Alobaid AS, Almogbel E. Awareness of Autism Spectrum Disorder Among Pre-School Teachers in Qassim Region, Saudi Arabia. *Health Psychology Research*. 2022;10(3). doi:10.52965/001c.37676

General

Awareness of Autism Spectrum Disorder Among Pre-School Teachers in Qassim Region, Saudi Arabia

Arwa S Alobaid[1] [a], Ebtehal Almogbel[2]

[1] Family Medicine Academy (FMA), Qassim, Kingdom of Saudi Arabia, [2] Family Medicine Department, College of Medicine, Qassim University, Kingdom of Saudi Arabia

Keywords: Autism Spectrum Disorder, preschool teachers, children, awareness, Saudi Arabia

https://doi.org/10.52965/001c.37676

Health Psychology Research

Vol. 10, Issue 3, 2022

Background

Autism Spectrum Disorder (ASD) is a lifelong condition that affects children and early intervention to provide an appropriate education for ASD children is necessary.

Objective

This study aimed to assess the awareness of ASD among preschool teachers in Qassim region, Saudi Arabia.

Methods

A cross-sectional study was carried out from December 2021 to February 2022 among preschool teachers in the Qassim region of Saudi Arabia. A random sampling technique was applied to select teachers through the Ministry of Education website.

Results

A total of 164 preschool teachers took part in the questionnaire. The most common age group was 30 – 40 years (58.5%). The total mean score of AKQ was 15.0 (SD 4.97). Nearly three-quarters (74.4%) of the teachers were classified as having a poor level of awareness while 25.6% had a good awareness level. Factors associated with a good awareness level include being a teacher (p=0.034) and having direct contact with autistic children (p=0.016). It is important to note that having more years of experience was significantly associated with knowledge regarding the correct pattern to diagnose children with autism (p=0.049).

Conclusion

The awareness of preschool teachers regarding ASD was deficient. Teachers who are in contact with autistic students demonstrated better knowledge than the rest of the preschool teachers. Preschool teachers are expected to maintain high standards in their work to meet the children's abnormal development and to identify them from an early stage, then refer them to diagnosis services.

INTRODUCTION

Autism Spectrum Disorder ASD is a lifelong condition characterized by complex development, including persistent difficulties with social communication, restricted interests, and repetitive behavior; these behaviors are different between individuals with autism, and so the degree of disability in functioning varies.[1] In 1948, autism was described by Leo Kanner as a syndrome of social communication deficits combined with repetitive and stereotyped behaviors in children. It can be present in infant or early childhood, and because of minimal social demands and support from parents or caregivers in early years, it may not be detected until later. About 1% of the general population is affected by ASD. Boys are affected by autism more than girls with a ratio of about 4:1. Typically, autism is noted during the first or second year of life.[2] The causes of ASD are not known.

[a] **Corresponding author:**
Arwa Saleh Alobaid, Family Medicine Academy (FMA), Qassim, Kingdom of Saudi Arabia; arwaso369@gmail.com.

One's environment and genes play an important role in ASD, as reported by researches.[3]

Statistics from the World Health Organization indicate that the global prevalence of ASD is about one in 160 children.[4] The prevalence of autism spectrum disorder (ASD) is about 1 in 44 children, according to estimates from CDC's Autism and Developmental Disabilities Monitoring (ADDM) Network.[5] The overall prevalence in Asia is 0.36%.[6] In Arab Gulf countries, it ranges from 1.4 to 29 per 10,000 persons, as revealed by a systematic review of the epidemiology of autism in 2014.[7] Locally in Saudi Arabia, a study in 2 major cities revealed that the overall prevalence of autism was 2.81 per 1,000 children for both Jeddah and Makkah.[8] The Saudi ministry of health has indicated that 1 in every 160 children is affected by ASD.[9]

The prevalence of ASD is increasing through the years[10] and is now becoming more common than cancer, pediatric Acquired Immune Deficiency Syndrome (AIDS) combined, and type-1 diabetes,[11] which reflects a significant number of children attending kindergarten who are affected with ASD. The increase in the prevalence of ASD among children requires preschool teachers to maintain high standards of work to meet the children's abnormal development, and to identify them from an early stage, and then to refer them to diagnosis services.[12]

Autistic children possess unique needs when it comes to learning that differ from other learners, requiring teachers to have specialized skills and to prepare very well to help serve students with autism both socially and in teaching.[13] As reported by the American Academy of Pediatrics (AAP) and the National Research Council (NRC), behavior and communication approaches help children with ASD by providing for the child and his family a structure, direction, and organization. For better long-term outcomes, early intervention is recommended.[14]

Therefore, pre-school teachers have to become aware about the criteria of autism spectrum disorder, to better detect cases early and take the necessary action to assess children with ASD, so as to get a better prognosis with early intervention. The most important step in detecting the cases early and providing the proper intervention is awareness.[15]

A lack of knowledge among teachers could remarkably affect the early detection of ASD children and, therefore, an early intervention to provide for an appropriate education for ASD children. Fixing this lack of knowledge will require either allowing individual teachers to take different or more effective actions or creating grounds for action though the collective knowledge and information held by teachers.[16]

In our country, in the Qassim region, Badaya city, a cross-sectional study was performed between December 2017 and March 2018 among school teachers to determine teachers' knowledge about autism in both genders. As documented in the study, the level of knowledge about autism from the 248 teachers who were sampled was 48.7%. A statistically significant difference appears between teachers who had previous contact with autism and those who had no contact.[15]

Another study in Saudi Arabia was conducted among teachers working in both segregated and inclusive schools in Jeddah district. The result showed a lake of knowledge about autism by school teachers, as the mean value of total level of knowledge that school teachers had about autism disorder was (0.58) and lay between (0.5 - 0.7). Different variables such as teachers' position, education level, experience, and contact with students with Autism were found to have a significant direct effect on the level of teachers' knowledge about Autism.[17]

A study was done in Yemen in 2019 to figure out what pre-school teachers know about ASD. Generally, pre-school teachers have a low level of knowledge about ASD. Results showed a significant difference in knowledge about ASD according to experience level. Moreover, the study emphasizes that the lower the level of teachers' education, the less they know about ASD.[18]

Another study measures the awareness about autism among school teachers in Oman in 2013. 40% of teachers thought that autistic children would not express emotions, and 55.5% thought they would not maintain eye contact. Those who thought that a child with autism would not enjoy the presence of others were three-quarters, and about 53.7% supposed that such children could only communicate with others nonverbally. In general, the knowledge about children with ASD is low among the teachers in Oman.[19]

A new study conducted in 2020 in Babylon Province showed that the majority of kindergarten teachers have a moderate level of early detection knowledge, which constitutes 70.6%, and there is a significant difference between the governmental and private institution, which indicates that ASD knowledge among private kindergarten teachers was higher than among the governmental teachers.[20]

A Chinese study in 2016 demonstrated that the knowledge of ASD among preschool teachers was lacking. The study's evidence pointed to a significant association between education level and knowledge about ASD among preschool teachers. As demonstrated in the research, a teacher's knowledge about autism is solely dependent on their teaching experience and education levels. Thus, preschool teachers were less educated and informed about autism.[21]

In India, to assess primary school teachers' knowledge of ASD, a self-report questionnaire was given to them. 95% of the teachers were aware of 'autism' but 83% of them admitted that their knowledge was inadequate. At least 50% of the teachers identified 6 of the 12 signs and symptoms correctly. Teaching experience had a strong positive correlation with knowledge and the veterans clearly outperformed the novices.[22]

In Yenagoa city, Bayelsa State, a cross-sectional study was carried out among primary school teachers. Among the 100 teachers studied, 30% were males while 70% were females. 34% of teachers had never heard of the word autism. Consequently, 21.2% of those who agreed to have heard about autism had consumed the wrong information, with 18.2% saying that it was a psychiatric condition similar to madness. About 35% of the respondents heard about the word autism from random discussions with their fellows and individuals already informed about the disorder, while 27.3% heard it through the media.[23]

Another cross-sectional survey was performed in Pakistan, ¨South Asia," to assess the knowledge and perceptions regarding autism among primary school teachers. A 71.2 % of them had knowledge about autism and most of them attended a behavioral class (including child psychology, adult psychology, early childhood education, public health, and developmental disabilities).[24]

A systematic review was conducted from four databases (Web of Science, Scopus, PsycInfo, and Google Scholar) during the period of 2015–2020. In total, 25 articles were analyzed. The results show that, in general, teachers' knowledge of ASD is poor. It depends on the education stage being taught, as knowledge was higher in early childhood teachers and in university professors, prior to training and possibly prior to contact with students with ASD.[25]

This research examines firstly the awareness about autism among pre-school teachers as they have a high level of exposure to the developing child, and they are in a position where they can identify who may have ASD and refer them for more assessments. Secondly, this research aims to find out if there are any significant differences in school teachers' knowledge about Autism depending on teachers' age, position, living governorate, education level, teaching experience, and contact with students with Autism.

MATERIALS AND METHODS

A cross-sectional descriptive study was conducted among pre-school teachers in kindergartens in the Qassim region to determine preschool teachers' awareness of autism in the period from December 2021 to February 2022. The Qassim Region is in northcentral Saudi Arabia. The study's population was comprised of kindergarten teachers in the Qassim region.

SAMPLE SIZE

The sample size of 257 teachers was calculated using the software EPI-INFO.2, in accordance with Center of Disease Control and prevention (CDC) guidelines for sample size calculation of descriptive studies.[26]

$$\text{Sample size} = n = \frac{z^2\ 1-\alpha\ \ p\,(1-p)}{d^2}$$

Where n = sample size, d = Margin of error (percentage in decimal form), $z_{1-\alpha}$ = z-score, and P = sample proportion. Set at 95% confidence level, 5% as accepted margin of error, a population estimated to be 782 teachers, and an estimated prevalence of 48%.

SAMPLING PROCEDURE

At first stage of sampling, 105 public kindergartens were selected through a random sampling technique from total 231 public kindergartens[26] in the Qassim region. The Qassim region has nine sectors in the department of education (Buraidah, Al Badaya, AlAsyah, An Nabhaniyah, Uyun Al Jawa, Riyadh Al Khabra, Uglat Asugour, Qusaiba, Al Fawarah). An official list of public kindergartens was obtained from the website of the ministry of education's governmental kindergartens in the Qassim region.[27] All of the teachers were female as the system in the Kingdom of Saudi Arabia employs only female teachers in kindergartens. There were, total, 782 teachers in kindergartens, with an average of three to four teachers in each kindergarten. At the second stage, all eligible participants in the selected kindergartens were invited to participate in the study. Teachers who were working for less than one year as kindergarten teacher were excluded.

STUDY TOOL

Data was collected using a validated structured questionnaire adopted from a previous study[15] and modified according to our objectives, with permission from the authors. The questionnaire contains two parts. The first part is the demographic data of the participant (age, position, living governorate, education level, and teaching experience) and a question about previous contact or experiences with autistic children. The second part, The Autism Knowledge Questionnaire (AKQ), contains 32 items proposed to measure a teacher's knowledge about Autism. The Autism Knowledge Questionnaire (AKQ)[15] was modified according to our objectives, and we added two questions: one is about impact of electronic devices (e.g., smart phones, Ipad, and T.V.) on causing autism, and another is about the effect of vaccine uptake on developing of ASD, as this is a common myth in our community; then the AKQ was given to the qualified specimen of participants individually. The questionnaire mainly assesses and measures knowledge pertaining to general information about the characteristics of children with Autism and how those children with this disorder behave. The questions in this section were presented as True/False statements; however, the option 'Don't Know' was included and teachers were instructed to select this response instead of guessing.

VARIABLES

INDEPENDENT VARIABLES

The following independent variables were considered: age, position, living governorate, education level, teaching experience and a previous contact or experiences with autistic children.

DEPENDENT VARIABLES

The dependent variable is the Autism knowledge Questionnaire (AKQ).

DATA COLLECTION PROCEDURE

We contacted administrators of all kindergartens and asked permission to collect data from teachers in their kindergartens.

A self-administered Arabic questionnaire with informed consent was distributed through an online survey tool named Google Forms to all the participants. Because of the COVID-19 pandemic and online teaching in kindergartens,

we used an online survey. We got only 164 answers from the total sample of 257, reflecting a 63% response rate.

ETHICAL CONSIDERATION

Ethical approval of the study was taken from the Qassim Region Research Ethics Committee (QREC). The Education Administration in Qassim was contacted through telephone and permission for data collection was obtained. Informed consent was taken from all participants after we explained the aims of our study for them. The participants were assured that their responses will be anonymous, confidential, and will be used for the scientific purpose only.

STATISTICAL ANALYSIS

The data were analyzed using Statistical Packages for Social Sciences (SPSS) version 26 Armonk, NY: IBM Corp. The awareness toward ASD was measured using a modified Autism Knowledge Questionnaire (AKQ), a 32-item questionnaire where all correct answers had been identified, presented, and were coded as 1 while the incorrect answers had been coded with 0. Negative questions had been recoded reversely to avoid bias in the score. The total awareness score has been calculated by adding all 32 items. A possible score range from 0 to 32 points can be generated, however, the actual score based on respondents' response was 0 – 26 points. This indicates that the higher the score, the higher the awareness toward ASD. Participants were classified as having poor awareness if the total score was 60% or below, while good awareness if the score was above 60% of the total score points. Descriptive statistics were presented using numbers, percentages mean, and standard deviations. The level of awareness was compared to the socio-demographic characteristics of teachers by using Chi-square test. P-value less than 0.05 was considered statistically significant.

RESULTS

A total of 164 pre-school teachers responded to our survey. As described in Table 1, the most common age group was 30 – 40 years old (58.5%), with half of them (50%) coming from Buraidah and nearly all were teachers in a profession (87.8%). With regards to education, bachelor's degrees constitute most of the teachers (81.1%). With respect to years of experience, 40.2% had 5 – 10 years of experience. The proportion of teachers who had direct contact with autistic students was 25.6%.

The assessment of AKQ is given in Table 2. It can be observed that the top 5 statements where teachers showed better awareness were: "Autism disorder can be diagnosed through behavioral observation" (correct answer: 85.4%), "Behavioral intervention is considered the most effective treatment method of Autism" (correct answer: 80.5%), "Children with Autism demonstrate stereotypical behaviors like fluttering" (correct answer: 79.9%), "Children with Autism do not make any visual communication during a conversation with others" (correct answer: 76.8%), and "Children with Autism usually manifest special abilities like drawing and facts and figures remembering" (correct answer: 76.2%), while low awareness was seen in the statements related to: "Autism disorder is diagnosed by medical methods" (correct answer: 17.7%), "Most children with Autism have an intellectual disability" (correct answer: 17.1%), "Children with Autism tend to be auditory learners" (correct answer: 15.9%), "Medication can alleviate the core symptoms of Autism disorder" (correct answer: 10.4%), "With proper intervention, most children with Autism dis-

Table 1. Socio-Demographic Characteristics of the Pre-School Teachers (n=164)

Study Data	N (%)
Age Group	
• <30 years	22 (13.4%)
• 30 – 40 years	96 (58.5%)
• 41 – 50 years	43 (26.2%)
• >50 years	03 (01.8%)
Living Governorate	
• Buraidah	82 (50.0%)
• Al Badaya	19 (11.6%)
• AlAsyah	13 (07.9%)
• An Nabhaniyah	04 (02.4%)
• Uyun Al Jawa	05 (03.0%)
• Riyadh Al Khabra	07 (04.3%)
• Al Khabra	02 (01.2%)
• Uglat Asugour	24 (14.6%)
• Qusaiba	05 (03.0%)
• Al Fawarah	03 (01.8%)
Position	
• Teacher	144 (87.8%)
• Administrator	20 (12.2%)
Educational Level	
• Diploma	27 (16.5%)
• Bachelor degree	133 (81.1%)
• Master degree or higher	04 (02.4%)
Teaching Experience	
• <5 years	46 (28.0%)
• 5 - 10 years	66 (40.2%)
• >10 years	52 (31.7%)
Contact with Students with Autism	
• Yes	42 (25.6%)
• No	122 (74.4%)

order will eventually outgrow the disorder" (correct answer: 9.8%), and "Effect of the uses of electronic devices e.g. (smart phones, Ipad, T.V.) can cause autism" (correct answer: 8.5%).

We used Chi-square test in Table 3 to measure the relationship between the level of awareness and the socio-demographic characteristics of the preschool teachers. Based on the results, it was found that a good level of awareness was more prevalent among teachers in a profession (p=0.034). It was also found that preschool teachers with direct contact with autistic students were more associated with a good level of awareness (p=0.016). Other variables such as age group, living governorate, educational level and teaching experience did not show a significant relationship with the level of awareness (p>0.05).

DISCUSSION

The present study is conducted to examine the awareness level of preschool teachers regarding ASD. The awareness of preschool teachers regarding ASD was insufficient. The mean score of the Autism Knowledge Questionnaire (AKQ) was 15 (SD 4.97) out of 32 points with 74.4% classified as possessing a poor level of awareness while 25.6% were classified as possessing a good level of awareness. Consistent with these findings, several papers reported a lack of knowledge among teachers regarding ASD.[15,17,19,21,23] In contrast, a better knowledge among teachers had been reported by Ayub et al.[24] According to their reports, the majority (71.2%) of the primary school teachers demonstrated some knowledge about autism and they had shown a better understanding that the condition is related to neurological/mental disorders with attendance to behavioral classes significantly influencing their knowledge toward ASD. Interestingly, in a study by Arif et al[28] social media had a significant role in the increased awareness of primary school teachers regarding autism. Findings indicated that approximately 55% of the teacher's learned autism from social media; however, the researcher argued that while the role of social media cannot be discounted, the need to give formal training to teachers regarding the different features of autism is necessary as this will guide them in the early diagnosis of the condition.

The awareness level of our preschool teachers who had direct contact with autistic students was significantly better than those who had no contact with this type of condition. This is consistent with that of the Alharbi et al[15] study, which suggests that the higher level of knowledge among teachers was more associated with teaching in the public schools and previous contact with autistic students; however, they found no significant relationship between the level of autism knowledge among different educational levels, the grade level taught, experience and gender, indicating that all these factors were not relevant or were not predicted to be the influential factors of the level of knowledge toward autism. A similar study conducted in Pakistan[24] relates better knowledge associated with the attendance of behavioral classes, but found no association among age groups, gender, teaching experience, qualification, teacher training courses, and knowledge about autism, while in China,[21] they documented that a higher educational level and school type influenced the knowledge about ASD. In a cross-sectional study published in Nigeria,[29] evidence suggests that school type and teaching experience have no significant relationship with knowledge toward the disease, but prior training, as well as age, provided a positive effect on the knowledge. In our study, the knowledge about the correct pattern to diagnose children with autism was more associated with increasing years of experience.

A cross-sectional survey published by Al-Sharbati et al[19] found that 11% of school teachers had direct contact with autistic children, with most of them (89%) having heard about autism and expressing that they can easily identify students with autism. The author continued that 40% believed that a child with autism would not express emotions and considered that a child with autism would not maintain eye contact with others (55.5%). The study concluded that a majority of participants agreed the prognosis of autism could be significantly improved if diagnosed in early life.

In this study, we highlight some of the most important findings in the assessment of teachers' awareness of ASD. By using Autism Knowledge Questionnaire similarly to previous studies, we found that 85.4% of the teachers were aware that autism disorder can be identified through children' behavior in the classroom and most of the teachers (80.5%) were sure that behavioral intervention is the most important intervention for autism. Teachers also showed adequate awareness regarding the behavioral manifestation of the children with autism, such as children with autism demonstrating stereotypical behaviors (79.9%), offering no visual communication during a conversation with others (76.8%) and frequently showing special abilities (i.e. drawing, facts, and figure remembering) (76.2%) while they have shown limited awareness in some domains, including the causes of autism (8.5%), appropriate intervention (9.4%), medication to alleviate the symptoms (10.4%), intellectual disability of children with autism (15.7%), the role of medical method in the diagnosis of autism (17.7%), empathy of children with autism (22.6%), and the association between epilepsy and autism (25%). These findings implicate that many of the teachers had misconceptions about the disease. School administration should design proper training programs for teachers to educate them in diagnosing children with autism and to guide them on how to handle these children while at school. It is necessary to increase the awareness level of preschool teachers so they can properly assess students who are showing signs of autism. Understanding the spectrum of the disease is a better start in addressing the lack of knowledge among teachers.

LIMITATIONS

We were not able to recruit a sufficient number of participants, which could be due to the COVID 19 pandemic and online teaching in kindergartens, and the questionnaire was distributed through an online survey tool named Google Forms, which affects the number of respondents, as online surveys might have a low response rate. We got

Table 2. Assessment of Teachers' Awareness toward ASD Using AKQ (n=164)

Statement	Correct answer N (%)
1. Autism disorder can be diagnosed through behavioral observation	140 (85.4%)
2. Behavioral intervention is considered the most effective treatment method of Autism	132 (80.5%)
3. Children with Autism demonstrate stereotypical behaviors like fluttering	131 (79.9%)
4. Children with Autism do not make any visual communication during a conversation with others	126 (76.8%)
5. Children with Autism usually manifest special abilities like drawing and facts and figures remembering	125 (76.2%)
6. The majority of children with Autism are female †	112 (68.3%)
7. In many cases, the cause of autism disorder is unknown	111 (67.7%)
8. If a particular method of treatment achieved effective results with some children with Autism, then it is necessarily effective with all children with Autism †	107 (65.2%)
9. Children with Autism behave better only in organized educational environments	106 (64.6%)
10. Autistic children prefer routine activities	102 (62.2%)
11. Autism disorder is usually diagnosed during the first three years of the child's age	101 (61.6%)
12. Children with Autism frequently repeat the talk they hear	100 (61.0%)
13. Vaccine can cause Autism †	100 (61.0%)
14. Some autistic children have high or low sensitivity of visual, auditory, tactile, or olfactory stimuli	99 (60.4%)
15. Behavioral patterns in children with Autism are similar	89 (54.3%)
16. Genetic factors play an important role as a cause of autism disorder	85 (51.8%)
17. Children must exhibit impaired social interaction and language communication to be diagnosed with Autism	77 (47.0%)
18. Some children with Autism demonstrate inconsistency in motor skills	74 (45.1%)
19. Most autistic children have problems with imaginary playing	68 (41.5%)
20. We can diagnose autism disorder depending on physical features †	63 (38.4%)
21. Autism is a developmental disorder	61 (37.2%)
22. Most autistic children do not talk †	60 (36.6%)
23. Poor parenting practices can cause autism disorder †	46 (28.0%)
24. A child with Autism appears like a deaf †	45 (27.4%)
25. Autism could be associated with Epilepsy	41 (25.0%)
26. Generally, children with Autism understand the feelings and emotions of others †	37 (22.6%)
27. Autism disorder is diagnosed by medical methods †	29 (17.7%)
28. Most children with Autism have an intellectual disability	28 (17.1%)
29. Children with Autism tend to be auditory learners †	26 (15.9%)
30. Medication can alleviate the core symptoms of autism disorder †	17 (10.4%)
31. With proper intervention, most children with autism disorder will eventually "outgrow" the disorder †	16 (09.8%)
32. Use of electronic devices e.g. (smart phones, Ipad, T.V.) can cause autism †	14 (08.5%)
Awareness Total Score (mean ± SD)	**15.0 ± 4.97**
Level of Awareness	
• Poor	122 (74.4%)

Statement	Correct answer N (%)
• Good	42 (25.6%)

† Indicates negative question.

Table 3. Relationship between the Level of Awareness and the Socio-demographic Characteristics of the Pre-School Teachers (n=164)

Factor	Level of Awareness		X2	P-value §
	Poor N (%) (n=114)	Good N (%) (n=50)		
Age Group				
• ≤40 years	83 (72.8%)	35 (70.0%)	0.136	0.713
• >40 years	31 (27.2%)	15 (30.0%)		
Living Governorate				
• Inside Buraidah	56 (49.1%)	26 (52.0%)	0.115	0.734
• Outside Buraidah	58 (50.9%)	24 (48.0%)		
Position				
• Teacher	95 (83.3%)	48 (96.0%)	4.511	**0.034** **
• Administrator	18 (15.8%)	02 (04.0%)		
Educational Level				
• Diploma	18 (15.8%)	09 (18.0%)	0.123	0.725
• Bachelor degree or higher	96 (84.2%)	41 (82.0%)		
Teaching Experience				
• <5 years	33 (28.9%)	13 (26.0%)		
• 5 - 10 years	46 (40.4%)	20 (40.0%)	0.228	0.892
• >10 years	35 (30.7%)	17 (34.0%)		
Contact with Students with Autism				
• Yes	23 (20.2%)	19 (38.0%)	5.796	**0.016** **
• No	91 (79.8%)	31 (62.0%)		

§ P-value has been calculated using Chi-square test.

** Significant at p<0.05 level.

only 164 answers from the total sample 257 (response rate 63.8%), which may affect the generalizability of study findings.

CONCLUSION

The awareness of preschool teachers regarding ASD was deficient. Teachers who are in contact with autistic students demonstrated better knowledge than the rest of the preschool teachers. There is a need to increase the awareness of preschool teachers toward ASD. Education and training about the spectrum of the disorder can lead to better knowledge among the teachers. Early identification of children showing signs of ASD is necessary in order to provide early intervention and management. Teachers had a vital role in determining a child with ASD. Thus, their understanding of the condition is completely beneficial. Further research is recommended involving a bigger sample population to obtain more insight into the spectrum of this disease among young ones.

ACKNOWLEDGMENT

None.

AUTHORS CONTRIBUTIONS

AAS: contributes to the conception, design of the work, and revising it critically for important intellectual content

EA: contributes to the acquisition, analysis, interpretation of data and drafting the work

All authors approved the final version of this manuscript to be published and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

None.

FUNDING

None.

REFERENCES

1. American Psychiatric Association. Autism spectrum disorder. https://www.psychiatry.org/patients-families/autism/what-is-autism-spectrum-disorder

2. Black DW, Andreasen NC. *Introductory Textbook of Psychiatry*. American Psychiatric Publishing; 2014.

3. Medline Plus. Autism Spectrum Disorder. http://www.nlm.nih.gov/medlineplus/autism.html

4. World Health Organization. Autism spectrum disorders. https://www.who.int/news-room/fact-sheets/detail/autism-spectrum-disorders

5. Centers for Disease Control and Prevention. Data & Statistics on Autism Spectrum Disorder. https://www.cdc.gov/ncbddd/autism/data.html

6. Qiu S, Lu Y, Li Y, et al. Prevalence of autism spectrum disorder in Asia: A systematic review and meta-analysis. *Psychiatry Res*. 2020;284:112679. doi:10.1016/j.psychres.2019.112679

7. Salhia HO, Al-Nasser LA, Taher LS, Al-Khathaami AM, El-Metwally AA. Systemic review of the epidemiology of autism in Arab Gulf countries. *Neurosciences (Riyadh)*. 2014;19(4):291-296.

8. Sabbagh HJ, Al-Jabri BA, Alsulami MA, Hashem LA, Aljubour AA, Alamoudi RA. Prevalence and characteristics of autistic children attending autism centres in 2 major cities in Saudi Arabia: A cross-sectional study. *Saudi Med J*. 2021;42(4):419-427. doi:10.15537/smj.2021.42.4.20200630

9. Ministry of Health. World Autism Awareness Day. https://www.moh.gov.sa/en/HealthAwareness/healthDay/2020/Pages/HealthDay-2020-04-02.aspx

10. Fombonne E. Epidemiological controversies in autism. *Swiss Arch Neurol Psychiatr Psychother*. Published online January 28, 2020. doi:10.4414/sanp.2020.03084

11. Granader Y, Wallace GL, Hardy KK, et al. Characterizing the factor structure of parent reported executive function in autism spectrum disorders: the impact of cognitive inflexibility. *J Autism Dev Disord*. 2014;44(12):3056-3062. doi:10.1007/s10803-014-2169-8

12. Mohammed Taresh S, Aniza Ahmad N, Roslan S, Ma'rof AM, Mohammed Zaid S. Mainstream Preschool Teachers' Skills at Identifying and Referring Children with Autism Spectrum Disorder (ASD). *Int J Environ Res Public Health*. 2020;17(12):4284. doi:10.3390/ijerph17124284

13. Simpson RL. Evidence-Based Practices and Students With Autism Spectrum Disorders. *Focus Autism Other Dev Disabl*. 2005;20(3):140-149. doi:10.1177/10883576050200030201

14. Centers for Disease Control and Prevention. Early Intervention and Education for Autism Spectrum Disorder - A Closer Look. https://www.cdc.gov/ncbddd/actearly/autism/case-modules/early-intervention/03-closer-look.html

15. Alharbi KA, Alharbi AA, Al-Thunayyan FS, et al. School's Teachers Knowledge About Autism in Al-Badayacity, Al-Qassim Region, Kingdom of Saudi Arabia. *Mater Sociomed*. 2019;31(1):4-9. doi:10.5455/msm.2019.31.4-9

16. Drucker PF. *The New Realities: In Government and Politics, in Economics and Business, in Society and World View*. Publishers; 1989.

17. Haimour AI, Obaidat YF. School Teachers' Knowledge about Autism in Saudi Arabia. *World Journal of Education*. 2013;3:45-56.

18. Taresh SM, Ahmad NA, Roslan S, Ma'rof AM. Preschool Teachers' Beliefs towards Children with Autism Spectrum Disorder (ASD) in Yemen. *Children (Basel)*. 2020;7(10):170. doi:10.3390/children7100170

19. Al-Sharbati MM, Al-Farsi YM, Ouhtit A, et al. Awareness about autism among school teachers in Oman: a cross-sectional study. *Autism*. 2015;19(1):6-13. doi:10.1177/1362361313508025

20. Aldoori N, Saleh M. Kindergartens Teachers Early Detection Knowledge about Autism Spectrum Disorder in Babylon Province. *International Journal of Psychosocial Rehabilitation*. 2020;24(4):7258-7266. doi:10.37200/ijpr/v24i4/pr2020540

21. Liu Y, Li J, Zheng Q, et al. Knowledge, attitudes, and perceptions of autism spectrum disorder in a stratified sampling of preschool teachers in China. *BMC Psychiatry*. 2016;16:142. doi:10.1186/s12888-016-0845-2

22. Shetty A, Rai BS. Awareness and Knowledge of Autism Spectrum Disorders among Primary School Teachers in India. *International Journal of Health Sciences and Research*. 2014;4:80-85.

23. Paul N, Gabriel-Brisibe C. Awareness of autism amongst primary school teachers in Yenagoa city, Bayelsa State. *Niger J Paediatr*. 2015;42(1):46-50. doi:10.4314/njp.v42i1.10

24. Jehan I, Ayub A, Naeem B, et al. Knowledge and Perception Regarding Autism among Primary School Teachers: A Cross-sectional Survey from Pakistan, South Asia. *Indian J Community Med*. 2017;42(3):177-179. doi:10.4103/ijcm.ijcm_121_16

25. Gómez-Marí I, Sanz-Cervera P, Tárraga-Mínguez R. Teachers' Knowledge Regarding Autism Spectrum Disorder (ASD): A Systematic Review. *Sustainability*. 2021;13(9):5097. doi:10.3390/su13095097

26. Centers for Disease Control and Prevention. StatCalc: Statistical Calculators. https://www.cdc.gov/epiinfo/user-guide/statcalc/statcalcintro.html

27. Ministry of Education. Statistics of Qassim schools' education. http://www.qassimedu.com/school/

28. Arif MM, Niazy A, Hassan B, Ahmed F. Awareness of autism in primary school teachers. *Autism Res Treat*. 2013;2013(961595):1-5. doi:10.1155/2013/961595

29. Omolayo B, Auta M, Akinyemi E, Dennis U. Knowledge and Awareness of Autism Spectrum Disorder Among Teachers in Ekiti State, Nigeria. *African Journal of Teacher Education*. 2020;9(2):43-61. doi:10.21083/ajote.v9i2.6240