	Important	175	42.6
	Very Important	184	44.8
Degree of knowledge about ADHD	Very poor	19	4.6
	Poor	57	13.9
	Average	244	59.4
	Very good	76	18.5
	Excellent	15	3.6
Capacity to teach children with ADHD <i>(where 1 is not prepared up to 10 which is totally prepared)</i>	1	96	23.4
	2	44	10.7
	3	43	10.5
	4	44	10.7

	5	80	19.5
	6	31	7.5
	7	22	5.4
	8	27	6.6
	9	14	3.4
	10	10	2.4

**** Results may overlap**

Figure (1): illustrates if the teachers have experience with teaching children with ADHD



As illustrated in table (2), The table outlines various parameters related to the teachers' understanding of ADHD, with a sample size of 411 participants. It is evident from the data that there are varying levels of awareness and misconceptions among teachers regarding ADHD. For instance, a significant proportion of teachers correctly believe that children with ADHD may exhibit distinguishable behaviours in a classroom setting compared to free play situations. However, there are also misconceptions, such as the belief that ADHD children often outgrow their symptoms by puberty. This highlights the importance of providing accurate information and training to educators to effectively support students with ADHD. Moreover, the data indicates a need for further education on ADHD symptoms and diagnosis, as some teachers may not accurately recognize key behavioural indicators, such as difficulties in organizing tasks and activities or being frequently distracted by external stimuli. Overall, this data underscores the significance of enhancing teachers' knowledge and attitudes towards ADHD to create a more inclusive and supportive learning environment for students with ADHD in Saudi Arabia.

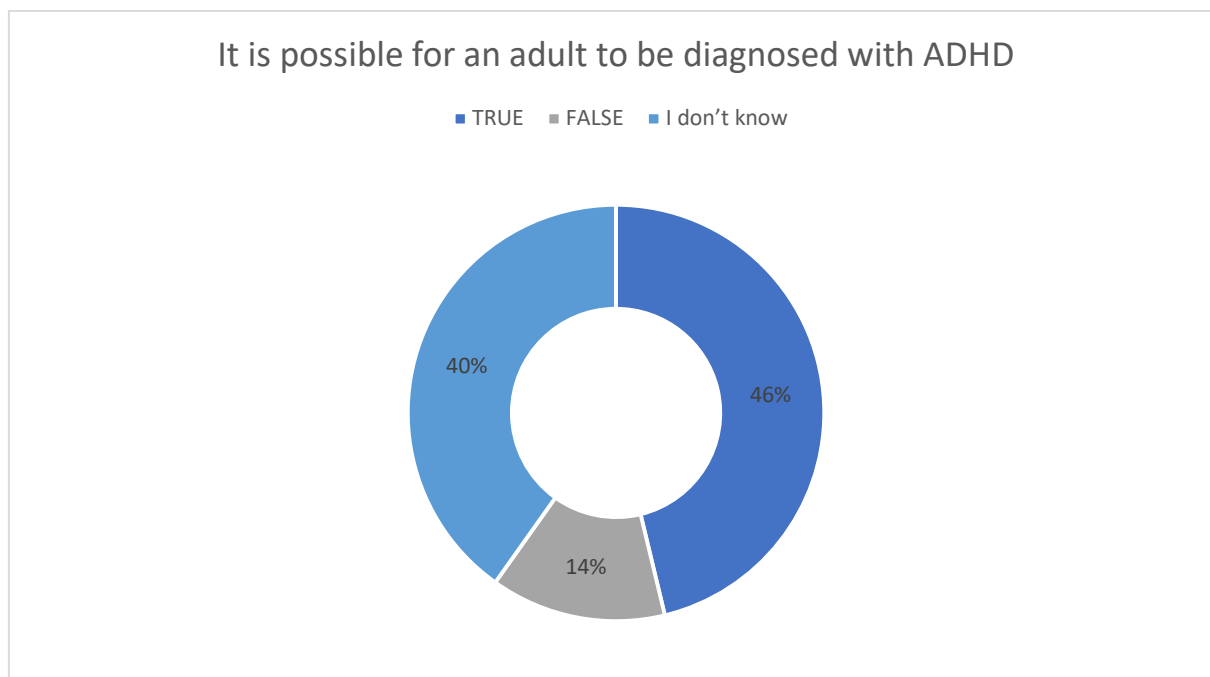
Table (2): Parameters related to Knowledge of the teachers regarding ADHD (n=411).

Parameter	No.	Percent (%)
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Children with ADHD are more distinguishable from normal children in a classroom setting than in a free play situation.	True	353	85.9
	False	13	3.2
	I don't know	45	10.9
Symptoms of ADHD are often seen in non-ADHD children who come from inadequate and chaotic home environments.	True	186	45.3
	False	56	13.6
	I don't know	169	41.1
It is possible for an adult to be diagnosed with ADHD.	True	190	46.2
	False	56	13.6
	I don't know	165	40.1
The majority of ADHD children evidence some degree of poor school performance in the elementary school years.	True	263	64.0
	False	70	17.0
	I don't know	78	19.0
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.	True	181	44.0
	False	117	28.5
	I don't know	113	27.5
Most ADHD children "outgrow" their symptoms by the onset of puberty and subsequently function normally in adulthood.	True	162	39.4
	False	60	14.6
	I don't know	189	46.0
In school age children, the prevalence of ADHD in males and females is equivalent.	True	110	26.8
	False	115	28.0
	I don't know	186	45.3
Symptoms of depression are found more frequently in ADHD children than in non-ADHD children.	True	159	38.7
	False	64	15.6
	I don't know	188	45.7
There are specific physical features which can be identified by medical doctors (e.g. paediatrician) in making a definitive diagnosis of ADHD.	True	187	45.5
	False	69	16.8
	I don't know	155	37.7
ADHD is more common in the 1st degree biological relatives (i.e. mother, father) of children with ADHD than in the general population.	True	147	35.8
	False	58	14.1
	I don't know	206	50.1
A diagnosis of ADHD by itself makes a child eligible for placement in special education.	True	260	63.3
	False	45	10.9
	I don't know	106	25.8
In very young children (less than 4 years old), the problem behaviours of ADHD children (e.g. hyperactivity, inattention) are distinctly different from age-appropriate behaviours of non-ADHD children.	True	276	67.2
	False	19	4.6
	I don't know	116	28.2
ADHD children are typically more compliant with their fathers than with their mothers.	True	116	28.2
	False	110	26.8

	I don't know	185	45.0
Most estimates suggest that ADHD occurs in approximately 15% of school age children.	True	165	40.1
	False	40	9.7
	I don't know	206	50.1
ADHD children generally experience more problems in novel situations than in familiar situations.	True	275	66.9
	False	12	2.9
	I don't know	124	30.2
Knowledge of the teachers regarding ADHD symptoms and diagnosis			
ADHD children often fidget or squirm in their seats.	True	360	87.6
	False	10	2.4
	I don't know	41	10.0
ADHD children often have difficulties organizing tasks and activities.	True	314	76.4
	False	30	7.3
	I don't know	67	16.3
ADHD children are frequently distracted by extraneous stimuli.	True	328	79.8
	False	22	5.4
	I don't know	61	14.8
Current wisdom about ADHD suggests two clusters of symptoms: One of inattention and another consisting of hyperactivity/impulsivity.	True	271	65.9
	False	18	4.4
	I don't know	122	29.7
In order to be diagnosed as ADHD, a child must exhibit relevant symptoms in two or more settings (e.g. home, school).	True	299	72.7
	False	20	4.9
	I don't know	92	22.4
One symptom of ADHD children is that they have been physically mean to other people.	True	181	44.0
	False	98	23.8
	I don't know	132	32.1
It is common for ADHD children to have an inflated sense of self-esteem.	True	132	32.1
	False	63	15.3
	I don't know	216	52.6
ADHD children often have a history of stealing or destroying other people's things.	True	122	29.7
	False	88	21.4
	I don't know	201	48.9

Figure (2): illustrates if the teachers think that it is possible for an adult to be diagnosed with ADHD among participants



In table (3) The findings reveal that a significant percentage of teachers strongly agree (45.0%) and agree (45.7%) that training teachers in behavioral management is crucial. Moreover, a majority of participants strongly agree (57.2%) and agree (36.0%) that improving parents' skills would benefit children with ADHD. The data also indicates strong support for treating ADHD children if recommended by a doctor, with 57.9% strongly agreeing and 34.3% agreeing. Additionally, there is a positive attitude towards social skill training for children with ADHD, as evidenced by 45.7% strongly agreeing and 46.2% agreeing. The results suggest a recognition of the importance of clear and consistent rules in treating ADHD, with 43.1% agreeing and 36.5% neutral on this parameter. Interestingly, there is a varied perspective on the potential causes of ADHD, with differing opinions on whether it results from the child's behavior, parental inconsistency, or family problems. Furthermore, a substantial proportion of participants express a desire to learn specialized teaching techniques for treating ADHD children (29.9% strongly agree, 50.1% agree). Overall, the data provides valuable insights into the knowledge and attitudes of elementary school teachers in Saudi Arabia towards ADHD, highlighting areas of consensus and divergence that could inform future interventions and support strategies for children with ADHD.

Table (3): participants Attitude toward attention deficit and hyperactivity disorder (Likert scale) (n=411).

Parameter	No.	Percent (%)
Training teachers in behavioral management is important	Strongly agree	185 45.0
	Agree	188 45.7
	Neutral	25 6.1
	Disagree	5 1.2
	Strongly disagree	8 1.9

Improving the parents' skill would benefit their children	Strongly agree	235	57.2
	Agree	148	36.0
	Neutral	17	4.1
	Disagree	5	1.2
	Strongly disagree	6	1.5
ADHD child should be treated if recommended by a doctor	Strongly agree	238	57.9
	Agree	141	34.3
	Neutral	19	4.6
	Disagree	5	1.2
	Strongly disagree	8	1.9
Social skill training can be helpful for a child with ADHD	Strongly agree	188	45.7
	Agree	190	46.2
	Neutral	24	5.8
	Disagree	4	1.0
	Strongly disagree	5	1.2
Behavioural management is an effective treatment	Strongly agree	170	41.4
	Agree	187	45.5
	Neutral	41	10.0
	Disagree	6	1.5
	Strongly disagree	7	1.7
Side effects of stimulant drugs used for treatment of ADHD may include mild insomnia and appetite reduction.	Strongly agree	53	12.9
	Agree	135	32.8
	Neutral	191	46.5
	Disagree	19	4.6
	Strongly disagree	13	3.2
Clear consistent rules and consequences are helpful in treating ADHD	Strongly agree	51	12.4
	Agree	177	43.1
	Neutral	150	36.5
	Disagree	24	5.8
	Strongly disagree	9	2.2
ADHD can be the result of the child not trying to control his/her behaviour	Strongly agree	45	10.9
	Agree	215	52.3
	Neutral	107	26.0
	Disagree	35	8.5

	Strongly disagree	9	2.2
ADHD results from parents being inconsistent with rules and consequences	Strongly agree	47	11.4
	Agree	164	39.9
	Neutral	141	34.3
	Disagree	50	12.2
	Strongly disagree	9	2.2
Family problems may contribute to a child's ADHD	Strongly agree	74	18.0
	Agree	189	46.0
	Neutral	104	25.3
	Disagree	32	7.8
	Strongly disagree	12	2.9
I want to learn specialized teaching techniques to treat an ADHD child	Strongly agree	123	29.9
	Agree	206	50.1
	Neutral	65	15.8
	Disagree	8	1.9
	Strongly disagree	9	2.2
Children develop ADHD need attention	Strongly agree	213	51.8
	Agree	160	38.9
	Neutral	29	7.1
	Disagree	5	1.2
	Strongly disagree	4	1.0

Table (4) reveal that the knowledge of elementary school teachers towards Attention Deficit Hyperactivity Disorder (ADHD) in the Kingdom of Saudi Arabia is quite revealing. The majority of teachers, constituting 93.9% of the sample, were found to have a low level of knowledge about ADHD. This could have significant implications for the identification and support of students with ADHD in the classroom setting. It is concerning to note that none of the teachers surveyed demonstrated a high level of knowledge about ADHD, which suggests a potential gap in teacher training or professional development in this area. The small percentage (6.1%) of teachers with a moderate level of knowledge indicates that there is some awareness among a minority of educators, but there is still a clear need for improvement.

Table (4): Shows Knowledge of the teachers regarding ADHD score results.

	Frequency	Percent
Low level of knowledge	386	93.9
Moderate level of knowledge	25	6.1
High level of knowledge	0	0
Total	411	100.0

The data provided in Table 5, which showcases the attitude towards ADHD on a Likert scale, is particularly illuminating. The table reveals that out of a total of 411 participants, 1.7% exhibited a fair attitude towards ADHD, while 2.4% displayed a negative attitude. In contrast, a significant majority of 95.9% demonstrated a positive attitude towards ADHD. These findings indicate a generally positive disposition among elementary school teachers in Saudi Arabia towards ADHD, which is crucial for fostering a supportive and inclusive learning environment for students with ADHD. The high percentage of positive attitudes suggests a level of awareness, understanding, and acceptance of ADHD within the educational community, which bodes well for the effective management and support of students with the disorder.

Table (5): Shows Attitude toward attention deficit and hyperactivity disorder (Likert scale) score results.

	Frequency	Percent
Fair attitude	7	1.7
Negative attitude	10	2.4
Positive attitude	394	95.9
Total	411	100.0

Table (6) shows that knowledge of the teachers regarding ADHD is statistically significant related to gender (p value=0.033), age (p value=0.047), nationality (p value=0.0001), whether the teacher has experience with teaching children with ADHD (p value=0.014), whether the teacher know anyone with ADHD outside of his work environment (p value=0.019). It also shows statistically insignificant relation to region and teaching experience (in years).

Table (6): Relation between knowledge of the teachers regarding ADHD and sociodemographic data.

		Knowledge level		Total (N=411)	P value*
		Low	Moderate or high		
Gender	Male	108	12	120	0.033
		28.0%	48.0%	29.2%	
	Female	278	13	291	
		72.0%	52.0%	70.8%	
Age	Less than 40 year old	91	4	95	0.047
		23.6%	16.0%	23.1%	

	40 – 50 year old	231 59.8%	12 48.0%	243 59.1%			
	More than 50 year old	64 16.6%	9 36.0%	73 17.8%			
Nationality	Saudi	384 99.5%	23 92.0%	407 99.0%	0.0001		
		2 0.5%	2 8.0%	4 1.0%			
	Non-Saudi	7 1.8%	2 8.0%	9 2.2%		0.261	
		46 11.9%	2 8.0%	48 11.7%			
Central Province	76 19.7%	5 20.0%	81 19.7%				
	Eastern Province	76 19.7%	3 12.0%	79 19.2%			
Western Province	181 46.9%	13 52.0%	194 47.2%				
	Below high school	32 8.3%	0 0.0%	32 7.8%	N/A		
Bachler degree	280 72.5%	17 68.0%	297 72.3%				
	Diploma	45 11.7%	4 16.0%	49 11.9%			
Master's		27 7.0%	4 16.0%	31 7.5%			
	Post-graduate Doctorate (PHD)	2 0.5%	0 0.0%	2 0.5%			
Marital status		Single	30 7.8%	0 0.0%		30 7.3%	N/A
	338 87.6%		22 88.0%	360 87.6%			
	Separated	10 2.6%	3 12.0%	13 3.2%			
		Widowed	8 2.1%	0 0.0%	8 1.9%		
	Teaching experience in years	Less than 3 years	65 16.8%	1 4.0%	66 16.1%	0.372	
			4 – 6 years	31	2		

		8.0%	8.0%	8.0%	
	7 – 10 years	43	4	47	
		11.1%	16.0%	11.4%	
	Above 11 years	247	18	265	
		64.0%	72.0%	64.5%	
Having experience with teaching children with ADHD	Yes	137	15	152	0.014
		35.5%	60.0%	37.0%	
	No	249	10	259	
		64.5%	40.0%	63.0%	
Knowing anyone with ADHD outside of your work environment	Yes	200	19	219	0.019
		51.8%	76.0%	53.3%	
	No	186	6	192	
		48.2%	24.0%	46.7%	

**P value was considered significant if ≤ 0.05 .*

Table (7) shows that attitude of the teachers regarding ADHD is statistically significant related to whether the teacher knows anyone with ADHD outside of his work environment (p value=0.044). It also shows statistically insignificant relation to gender, age, whether the teacher has experience with teaching children with ADHD and region.

Table (7): Relation between attitude of the teachers regarding ADHD and sociodemographic data.

		Attitude		Total (N=411)	P value*
		Fair or Negative	Positive		
Gender	Male	7	113	120	0.267
		41.2%	28.7%	29.2%	
	Female	10	281	291	
		58.8%	71.3%	70.8%	
Age	Less than 40 year old	3	92	95	0.281
		17.6%	23.4%	23.1%	
	40 – 50 year old	13	230	243	
		76.5%	58.4%	59.1%	
	More than 50 year old	1	72	73	
		5.9%	18.3%	17.8%	
Nationality	Saudi	17	390	407	N/A
		100.0%	99.0%	99.0%	
	Non-Saudi	0	4	4	
		0.0%	1.0%	1.0%	
Region	Northen Province	0	9	9	N/A
		0.0%	2.3%	2.2%	

	Southern Province	0 0.0%	48 12.2%	48 11.7%		
	Central Province	5 29.4%	76 19.3%	81 19.7%		
	Eastern Province	4 23.5%	75 19.0%	79 19.2%		
	Western Province	8 47.1%	186 47.2%	194 47.2%		
Education level	Below high school	2 11.8%	30 7.6%	32 7.8%	N/A	
	Bachelor degree	13 76.5%	284 72.1%	297 72.3%		
	Diploma	1 5.9%	48 12.2%	49 11.9%		
	Master's	1 5.9%	30 7.6%	31 7.5%		
	Post-graduate	0 0.0%	2 0.5%	2 0.5%		
	Doctorate (PHD)	0 0.0%	2 0.5%	2 0.5%		
Marital status	Single	2 11.8%	28 7.1%	30 7.3%	N/A	
	Married	15 88.2%	345 87.6%	360 87.6%		
	Separated	0 0.0%	13 3.3%	13 3.2%		
	Widowed	0 0.0%	8 2.0%	8 1.9%		
Teaching experience in years	Less than 3 years	4 23.5%	62 15.7%	66 16.1%	N/A	
	4 – 6 years	0 0.0%	33 8.4%	33 8.0%		
	7 – 10 years	0 0.0%	47 11.9%	47 11.4%		
	Above 11 years	13 76.5%	252 64.0%	265 64.5%		
Having experience with teaching children with ADHD	Yes	5 29.4%	147 37.3%	152 37.0%	0.509	
		12 70.6%	247 62.7%	259 63.0%		
	No	5 29.4%	147 37.3%	152 37.0%		
		12 70.6%	247 62.7%	259 63.0%		
	Yes	5	214	219	0.044	

Knowing anyone with ADHD outside of your work environment		29.4%	54.3%	53.3%	
	No	12	180	192	
		70.6%	45.7%	46.7%	

**P value was considered significant if ≤ 0.05 .*

Discussion:

Attention deficit/hyperactivity disorder (ADHD) is one of the most common psychiatric illness that affect school age children worldwide [15]. (ADHD) is basically an impairment in functioning in at least two settings, usually home and school due to impulsivity, inattention, or hyperactivity [16,17]. There are three major types of ADHD; the combined type, which is the most common, patients with this problem have difficulty with attention and focus, and have some hyperactive or impulsive behavior. The second type is the inattentive type, the patients may have difficulty with attention, but there is no significant hyperactive or impulsive behaviors,[18] and then the hyperactive-impulsive type, which is less common, there are less problems with attention, and it is more common maybe in preschoolers where they mostly have the hyperactive component [19,20,21]. There seems to be some genetic predisposition to this problem, boys are much more likely than girls to get the problem, a child of a parent with ADHD has a 25% chance of developing ADHD themselves. The diagnosis of ADHD, according to these collaborative guidelines, should be based on a synthesis of information obtained from parents, school reports, and any health-care professionals who may have been consulted, as well as an interview and examination of the child [22]. Teachers are typically the ones who perform referrals during the initial stages of ADHD-related assessment, and these referrals have been identified as predictors of a child's symptoms [23]. Previous Saudi studies highlighted the importance of integrating the ADHD knowledge improvement program into teachers educational and training programs. In addition to continuous assessment of their knowledge of ADHD. This approach can lead to better understanding and management of ADHD in the school, ultimately improving academic outcomes for students with ADHD. Thus we aim in this study to measure the knowledge level and to assess the attitude toward attention-deficit hyperactivity-disorder (ADHD) among elementary school teachers in Saudi Arabia to increase awareness about this condition among teachers and students.

As regard Knowledge score of the teachers towards ADHD, we have found 93.9% of the sample, were found to have a low level of knowledge about ADHD. This could have significant implications for the identification and support of students with ADHD in the classroom setting. It is concerning to note that none of the teachers surveyed demonstrated a high level of knowledge about ADHD, which suggests a potential gap in teacher training or professional development in this area. The small percentage (6.1%) of teachers with a moderate level of knowledge indicates that there is some awareness among a minority of educators, but there is still a clear need for improvement. There are also varying levels of awareness and misconceptions among teachers regarding ADHD. On the other hand, Alanazi *et al.* [24] discovered that only 8% of teachers in Riyadh had never heard of ADHD, while 78% had read about it at least once. Their average level of ADHD knowledge, on the other hand, was high (at least 90% of their answers were correct). Other findings from similar studies conducted in Saudi Arabia [25,26] and around the world indicate that teachers are unaware of ADHD symptoms. Another study in Makkah discovered that 58.9% of elementary and kindergarten teachers answered ADHD questions correctly

[27,28]. Another study conducted in Riyadh discovered the percentage of overall correct answers to be 17.2% [29]. Moreover, Al-Moghamsi *et al.*[30] conducted another study on elementary schoolteachers to assess their knowledge of ADHD in Al-Madina, Saudi Arabia, 2017. The study also revealed a lack of knowledge about ADHD, particularly when it came to its treatment. Teachers also held some common misconceptions about the causes, symptoms, diagnosis, and management of ADHD. In addition, a study conducted in Ethiopia by Dessie *et al.* [31] revealed that only a few primary schoolteachers had a comprehensive understanding of ADHD. Furthermore, Guerra *et al.* [32] conducted research in Texas and discovered that teachers lacked knowledge on the causes, nature, and outcomes of ADHD. While they did have some knowledge about the signs and diagnosis of ADHD, they may have had difficulty recognizing such signs in a specific child. Consistently, Alkahtani [33] discovered that nearly one-fifth of the teachers in their study responded correctly to general knowledge items, while roughly one-fourth responded incorrectly. Only a small percentage (18.1%) of teachers correctly answered symptoms and diagnosis, whereas more than one-fifth answered items incorrectly. As regard attitude score towards ADHD, we have found 1.7% exhibited a fair attitude towards ADHD, while 2.4% displayed a negative attitude. In contrast, a significant majority of 95.9% demonstrated a positive attitude towards ADHD. The high percentage of positive attitudes suggests a level of awareness, understanding, and acceptance of ADHD within the educational community, which bodes well for the effective management and support of students with the disorder. On the other hand, Dessie *et al.* (2021), [34] revealed that 84.1% of teachers held favorable attitudes toward ADHD and that the likelihood of reporting favorable attitudes were 1.85 times higher when the teachers had previous experience teaching a child with ADHD which is relatively lower than ours. Moreover, a study conducted by Haile Amha *et al.*, [35] revealed that the mean score of teachers' attitude toward ADHD was 41.6 ± 5.4 (95% CI; 41.12, 42.16) as measured by the ADHD belief scale that ranges from 12 to 60. Less than half of the respondents 192 (46%) scored below the mean score (had unfavorable attitude). Consistently, a study conducted by Sarah Mulholland *et al.*, 2023, [36] revealed that teachers had generally positive attitudes towards students who display ADHD-type behaviours, however, they found the externalised behaviours of ADHD irritating in the classroom and found teaching students with ADHD-type behaviours difficult, and teachers want more information about ADHD and how to manage it in the classroom.

Conclusion:

The present study demonstrates a low level of knowledge among teachers regarding ADHD: about 94% had low level of knowledge. A positive association was found between knowledge level and the teachers' age, previous experience with ADHD and nationality, as a significantly higher percentage of younger teachers were more knowledgeable about ADHD and teachers with previous experience with ADHD child were more knowledgeable too. As regard attitude score towards ADHD, 1.7% exhibited a fair attitude towards ADHD, while 2.4% displayed a negative attitude. In contrast, a significant majority of 96% demonstrated a positive attitude towards ADHD. The high percentage of positive attitudes suggests a level of awareness and acceptance of ADHD within the educational community. Schools should organize structured courses and workshops on children with ADHD to prepare teachers on how to deal with the needs of said children. In addition, integration of the ADHD knowledge improvement

program into teachers' educational and training programs should be considered. Future studies need to be conducted on larger samples and on teachers of all educational levels to assess the magnitude of their knowledge level for better management of ADHD in school children. Further research is also needed in various regions of Saudi Arabia, with a longer follow-up period required to assess the long-term impact of the aforementioned awareness program.

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Ethical approval

An informed consent was obtained from each participant after explaining the study in full and clarifying that participation is voluntary. Data collected were securely saved and used for research purposes only.

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Conflict of interests

The authors declare that there are no conflicts of interest.

Informed consent:

Written informed consent was obtained from all individual participants included in the study.

Data and materials availability

All data associated with this study are present in the paper.

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