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ORIGINAL PAPER

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School's Teachers Knowledge About Autism in Al-Badayacity, Al-Qassim Region, Kingdom of Saudi Arabia

Khalid Ali Alharbi¹, Abdulmajeed Abdullah Alharbi¹, Faris Saleh Al-Thunayyan¹, Khalid Abdullah Alsuhaibani¹, Najeeb Saleh Alsalameh², Mohammed Hasan Alhomaïd³, Ibrahim Saleh Albahouth⁴, Pousette Farouk Hamid⁵

¹College of Medicine, Qassim University, Saudi Arabia

²ALamal Mental Complex, Saudi Arabia

³Psychiatry Department, College of Medicine, Qassim University, Saudi Arabia

⁴King Khalid University Hospitals, Psychiatry Resident, Saudi Arabia

⁵Ain Shams University, Egypt

Corresponding author: Khalid Ali Alharbi. College of Medicine, Qassim University, Saudi Arabia. E-mail: khalidabuharby@gmail.com.

ABSTRACT

Introduction: The growing number of students with Autism will set challenge to school teachers to become better prepared to take the necessary action to serve and to assist children with autism. **Aim:** The aim in this study was to assess the knowledge and attitude of school teachers regarding Autism Spectrum Disorder in Badaya city of Al-Qassim region, kingdom of Saudi Arabia, and to find out any differences in school teachers knowledge based on (gender, educational level, experience, contact with students with autism, type of school). **Methods:** a cross sectional study was conducted in Badaya City on school teachers from December 2017 until March 2018 to assess their knowledge about Autism spectrum disorder. Autism knowledge Questionnaire was completed by 248 school teachers participated in the research study, data was collected from answers of the 30 questions of the questionnaire for all participants, and analyzed using SPSS version 21. **Results:** total level of knowledge in our sample of school teachers was 48.7%, a statistical significant differences between school teachers' knowledge based on type of school, contact with children with autism favoring public schools p value=0.00, and previous contact with students with autism p value=0.03 which have higher level of knowledge. Educational level, grade of teaching, experience, gender did not significantly affect teachers' knowledge. **Conclusion:** School teachers had a weak level of knowledge about Autism Spectrum disorder. Previous contact with students with autism definitely raises level of knowledge.

Keywords: Autism, Knowledge, School teachers, Contact, Qassim.

1. INTRODUCTION

Autism Spectrum Disorders (ASD) are life-long disorders characterized by impair verbal and nonverbal communication, impaired socialization and repetitive patterns of behavior and restricted interests (1). Evidence suggests that origin is maybe gene-environment interaction or likely caused by genetic, although the causes of ASD are unknown.

ASDs become a serious health concerns because of the increase in number of prevalence in developed countries lead to obligate resources to identify the related risk factors and to assess the prevalence and prevention (2). The prevalence of autism is variable; Europe reported a median of 18.75 per 10,000, and the USA reported a median of 21.6 per 10,000. However, China reported a lower median of 11.6 per 10,000. Similarly, the male to female case ratio ranged from 1.33:1 to 16:1.1 (3). A Research was conducted using the electronic library of King Saud Bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia to find out epidemiology of Autism in Gulf countries (Saudi Arabia, UAE, Kuwait, Bahrain, Qatar, Oman), and they found that epidemiological research into autism in the GCC is relatively new, and the burden of autism in this part of the world is still unclear, however they concluded that consanguinity and multiparity is common. Prevalence of ASD was 1.4 per 10,000 in Oman, and 29 per 10,000 in UAE, and 4.3 per 10,000 in Bahrain (4) Male gender and history of developmental delay were significantly associated with autism prevalence. Consanguinity was present in 28.6% of Saudi patients, and behavioral problems such as hyperactivity or aggression were evident in 45% of patients (5)

Significant number of students in schools are affected with autism. Unique characteristics of learning are well documented for these students and are widely differ from other learners, requiring teachers to have specialized skills and challenged them to prepare very well to help serve students with autism both socially and in teaching (6). School teachers have to become aware of Autism spectrum disorder criteria, to take the necessary action to assess students with autism and to meet the needs the growing number of them.

First step in serving and supporting students with autism is the awareness. Proper comprehension of children's need, especially autistic ones is obligatory, and learning about its nature is a must. School's teachers, have the ability to affect the instructions of students with autism and to change the practice within the school.

Knowledge of autism or lack of knowledge between the educators could greatly affect both of the students and the tools that provide an appropriate education for students. Information that can create a change either by making an individual capable of different or more effective action or by creating grounds for an action are due to the knowledge which held by the teachers (7). Because of the psychologically less-developed children services in Saudi Arabia certainly hide the burden of extent of Autism spectrum disorder and other important psychiatric comorbidities among Saudi children, and this too can explain the high number of dropped cases in Saudi Arabia.

School teacher's knowledge about ASD criteria is important to determine if child had Autism and to help him in providing more care and transfer to the particular center who can better handle with these people. However many teachers lack knowledge, sufficient awareness, and understanding of Autism to meet the requirements of these students in the public schools. Little is known about the factors associated with understanding, knowledge and awareness of autism among school teachers (8, 9).

Some efforts have been made to assess the knowledge base about autism of teachers and other educational professionals. For example, found that teachers held incorrect beliefs particularly in the area of cognition about the students with autism when compared to Autism specialists. Now widely believed that teacher qualities have an important impact on student achievement (10).

2. AIM

* To assess and measure the knowledge and attitude of school teachers regarding ASDs in Badaya city of Al-Qassim region, kingdom of Saudi Arabia.

* To find out if there are any significant differences in schools teachers' knowledge about autism rely on different variable like teacher position (special or general education), teacher gender (female or male), teaching experience (less than 5 years, 5-10 years, more than 11 years), teacher education level (bachelor's degree and below or master's degree and above) and contact with students with Autism.

3. METHODS

A cross-sectional study was conducted in the period from December 2017 until March 2018 among School's teachers both genders in Badaya city, Qassim region in KSA to determine teachers knowledge about Autism.

The questionnaire was administered to 248 teachers (155 of them are female and 93 male) work in both public and private schools in Al Badaya city in Qassim region, Kingdom of Saudi Arabia were invited to participate in this research study. The *Autism knowledge Questionnaire* (AKQ) were asked to be completed by the participating teachers to assess their level of knowledge about autism. The exclusion criteria were School's teachers out of Badaya city. To obtain permission for conducting this study, we contacted school administrator in Al Badaya city.

Data were collected using questionnaires that contained two sections. First section is sociodemographic information (gender, education level, position, teaching experience) and other question about communication or previous experiences with individuals with Autism. The second section, The Autism knowledge Questionnaire (AKQ), contains 30 items submitted to measure teacher's knowledge of Autism. Questionnaire mainly measure and assess the knowledge of general information about how those students work with Autism disorder and about the characteristics of students with Autism. Knowledge items were adapted from (11-13).

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. The clarity of current survey questionnaire was verified by eight professor who were trained in special education.

Permission was obtained from relevant school administrators to conduct this study with school teachers.

Analysis of Data was conducted in this study using SPSS version 21. Parametric tests were used to find out total level of knowledge in our school teachers about autism spectrum disorder. Data were numerically coded. Analysis of the categorical data was done using mean, standard deviation. Age was presented by range (mean \pm SD). Knowledge were analyzed for the 30 questions by coding of the three responses (answer yes=score 1, answer No= score 2, answer I don't know= score 3). Responses of the study sample members were calculated by extracting the (percentage and mean) of the correct responses for each member of the sample on the *Autism knowledge Questionnaire* (AKQ). Higher means denotes better level of knowledge in our sample teachers. Reliability and internal consistency of the questionnaire was confirmed as Cronbach's Alpha is 0.900.

Independent t-test and One-way ANOVA was run to find out comparisons of means between school teachers' knowledge according to their Gender, education level, grade of teaching, type of school, contact with students with autism and teachers experience. Post-hoc test was done and Scheffe test was chosen to compare means between 3 categorical variables. p value is considered significant when <0.05 at 95% confidence interval. All available data were included in the study, with no missing cases.

4. RESULTS

This cross-sectional study was done on 248 school teachers of age mean $38.25 \pm$ SD 7.40 to assess their knowledge about Autism disorder among school children. Descriptive demographic statistical analysis was done and revealed that females ratio (62.5%), males (37.5%). Public school (89.5%), private schools (10.5%). Educational level was assessed for all participant and showed that those with Bachelor degree

	N	Min	Max	Mean	Std. Deviation
no of correct answers	30	27.00	203.00	120.9000	43.38787
percent of correct answers	30	10.90	81.90	48.7467	17.49240
Valid N (listwise)	30				

Table 1. Descriptive statistics of correct answers of (Autism Knowledge Questionnaire), total number of school teachers=248. Total level of knowledge in our school teachers: 48.7%

		Levene's Test for Equality of Variances			t-test for Equality of Means					
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Is the school public or private	Equal variances assumed	84.066	.000	3.842	246	.000	.151	.039	.073	.228
	Equal variances not assumed			4.775	191.650	.000	.151	.032	.088	.213

Table 2. T-test for type of school : public/ private Statistical significance difference was shown between 2 different types of schools public and private ones with p value < 0.05 at 95% confidence interval. School type affect knowledge of teachers, in our study public schools shows higher means of correct answers which is attributed to unequal school sizes.

are 83.1%, diploma 14.5%, Masters 2.4%. Grade level of teaching showed that upper elementary class teachers are 31.9%, lower elementary class teachers are 46.8%, those teachers for kindergarten are 21.4%. teaching experience (less than 5 years 14.1%), from 5-10 years (42.3%), more than 10 years (43.5%). Number of school teachers had previous contact with students with autism are 31.9%, and those don't have contact are 68.1%.

Knowledge of school teachers

Total level of knowledge in our school teachers: 48.7% (Figure 1), mean number of correct answers 120.9 (Table 1). Moreover, means and standard deviations for responses of school teachers on each item of the questionnaire and for the whole level of knowledge were extracted.

Differences between school teachers' knowledge

The second aim of this research was to investigate the potential differences in school teachers' knowledge about the Autism with respect to teachers' gender, type of school public or private, educational level: Bachelor degree, Diploma, Masters), Grade of teaching of school teachers: upper elementary, lower elementary, or kindergarten, teaching experience, and previous contact with autism students. To address this aim, parametric tests were done to assess and

Dependent Variable: no of correct answers			
contact with students with Autism	Mean	Std. Deviat	N
Yes	158.0000	38.67816	5
No	113.4800	41.00317	25
Total	120.9000	43.38787	30

Table 3. Mean, Standard deviation and mean differences between two groups of teachers those who have contact with students with Autism and those who don't

evaluate the effect of these variables on knowledge of school teachers about Autism disorder. To reach our aim we calculated Mean and standard deviation for each, independent t-test was done to compare means between 2 categories of the variables, t test was run for Gender, type of school, contact with students with autism. And revealed: no statistically significant differences were found between both types of gender female and male teachers, indicating gender of the teacher as an independent variable has nothing to do with their knowledge. Two types of school were examined and

Tests of Between-Subjects Effects					
Dependent Variable: no of correct answers					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	8258.460 ^a	1	8258.460	4.991	.034
Intercept	307089.127	1	307089.127	185.575	.000
contact with students with Autism	8258.460	1	8258.460	4.991	.034
Error	46334.240	28	1654.794		
Total	493097.000	30			
Corrected Total	54592.700	29			

R Squared = .151 (Adjusted R Squared = .121)
 Means of correct answers in school teachers who have previous contact with autism 158 correct answers more than those who didn't have contact with statistically significant difference p=0.034 < 0.05

Table 4. Comparison between school teachers having contact with autism and those didn't

showed a statistically significant difference between both types regarding level of knowledge p value=0.00: public school have higher means than private which could be attributed to unequal school sizes (Table 2). Previous contact with autism appears to affect knowledge of school teachers, where there was statistical significant difference between those who had contact with autism and acquiring more knowledge than teachers who had no contact and showed less knowledge, mean, standard deviation for these 2 groups of teachers (Table 3). Table (4) showed comparison between them and statistical significant difference p=0.034 p values < 0.05 at 95% confidence interval 2 tailed.

Other Variables (education level, grade of teaching, experience)

Analysis of variance test (one-way ANOVA) was conducted to compare between means of educational level

and revealed. No statistically significant differences between means of 3 educational levels (Bachelor, diploma, master) for the questionnaire as a whole, while there were statistically significant differences between different educational levels when tested to every single item in the study instrument. This can be extracted for questions (5, 22, 27) where p value lies < 0.05 with 95% confidence interval. Post hoc testing was conducted to find out comparisons between 3 educational levels. Schaffe test was chosen and show statistically significant difference between answers of teachers having bachelor degree, diploma, and master degree in certain questions, Masters degree was higher than bachelor in these specific questions. Mean of correct answers in Bachelor degree (49.65), mean of correct answers in diploma, Master degree (41.08, 65.3).

No statistically significant differences between grades level of teaching for the whole questionnaire p value = 0.822, However statistical significance was found with certain items of the questionnaire (q 6,13,16,25) with post hoc testing done. Grade of teaching (upper elementary, lower elementary, kindergarten) is not statistically affecting knowledge of teachers.

No statistically significant difference between different experience level means for the whole questionnaire, however it could be extracted when done to every item in the study instrument. Statistical significant differences between means of experience level for the following items (q 2, 6, 11, 17) was detected. Post hoc Shaffe test was run which showed higher level of knowledge in teachers with 5 years and 5-10 years of experience in comparison to those with more than 10 years. When testing 2 independent variables: Educational level x what grade do you teach on the effect on percent of correct answers of the whole questionnaire (level of knowledge) a statistical significant difference was detected $p=0.004 < 0.05$ with partial Eta squared 0.34 (estimation of effect size). Interaction between 2 variables affect level of knowledge significantly (Table 5).

5. DISCUSSION

It is imperative that school teachers have to obtain adequate awareness and knowledge about Autism Spectrum Disorder, for earlier intervention, appropriate education planning, and arrangement of family support services (14).

In this cross-sectional study we tried to figure out the level of knowledge of school teachers about Autism which was identified as 48.7%, which implies weak level of knowledge among them. In contrast to a second research done in Saudi Arabia in Jeddah which was 58% (15). Another researcher from Saudi Arabia tried to explore the burden of ASD in the Gulf area, by studying all published articles in Pubmed and Science direct to review the current state of knowledge of epidemiology on autism in the GCC, and make recommendations for future research (3). Another study done in Bahrain in 2013 added to the available knowledge about epidemiology of ASD showed boy: girl ratio is 4:1 (16).

Stone and Rosenbaum in 1988 found that not only weak to intermediate level of awareness and knowledge was discovered, but also teachers held incorrect beliefs about autism disorder,

Dependent Variable: percent of correct answers					
Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	3014.681a	4	753.670	3.216	.029
Intercept	25706.119	1	25706.119	109.689	.000
EducationLevel	1313.512	2	656.756	2.802	.080
What grade level do you teach	1481.627	1	1481.627	6.322	.019
Education Level * What grade level do you teach	2357.819	1	2357.819	10.061	.004
Error	5858.854	25	234.354		
Total	80160.660	30			
Corrected Total	8873.535	29			

Table 5. Statistical Analysis: General linear Univariate Model (Factors interaction)

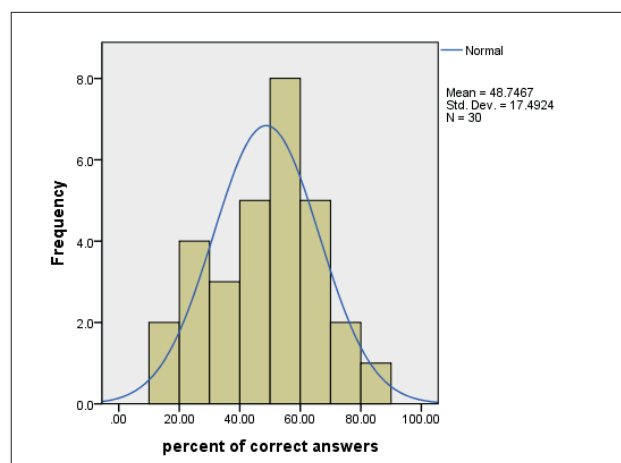


Figure 1. Knowledge level of teachers and % their corrections especially in the area of cognition. Hendricks in 2007 assessed special education teachers' knowledge and implementation of educational practices critical for the improvement of students with autism. Participants reported a low to intermediate level of knowledge (17), which raises the issue of undoubted need for training in awareness, knowledge about nature of autism, special unique characteristics and hence support strategies. A cross-sectional study was conducted to evaluate school teachers' awareness about autism spectrum disorder in an urban region in Oman. 164 teachers were randomly enrolled from five schools and showed misconceptions about autism spectrum disorder among mainstream teachers in the country as well as lack of awareness (18).

As an approach to explore potential differences between school teachers' knowledge based on other independent variables as gender, type of school (public or private), educational level, grade of teaching, years of experience, previous contact with students with autism. We have found that any differences between their knowledge were independent of their gender, as analytic statistics showed no statistically significant differences between female and male school teachers, which was consistent with most of other studies in this concern. Our study identified a statistical significant difference between public schools, and private school teachers' knowledge; However, in contrast to all other researches the mean of public school was more than private school teachers, which could be attributed

to unequal sample size (222/26). School type definitely affect level of knowledge, this result was confirmed by (15), where they emphasis on the fact that special education private school teachers had elevated level of knowledge more than public school teachers. Other researchers agreed with this result that public-school teachers were in more need for training programs regarding dealing with autism children (19).

Regarding teachers' educational level (Bachelor degree, Diploma, Masters) our results didn't find a statistical significant difference between means of the three educational level and their impact on knowledge with p value = 0.39, when examined with the questionnaire as a whole, however, when going more thorough and deep approach with every single question of the Autism Knowledge Questionnaire (30 question); A Statistically significant difference could clearly appear between Master's level which was higher than Bachelor knowledge, as well Diploma level of knowledge was higher than Bachelor level. This was confirmed by One way Anova and Post hoc Scheffe test. Haimour and Obaidat confirmed that Higher Diploma had more level of knowledge than bachelor and also, Master's degree acquiring more knowledge than bachelor.

When exploring the effect of grade of teaching on level of knowledge, there was no statistically significant difference was detected with the questionnaire, however, was extracted with some items of it, proving that grade of teaching has no effect on teachers's knowledge.

Contact with students with autism appears to have a solid correlation with the level of knowledge, this was proved in our study where school teachers have previous contact with autism children have higher statistically level of awareness and knowledge regarding autism versus who didn't. It is logic that teachers who had training courses, educational programs attendance, self readings sure acquiring richer level of information, in comparison with those who missed such experience. Other studies found same conclusion as ours (20).

Years of experience (less than 5 years, 5-10 years, more than 10 years) were evaluated as a factor affecting teachers' knowledge. In our study we didn't find a statistical significant difference between different years with p value = 0.30, however, when examined with every single question, it was clear in some questions of the questionnaire that knowledge of teachers' having 5 years of experience of teaching were clearly higher than those more than 10 years of experience. In addition those had 5-10 years are significantly different from those more than 10 years. In other studies, researchers found that teachers with 5 years of experience having more level of knowledge than those had more years of such experience, which could be explained to younger experience are still motivated, still in the career beginning, and retaining their learning, in comparison with older ones¹⁵, this was evidently proved in an Indian study (21).

Teachers did not appear to possess an adequate level of knowledge and understanding in relation to the syndrome. Continued professional development programs in the area is mandatory to update school teachers, whom they are considered important team member in autism rehabilitation programs. Arab countries have undertaken various measures to develop special education programs and services over the last three decades; nevertheless, major challenges remain regarding the expansion of these programs and services and improving their quality (22).

The strengths of this study comprise inclusion of diverse

school teachers, use of validated questionnaire. Weaknesses include a small sample size in terms of absolute numbers, however it is well accepted.

6. CONCLUSION

School teachers showed poor level of knowledge about Autism Spectrum Disorder. Public schools have higher level of knowledge, contact with children with Autism significantly affect level of knowledge. Educational level, grade of teaching, experience, gender did not significantly affect teachers' knowledge. The results of this study, therefore, signify the need for educating and training the special educators in identification and management of children with ASD as the number of children affected is growing worldwide.

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The screenshot shows the COPE website homepage. At the top, there is a dark navigation bar with the COPE logo and a search bar. Below the navigation bar, the main content area is divided into several sections:

- Promoting integrity in research and its publication:** A banner with a purple arrow pointing right that says "Need help with an issue?". Below it, text describes COPE's leadership in publication ethics and provides a link to "Read more about COPE...". There are also social media icons for Twitter and Facebook.
- Latest from COPE:** A section with tabs for "All Latest", "Latest Cases", "Latest News", and "Upcoming Events". It features a carousel of news items, including a prominent one titled "WHAT TO DO IF YOU SUSPECT SYSTEMATIC MANIPULATION OF THE PUBLICATION PROCESS" with a "New flowcharts" button.
- Our core practices:** A section with a heading and a brief description. It lists 10 core practices in a grid format, each with a checkmark icon:
 1. Allegations of misconduct
 2. Authorship and contributorship
 3. Complaints and appeals
 4. Conflicts of interest / Competing interests
 5. Data and reproducibility
 6. Ethical oversight
 7. Intellectual property
 8. Journal management
 9. Peer review processes
 10. Post-publication discussions and corrections
- Resources:** A section with a heading and a list of resources: Core Practices, Guidelines, Flowcharts, Discussion documents, and E-learning. It includes a "View all resources" button.
- Cases:** A section with a heading and a brief description of the cases database. It includes a search bar with a dropdown menu for classification and a "Search" button.
- eLearning:** A section with a heading and a brief description of the eLearning course. It includes an "Access the modules here" button.
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