

Awareness and perceptions regarding autism among school teachers in Jazan region, Kingdom of Saudi Arabia

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ABSTRACT

Background: Identification of Autism Spectrum Disorder (ASD) especially at early stages is highly important to improve the quality of life and help to decrease the disease burden. This study was performed to assess the school teachers' level of knowledge and perception regarding Autism. **Materials and Methods:** An observational cross-sectional study was carried out in the Jazan region among a random sample of school teachers (males and females) who are working at the governmental primary Schools, throughout the scholastic year 2019-2020. A structured validated self-administered questionnaire was used for data collection. It includes three sections: sociodemographic information of the participants, the Autism Knowledge Questionnaire (AKQ), and statements exploring the teachers' attitudes toward children with autism. **Results:** The study included 403 primary school teachers. The age of 47.1% of them ranged between 35 and 44 years. Slightly more than half (50.9%) were males. Overall, the total autism knowledge score ranged between 2 and 26, out of a possible 30 with a median (interquartile range "IQR") of 15 (12-18). Teachers who ever encountered a child with autism had higher significant knowledge scores about autism compared to their counterparts (mean ranks were 263.95 and 179.32, respectively), $P < 0.001$. Female compared to male teachers more significantly agreed that teachers not trained in special education should not be expected to deal with a child with autism, $P = 0.018$. Teachers aged between 35 and 44 years are more willing to have an autistic child in their class in compare to those ages ≥ 55 years that they would not want children with autism in their class, $P = 0.036$ and more interested in attending training in the area of childhood developmental and behavioral disorders, $P = 0.010$. Postgraduate teachers were more agreed than Bachelor holders that teachers not trained in special education should not be expected to deal with a child with autism, $P = 0.001$. Diploma-holder teachers were more agreed than postgraduates that children with autism are too impaired to benefit from activities of a general school, $P = 0.019$ and students with Autism should be given every opportunity to function in the regular education classroom whenever possible, $P = 0.028$. **Conclusion:** The knowledge about autism among primary school teachers is average in general, however, they expressed mostly positive attitudes towards autistic children.

Keywords: Autism, knowledge, perception, primary schools, teachers

Introduction

Autism Spectrum Disorder (ASD): Which includes autistic disorder, Asperger's disorder, and pervasive are a lifelong neurodevelopmental disorder a set of clinical phenotypes characterized by behavioral challenges, communication deficits, and abnormalities in social interaction.^[1] The etiology is found to be multifactorial with predominate genetics to environmental causes.^[2]

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How to cite this article: Otaif EA, Salih SM, Mahfouz MS. Awareness and perceptions regarding autism among school teachers in Jazan region, Kingdom of Saudi Arabia. J Family Med Prim Care 2023;12:2614-21.

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Received: 12-06-2023

Revised: 11-07-2023

Accepted: 03-08-2023

Published: 21-11-2023

Access this article online

Quick Response Code:



Website:
<http://journals.lww.com/JFMPC>

DOI:
10.4103/jfmprc.jfmprc_968_23

Autism Spectrum Disorder (ASD) occurs more often in males than females in a ratio of 4:1.^[3] The earliest signs recognized are sleeping, eating difficulties, and delayed speech.^[4]

According to estimates by the United States (US) Centers for Disease Control and Prevention (CDC), the prevalence of ASD in the US increased from one in 150 to one in 68 from 2000 to 2014.^[5] The studies believe that the sharp increase in ASD prevalence is due to the effect of changing the diagnostic criteria and increasing awareness by the health care professional, teachers and families.^[6]

The prevalence of ASD in Saudi Arabia is roughly estimated to be 18/10000. However, the burden of ASD in Arab Gulf countries including Saudi Arabia is still unclear and a higher number of dropped cases is expected in an area with less developed child psychiatric services, centers for case reporting, difficult access to care, and lack of community awareness.^[7]

Identification of ASD especially at early stages is highly important and could enable Early Intensive Behavioral Intervention (EIBI) to improve the quality of life and create a suitable environment for autistic children and help to decrease the disease burden.^[8]

Whereas there is increasing worldwide awareness and research on childhood autism, more important to increase awareness especially in school teachers since they will be guiding students for future life and making them capable of leading out their potentialities for controlling their environment. This study will not only evaluate the recruited teachers' awareness but also help education institutes and organizations to increase awareness levels regarding autism.

While a few researches have been carried out in Saudi Arabia after a thorough literature search we found only two studies done in Jeddah and Al-Qassim Regions assessing knowledge and attitude about ASD among school teachers. Knowledge of primary school teachers about autism is very essential for primary care health providers who are usually in the first line of diagnosing children with autism, together with primary school teachers.^[9] To our knowledge no study was done locally assessing awareness and perceptions regarding autism among primary school teachers, therefore, this study was conducted to evaluate awareness and perceptions regarding autism in Jazan Region.

Materials and Methods

Observational cross-sectional study was carried out in the Jazan region, which is located in the south-western part of the kingdom, with an area of 11,671 km² and a population of about 1.4 million. The region comprises 14 governorates and is located alongside the Red Sea from its western borders with over 100 islands located in the sea and a 120 km border with Yemen at the south. There are two main educational departments; the General Administration for Education in Jazan City and the Department of Education in Sabya City, where the study was

conducted. Jazan is the capital city of the region; it involves one of the important ports for the Kingdom. Sabya City is located at an elevation of 36 meters above sea level and it the second biggest city in Jazan Region. The study was conducted at primary schools at the general administration for Education in Jazan and department of education in Sabya ($n = 1,026$ schools), divided into (528 schools for males and 498 schools for females).

School teachers (males and females) who are working at the governmental primary schools, Jazan Region, Saudi Arabia throughout the scholastic year 2019–2020 constituted the target population of the study (the number of male teachers is 6,386 and that female teachers is 7,755). Teachers who were serving students with special needs were excluded from the study.

As there is no previous study estimated the prevalence of Autism knowledge among teachers, we assume a prevalence of autism knowledge level (P) as 50% with a 5% margin of error (d) and 95% confidence level ($1-\alpha/2$), the minimum sample size required was estimated to be (N) 384, according to the following equation:

$$N = \frac{(z)^2 * p * (1 - p)}{(d)^2}$$

Where Z is a constant = 1.96.

This sample size was increased by 10% to 420 participants to compensate for possible none or incomplete responses.

Stratified random sampling technique with equal allocation was adopted to ensure perfect representativeness of the sample. The schools were divided into two strata according to their tracks (General Administration for Education in Jazan and Department of Education in Sabya), then were stratified again by rural and urban and further male and female schools. Thus eight strata were created and almost 52 teachers were chosen from each stratum. Therefore, two schools were chosen from each stratum and all teachers were enrolled consecutively till the sample size reached from each school separately.

A structured validated self-administered questionnaire was used for data collection. It has been used previously and proven for reliability and validation in Oman.^[10]

The questionnaire includes three sections:

Section 1: Includes sociodemographic information of the participants (gender, nationality, educational level, position, teaching experience, type school level and type) as well as other questions about communication or previous experiences with individuals with Autism.

Section 2: The Autism Knowledge Questionnaire (AKQ), which contains 30 items submitted to measure teacher's knowledge of Autism. Questionnaire mainly measures and assesses the knowledge of general information about the characteristics

of students with Autism (signs, and symptoms) as well as their etiology. All questions were based on True/False statements; however, the option 'Don't Know' was included and teachers will be instructed to select this response instead of guessing.

Section 3: The teachers' attitudes toward children with autism. It contains 10 points Likert scale response system statements ranging from 0 (strongly disagree) to 4 (strongly agree).

The permission for using the questionnaire was taken by email contact with the corresponding author and he responded by sending the questionnaire.

A pilot study was conducted to examine the clarity of the questionnaire and assess the feasibility of the main study and measure the average time needed to complete the questionnaire by teachers. Forty teachers from one or two schools other than included in the study were recruited for that. As feedback, the questionnaire was clear, the methodology was sound and an average 12 minutes were needed to fill the study questionnaire. The results of the pilot sample were excluded from the main study.

This study was conducted in accordance to ethical standards within the political borders of the Kingdom of Saudi Arabia and approved by the Jazan Health Directorate Ethical Committee (No. 2009). The study also obtained approval from the General administration for education in Jazan and Department of education in Sabya. Before beginning of the study, all selected participants were informed about the purpose and details of the study and asked to sign a consent form. Participants were told that they have the freedom to participate or to withdraw from the study before completion without any consequences. The anonymity of participants was emphasized, and confidentiality was strictly maintained on all collected questionnaires. Also, we sought ethical approval from the Jazan Health Directorate Ethical Committee and final approval from Jazan health administration.

The Statistical Package for Social Science (SPSS) (Version 25.0, IBM, Chicago, IL, USA) was used to analyze the data. Collected data were checked on regular bases by the researchers. Descriptive statistics was used first to summarize the data using frequency distribution, graphs, means, standard deviation (SD), median, and interquartile range (IQR). To test for the association between nominal data, Chi Square test was used. Moreover, the normality test (Shapiro-Wilk test) was done for the total knowledge score. It was not Normally distributed, thus non-parametric statistical tests were applied; Mann-Whitney test to compare the knowledge score between two different groups and the Kruskal-Wallis test to compare it between more than two groups. *P*-values less than 0.05 were used to indicate statistical significance.

Results

The study included 403 primary school teachers. Table 1 presents their socio-demographic characteristics. The age of 47.1% of

Table 1: Socio-demographic characteristics of the participants (n=403)

	Frequency	Percentage
Age (years)		
25-34	92	22.8
35-44	190	47.1
45-54	108	26.8
≥55	13	3.2
Gender		
Male	205	50.9
Female	198	49.1
Educational level		
Diploma	79	19.6
Bachelor	306	75.9
Master/PhD	18	4.5
Number of years in teaching		
4 or less	54	13.4
5-10	104	25.8
>10	245	60.8

them ranged between 35 and 44 years whereas that of 26.8% ranged between 45 and 54 years. Slightly more than half (50.9%) were males. All were Saudis. Majority of them (70.9%) were Bachelor holders whereas 4.5% had master's or PhD. Most of them (60.8) had more than 10 years of experience in teaching. History of ever encountering with a child with Autism was reported among 26.8% among the participants.

Knowledge about autism

It is realized from Table 2 that the majority of the teachers knew that there is no some types of food can lead to autism (89.1%), children with autism need special education (85.4%), early diagnosis can very much improve children with autism (80.9%) and there are no available adequate services for children with autism in Jazan (75.2%). However, less than one-third of them could recognize that diagnosis of autism will bring a negative attitude towards the child (32%), autism affects males more than females (31.8%), autism cannot be prevented completely (30%), there is no curative treatment for autism (29.5%), the child with autism does not show specific emotions (26.6%), and autism continues for life (23.3%).

Overall, the total autism knowledge score ranged between 2 and 26, out of a possible 30 with a mean \pm SD of 14.5 ± 5.1 and median (IQR) of 15 (12–18) as shown in Figure 1.

Teachers who ever encountered with a child with autism had a higher significant knowledge scores about autism compared to their counterparts (mean ranks were 263.95 and 179.32, respectively), $P < 0.001$. Other studied factors (age, gender, educational level, number of years of teaching) were not significantly associated with the knowledge score Table 3.

Perceptions towards children with autism

Most of the participants either agreed or strongly agreed that the government should allocate more resources for the provision

Table 2: Response of the participants to knowledge statements regarding autism

	Correct answer	
	No	%
I can easily identify a child with autism (Yes)	230	57.1
Autism affects males more than females (Yes)	128	31.8
Autism continues for life (Yes)	94	23.3
Majority of children with autism suffer from mental retardation (No)	229	56.8
Autism appears in the early years of life (Yes)	240	59.6
Children with autism need special education (Yes)	344	85.4
There is a curative treatment for autism (No)	119	29.5
Early diagnosis can very much improve children with autism (Yes)	326	80.9
Majority of children with autism are geniuses (have distinguished skills) (Yes)	203	50.4
The child with autism suffers from social stigma in Gazan (yes)	199	49.4
Diagnosis of autism will bring a negative attitude towards the child (yes)	129	32.0
Autism can be prevented completely (No)	121	30.0
Autism is more commonly affecting children of high-income families (no)	137	34.0
Autism is more commonly affecting children of high-education families (No)	157	39.0
Available services for children with autism in Gazan is adequate (No)	303	75.2
Autism can develop due to child maltreatment/negligence by parents early in life (No)	224	55.6
Some types of food can lead to autism (No)	359	89.1
Genetics play an important role in autism development (Yes)	154	38.2
Vaccination can cause autism (No)	189	46.9
The cause of autism is not yet known for sure (Yes)	202	50.1
The child with autism does not show specific emotions (Yes)	107	26.6
The child with autism does not look at others' eyes (maintains gaze) (Yes)	211	52.4
The child with autism does not enjoy the presence of others (Yes)	244	60.5
The child with autism can communicate with others through body movements or symbols (Yes)	229	56.8
There is no or limited speech development in children with autism (Yes)	215	53.3
The child with autism is over-talkative (no)	283	70.2
Children with Autism may lose the acquired speech (Yes)	168	41.7
Children with autism show frequent movements of the hands and probably the body (Yes)	287	71.2
The adaptation to environmental changes is very much limited for children with autism (Yes)	234	58.1
The child with autism does not like to change the pattern of eating, clothing, and play (Yes)	191	47.4

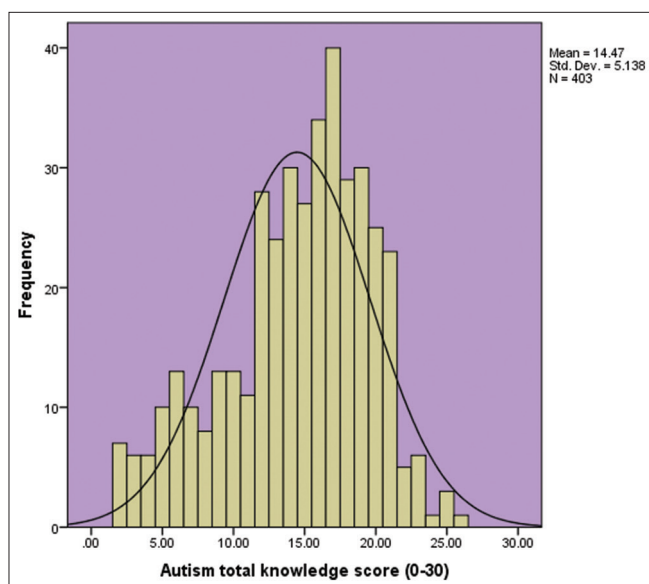


Figure 1: Total Autism knowledge score among the participants

of services for children with special needs (91.8%), students with Autism should be given every opportunity to function in the regular education classroom whenever possible (82.9%) and

they are interested in attending training in the area of childhood developmental and behavioral disorders (74.4%). However, less than half of them either agreed or strongly agreed that children with autism should be taught in separate schools (44.9%), teachers not trained in special education should not be expected to deal with a child with autism (41%), children with autism are too impaired to benefit from activities of a general school (39.2%) and they would not want the children in their class to have to put up with children with autism (24.8%). Almost two-thirds of the teachers (37.2%) either disagreed or strongly disagreed that there is adequate provision of services for children with autism in the Jizan region [Table 4].

Less than half of female teachers (46.5%) compared to 35.6% of male teachers agreed that teachers not trained in special education should not be expected to deal with a child with autism. The difference was statistically significant, $P = 0.018$. Almost a third of teachers aged between 35 and 44 years (29.5%) compared to 15.4% of those aged ≥ 55 years agreed that they would not want the children in their class to have to put up with children with autism, $P = 0.036$. Also, 80% of teachers aged between 35 and 44 years compared to 61.5% of those aged ≥ 55 years agreed that they are interested in attending training in the area of

Table 3: Factors associated with knowledge about autism among the participants

	Knowledge about autism score			P
	Median	IQR	Mean rank	
Age (years)				
25-34 (n=92)	14	11-18	194.59	0.661
35-44 (n=190)	15	12-18	199.33	
45-54 (n=108)	16	12-18	213.68	
≥55 (n=13)	15	9-18	196.42	
Gender				
Male (n=205)	15	11-18	195.50	0.253*
Female (n=198)	16	12-19	208.73	
Educational level				
Diploma (n=79)	15	12-18	198.70	0.821**
Bachelor (n=306)	15	12-18	203.68	
Master/PhD (n=18)	14.5	6.75-20.25	187.86	
Number of years in teaching				
4 or less (n=54)	15	12-19	212.45	0.499**
5-10 (n=104)	14	11-18	191.40	
>10 (n=245)	16	12-18	204.20	
History of ever encountered a child with Autism				
No (n=295)	14	10-17	179.32	<0.001
Yes (n=108)	17	15-20	263.95	

*Mann-Whitney test; **Kruskal-Wallis test

Table 4: Response of the participants to statements of their perception towards children with autism

Statements	Strongly disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly agree n (%)
Only teachers with extensive special education training can help a child with autism.	24 (6.0)	82 (20.3)	59 (14.6)	157 (39.0)	81 (20.1)
Children with autism should be taught in separate schools.	62 (15.4)	99 (24.6)	61 (15.1)	123 (30.5)	58 (14.4)
I would not want the children in my class to have to put up with children with autism.	116 (28.8)	132 (32.8)	55 (13.6)	72 (17.9)	28 (6.9)
Teachers not trained in special education should not be expected to deal with a child with autism.	46 (11.4)	94 (23.3)	98 (24.3)	122 (30.3)	43 (10.7)
Children with autism are too impaired to benefit from the activities of a general school.	37 (9.2)	108 (26.8)	100 (24.8)	128 (31.8)	30 (7.4)
Teachers are trained in accessing and providing useful visual supports (pictures, boards, etc.) for students with Autism in regular education classrooms.	31 (7.7)	39 (9.7)	68 (16.9)	188 (46.6)	77 (19.1)
Students with Autism should be given every opportunity to function in the regular education classroom whenever possible.	14 (3.5)	15 (3.7)	40 (9.9)	194 (48.2)	140 (34.7)
There is adequate provision of services for children with autism in the Jizan region.	136 (33.7)	135 (33.5)	80 (19.9)	41 (10.2)	11 (2.7)
The government should allocate more resources for the provision of services for children with special needs.	6 (1.5)	4 (1.0)	23 (5.7)	149 (37.0)	221 (54.8)
I am interested in attending training in the area of childhood developmental and behavioral disorders.	6 (1.5)	25 (6.2)	72 (17.9)	187 (46.4)	113 (28.0)

childhood developmental and behavioral disorders, $P = 0.010$. More than half of postgraduate teachers (55.6%) compared to 35.9% of Bachelor holders agreed that teachers not trained in special education should not be expected to deal with a child with autism, $P = 0.001$. Nearly half (50.6%) of Diploma holder teachers compared to only 33.3% of postgraduates agreed that children with autism are too impaired to benefit from activities of a general school, $P = 0.019$. Similarly, majority of Diploma holder teachers (89.9%) compared to 66.7% of postgraduates agreed that students with Autism should be given every opportunity to function in the regular education

classroom whenever possible, $P = 0.028$. Perception of teachers towards children with Autism was not significantly associated with their experience in teaching. Teachers with a history of ever encountered with a child with Autism were more likely to agree than their counterparts that children with autism should be taught in separate schools (56.5% versus 40.7%), $P = 0.014$. However, 13.9% of teachers with a history of ever encountering a child with Autism compared to only 5.4% of their counterparts disagreed that they are interested in attending training in the area of childhood developmental and behavioral disorders, $P = 0.009$.

Discussion

School teachers should be well prepared and have specialized skills to serve autistic students, especially since the condition is not very rare in the Kingdom of Saudi Arabia.^[7] Limited knowledge and inadequate perception of teachers regarding autism could significantly impact both the students with autism and the education process as a whole.^[11]

Teachers' Knowledge of ASD

School teacher's knowledge about the criteria of ASD is essential to specify if child had ASD early and help him/her in having appropriate care and transfer him/her to a particular center that can more professionally handle them.^[12] Since this important subject is limited to study in KSA, particularly in Southern Region, this study was carried out to assess the school teachers' knowledge and perception regarding Autism in the Jazan region and identify associated factors with knowledge and perception.

It is realized from this study that the total autism knowledge score ranged between 2 and 26, out of a possible 30 with a median (IQR) of 15 (12-18), which indicate average level. Close to this finding, a recent Saudi study carried out in Al-Qassim Region reported that 48.7% of teachers were knowledgeable regarding Autism.^[10] Also, low to intermediate levels of knowledge in both special and general education school teachers were observed in another study carried out earlier in Jeddah.^[13] In Oman, Al-Sharbati *et al.* reported poor knowledge about children with ASD among the teachers.^[14]

By a study carried out among teachers in Oman,^[14] the present study reported that relatively few teachers could recognize that autism affects males more than females and almost 60% of teachers believed that Autism can be discovered early in life. This is very important as early discovery is very vital for the prognosis of the affected students.

Majority of teachers in the present study could recognize that children with autism need special education and early diagnosis can improve children with autism. Buell *et al.* indicated that school teachers were in more need of training programs regarding dealing with autism children.^[15]

By a study carried out in Al-Qassim Region (KSA),^[10] teachers who ever encountered with a child with autism in the present study had higher significant knowledge scores about the autism compared to their counterparts.

There was no gender difference between teachers regarding their level of knowledge about Autism. The same has been reported by others in studies carried out in Jeddah^[13] and Al-Qassim (KSA).^[10]

Teachers' Perception about ASD

In the current study, most of the teachers agreed that the government should allocate more resources for the provision of

services for children with special needs, students with Autism should be given every opportunity to function in the regular education classroom whenever possible and they are interested in attending training in the area of childhood developmental and behavioral disorders, which reflect a positive perception towards autistic children. In another Saudi study, teachers had negative attitudes toward inclusion of Autistic children in general education. The difference could be because the other study was comparing teachers from Saudi Arabia with those from the USA.^[16] The relatively more positive attitude observed in the present study could be explained by improved awareness and training among teachers in public schools about disabled students in the last few years. Similarly, in Australia, Ann Garrad *et al.* (2019) reported that primary school teachers had a positive attitude towards the inclusion of children with autism in mainstream schools.^[17]

In the present study, a considerable proportion of teachers believed that children with autism should be taught in separate schools, teachers not trained in special education should not be expected to deal with a child with autism, and children with autism are too impaired to benefit from activities of a general school. Generally speaking, there is an apparent gap of knowledge within the literature in specifying strategies being applied by teachers to ensure academic and social engagement of autistic students in normal classes so that the positive attitude of teachers is translated into positive action. In this context, it has been documented that the most significant factor about the successful inclusion of autistic students in mainstream teaching lies in the strategies individual teachers employ, rather than their attitudes.^[17]

Almost two-thirds of the teachers in the present study agreed that there is inadequate provision of services for children with autism in the Jizan region. Further investigation is needed to clarify the details of this important finding.

Female teachers in the current study were more in favor than males of no dealing with teachers not trained in special education with a child with autism. Additionally, younger teachers were more agreed than older teachers that children with autism should not mix up with normal children and they are interested in attending training in the area of childhood developmental and behavioral disorders. Several studies have focused on the importance of increase teachers' training to improve their efficacy in handling autistic students.^[18-20]

Higher qualified teachers in the present study were more agreed that teachers not trained in special education should not be expected to deal with a child with autism and children with autism should not be allowed in general schools. Also, teachers with history of ever encountering with a child with Autism were more likely to agree than their counterparts that children with autism should be taught in separate schools and they are less interested in attending training in the area of childhood developmental and behavioral disorders. In a study carried out recently in Australia,^[17] teachers with higher levels of experience in ASD teaching

and lower levels of ASD training were against teaching ASD students in general schools. Park and Chitiyo (2011) reported an association between specialist training and teaching experience on one side and a positive attitude towards Autistic children on the other side.^[18] Numerous studies suggest that experience of teachers in dealing with students with autism play important role in the formation of teachers' overall attitudes.^[19,21-23]

Strengths and limitations

Strengths of the present study can be summarized in the inclusion of enough sample size representing governmental primary Schools in Jazan Region, Saudi Arabia, in addition to inclusion of both male and female teachers. However, there are a few limitations in this study. The study was carried out in Jazan Region, therefore the findings cannot be generalized over other regions of the KSA. The cross-sectional design of the study limits our ability to make causal inference among studied variables. We did not include teachers from the special education stream in the present study, since our objective is to explore the knowledge and perception of mainstream education teachers. Another limitation is the possibility that teachers responded to questions concerning attitude in a way that they perceived as favorable answers, which might exaggerate the positivity in their attitude towards autistic children.

Conclusion

In conclusion, the knowledge about autism among teachers working at the governmental primary schools, the Jazan Region, Kingdom of Saudi Arabia is average in general, with a deficiency in some important aspects such as the fact that autism affects males more than females, which cannot be prevented completely, continues for life with no curative treatment and the child with autism does not show specific emotions. Teachers who ever encountered a child with autism were more knowledgeable about the disease. Overall, the teachers expressed a positive attitude towards autistic children, with more females than males agreeing that teachers not trained in special education should not be expected to deal with a child with autism. Perception of teachers towards children with Autism was not significantly associated with their experience in teaching.

Based on the current study's results, we recommended the following:

- Improvement of the teachers' knowledge about Autism through organizing training courses at schools with the participation of psychiatrists in implementing such courses.
- Mass media could have an active role in improving teachers' knowledge and attitude towards Autism through community educational campaigns.
- Services for children with autism in Jazan should be available and adequate. Discussion with high authorities in this regard is highly needed.
- Future studies are recommended to include teachers of special education in addition to teachers from mainstream education to have more comprehensive information.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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