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Knowledge and Associated Factors of Knowledge on Autism Spectrum Disorder Among Preschool Educators in Colombo, Sri Lanka

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Abstract

Background: Autism spectrum disorder (ASD) are increasingly prevalent condition in the modern world in which early diagnosis and commencement of therapy are shown to be effective in the management of symptoms. Preschool teachers can play an important role in the identification of children affected by ASD as symptoms start around the age of 3.

Objective: To describe the knowledge, sources of information and associated factors of knowledge on Autism Spectrum Disorder among preschool teachers in the Colombo District.

Methods: A cross-sectional descriptive study was conducted to determine the knowledge level of 211 preschool teachers, who were selected using cluster sampling, in the Colombo District, Sri Lanka. A self-administered questionnaire was distributed via a Google form. Data was analysed using SPSS software version 26.0. The significant level was set at 5%.

Results: 114 (54%) teachers had a good level of overall knowledge of ASD. The factors: Diplomas, seminars, books, workshops and training programs on ASD and other developmental disorders had shown a statistically significant association with adequate knowledge ($p<0.05$).

Conclusion: Based on the findings, it can be concluded that a significant proportion of teachers demonstrate a good overall knowledge of Autism Spectrum Disorder (ASD). These results underscore the importance of continuous professional development and targeted educational interventions for teachers to enhance their understanding and support for students with ASD in educational settings.

Introduction

Autism Spectrum Disorders (ASD) are a group of neurodevelopmental characterized by a certain degree of impaired social behaviour and language and communication skills. According to the World Health Organization (WHO), the current rate of ASD in the world is about 1 in 160. A study done by Perera et al. 2009, has found that 1 in 93 children with a prevalence of 1.07% are affected with ASD in Sri Lanka between 18 and 24 months. While the cause of ASD is not properly understood, risk factors include genetics, environmental factors like nutrition, pollution and toxins, and the male gender. Past study results have proved that there is a significant hereditary influence regarding cognitive functional defects including Autism (Folstein and Rutter 1977). Obstetric and perinatal hazards also contribute to the development of ASD, but those events are not independent and they are always associated with underlying abnormal genetic development (Bailey A et al. 1995). ASDs affect males more than females, as several sex chromosomal genes and hormonal factors may be contributing factors. Especially the testosterone hormone may cause the occurrence of the autistic phenotype. (Donna and Daniel 2013).

ASD symptoms typically appear by age two or three, worsening without proper management. Key signs include lack of eye contact, unusual speech patterns, language delays, and repetitive behaviours like stacking objects.

Contrary to myths, ASD isn't a learning disability; many individuals have above-average intelligence quotient (IQ) and excel in various subjects. Misconceptions about its causes, such as bad parenting or vaccines, have been debunked by research, showing no link between vaccinations like measles, mumps, and rubella vaccine and autism. (Taylor B et al. 2002).

The prognosis for children with ASD varies based on IQ level. Those with lower IQs may struggle to live independently, while higher-

functioning individuals may achieve independence. However, even with improvement, ASD doesn't mean complete mental health or social adaptation due to potential neuropsychiatric comorbidities post-recovery. (Helt M et al. 2008).

The onset of this developmental disability may persist since infancy (Peter Szatmari 2003) Usually, it is a lifelong disorder. While as of today there is not a definitive cure for ASD and the condition is a lifelong burden, early detection and management play a major role in creating a good quality of life for these children. Diagnosis is based on the history and analysis of behaviour. It can be done using screening methods, such as the Modified Checklist for Autism in Toddlers (MCHAT), (Baron, Allen and Gillberg 1992). Special education programs and behavioural and communication therapy have been shown to help children acquire communication and social skills and reduce the severity of symptoms. It will reduce the long-term issues, prevent worsening the symptoms and provide much time for the improvement of the well-being of the children. (Jennifer Harrison Elder et al. 2017).

Methodology

A descriptive cross-sectional study was conducted to determine the knowledge on Autism Spectrum Disorder (ASD) among preschool teachers, the sources of knowledge and the factors associated with knowledge on ASD among preschool teachers.

This study was conducted among preschool teachers in selected pre-schools in Colombo District.

Inclusion Criteria

Pre-school teachers in the Colombo District who are fluent in either Sinhala or English.

Exclusion Criteria

Pre-school teachers who do not have access to internet facilities.

Sample size - 239

Sampling Technique:

Ethical clearance for the study was obtained from the ethics review committee of the Faculty of Medical Sciences, University of Sri Jayewardenepura. Further, administrative clearance was secured by the principals and/or Persons in charge of each pre-school.

A list of all the preschools (1013 in number) in the Colombo district was obtained and 55 preschools were selected from this list by simple random sampling using computer-generated random numbers. Then from each preschool, a maximum of 5 teachers were randomly selected for the study (overall the sampling technique was cluster sampling.) 240 preschool teachers were contacted and asked to take part in the study. Of these 240 teachers, 29 were excluded from the study according to the exclusion criteria and inappropriate responses. Data from 211 teachers were taken for the study.

Data from the questionnaire was entered into a single database and analysed, using SPSS software. Range checks and customs checks were performed to ensure the accuracy of data. Univariate and multivariate tables have been presented with appropriate statistical tests.

The knowledge was assessed under 3 sections: Knowledge regarding Risk Factors, Knowledge regarding Signs, Symptoms, and Identification of ASD and overall knowledge. The knowledge levels were determined as follows.

For Knowledge regarding Risk Factors, a score of 3 or higher out of 5 was considered as a good knowledge level.

Knowledge regarding Signs, Symptoms, and Identification of ASD, a score of 15 or higher out of 22 was considered as a good knowledge level.

Overall knowledge was taken as the sum of these two components of knowledge. An overall knowledge of 18 or higher out of 27 was considered a good knowledge level.

The association of each variable with the knowledge regarding risk factors of ASD, with the knowledge regarding the signs, symptoms, and features of ASD and with the overall knowledge regarding ASD were assessed using a chi-squared test for categorical variables and t-test for numerical variables.

Table 1: Total Frequency distribution of the sociodemographic factors of the study population.

Characteristic	*Responses*	*Number (n = 211)*	*Percentage*
Age group	20-29	57	27.0%
	30-39	63	29.9%
	40-49	65	30.8%
	50-59	21	10.0%
	Over 60	5	2.4%
Race	Muslim	27	12.8%
	Sinhalese	187	85.8%
	Tamil	3	1.4%
Religion	Buddhist	148	70.1%
	Catholic/Christian	35	16.6%
	Hindu	1	0.5%
	Islam	27	12.8%
Marital status	Divorced	4	1.9%
	Married	168	79.6%
	Unmarried	36	17.1%
	Widowed	3	1.4%
Number of children (if any)	0	71	33.6%
	1	53	25.1%
	2 to 3	86	40.8%
	More than 3	1	0.5%
Highest achieved Educational Level	A/L	12	5.7%
	Diploma	144	68.2%
	O/L	7	3.3%
	Other	4	1.9%
	Postgraduate	12	5.7%
	Undergraduate	32	15.2%
Are you following / completed a degree in elementary education?	No	128	60.7%
	Yes	83	39.3%

Number of years of Experience as a preschool teacher	Less than 5 years	45	21.3%
	5 to 10 years	66	31.3%
	More than 10 years	100	47.4%
How many students are there in your class?	Less than 10	24	11.4%
	10 to 30	153	72.5%
	More than 30	34	16.1%

Results

Sociodemographic and teaching experience-related factors of the study population.

Considering the age groups of the participants, the majority (30.8%) of the preschool teachers were in the "40 - 49" years category, 187 (85.8%.) teachers were Sinhalese and 148 (70.1%) were Buddhists, 168 (79.6%) were married, 140 (66.4 %) had children.

The highest achieved educational level of most of the teachers was a diploma (68.2%). Out of the study sample, only 39.3% of the teachers stated that they are following or completed a degree in elementary education. The majority of the teachers (52.6%) had less than 10 years of experience as a preschool teacher. The majority of the teachers (72.5%) stated that there are 10–30 students in their class.

We decided to disregard gender as a variable as out of 211 participants, 209 (99.05%) of them were female, 1 (0.47%) was male and 1 (0.47%) preferred not to state the gender. Since the counts of the "Male" and "Prefer not to say" are negligible compared to the count for "Female", this variable was removed from the study.

Table 2: Frequency distribution of knowledge levels on Autism Spectrum Disorder.

Characteristic	***Responses***	***Number (n = 211)***	***Percentage***
Total Score Groups	Good Knowledge level (more than 18 out of 27)	114	54.0%
	Poor Knowledge level (18 or less out of 27)	97	46.0%
Knowledge of Risk Factors of ASD Score Groups	Good Knowledge level (more than 2 out of 5)	97	46.0%
	Poor Knowledge level (2 or less out of 5)	114	54.0%
Knowledge of Signs, Symptoms, and Identification of ASD	Good Knowledge level (more than 14 out of 22)	176	83.4%

Score Groups	Poor Knowledge level (14 or less out of 22)	35	16.6%

Knowledge

Ninety seven (46%) teachers had good knowledge regarding risk factors of ASD and 176 (83.4%) had a good knowledge level regarding the signs, symptoms, and identification features of ASD.

Therefore 114 (54%) teachers had a good level of overall knowledge on ASD.

Table 3: Frequency distribution of sources of information regarding ASD.

Characteristic	***Responses***	***Number (n = 211)***	***Percentage***
Diploma/course that includes developmental disorders as a component	No	127	60.2%
	Yes	84	39.8%
Seminar on ASDs	No	104	49.3%
	Yes	107	50.7%
Individual Sources of Knowledge	Electronic media	143	67.8%
	Books	106	50.2%
	Workshops and Training Programs	103	48.8%
	Other People	117	55.5%
	N.B. Each participant was able to select more than one source of knowledge, therefore the total percentages of each index of knowledge will exceed 100%		

Sources of information

Regarding sources of knowledge that preschool teachers have obtained their knowledge on ASD, most teachers are neither following nor have followed a diploma/course that includes developmental disorders as a component. However, 107 of the teachers (50.7%) of the study population have attended at least one seminar on ASD.

Regarding the individual sources of knowledge that they have gained their knowledge on ASD, electronic media is the source of knowledge for the majority for 67.8%) of teachers in this study population. While 50.2% (106) of the population gained their knowledge from books, 48.8% from workshops and training programs and 55.5% (117) from other people.

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Table 4: Association between sources of information and overall knowledge.

	Good Knowledge n (%)	*Poor Knowledge n (%)*	*Total n (%)*	*Significance*
Association between a Diploma and overall knowledge.				
Yes	57 (67.9)	27 (32.1)	84 (100)	X^2=10.745
No	57 (44.9)	70 (55.1)	127 (100)	df = 1
Total	114 (54.0)	97 (46.0)	211 (100)	p = 0.001
Association between a Seminar and overall knowledge.				
Yes	70 (65.4)	37 (34.6)	107 (100)	X^2 = 11.343
No	44 (42.3)	60 (57.7)	104 (100.0)	df = 1
Total	114 (54.0)	97 (46.0)	211 (100.0)	p = 0.001
Association between books and overall knowledge.				
Yes	69 (65.1)	37 (34.9)	106 (100)	X^2 = 10.502
No	45 (42.9)	60 (57.1)	105 (100)	df = 1
Total	114 (54.0)	97 (46.0)	211 (100)	p = 0.001
Association between workshops and training programs and overall knowledge.				
Yes	63 (61.2)	40 (38.8)	103 (100)	X^2 = 4.126
No	51 (47.2)	57 (52.8)	108 (100)	df = 1
Total	114 (54.0)	97 (46.0)	211 (100)	p = 0.042

Factors associated with the knowledge of ASD.

Teachers who have followed or are following a diploma that includes developmental disorders have a good knowledge level (67.9%) compared to the teachers who have not followed or are not following a diploma. There was a significant association (p =0.001) between following or following such a diploma and the overall knowledge regarding ASD.

In addition, more teachers who have attended a seminar on ASD had a good knowledge level (65.4%) compared to teachers who have not attended any seminar on ASD. There was a statistically significant association (p = 0.001) between having attended a seminar on ASD and overall Knowledge.

Considering overall knowledge of ASD, more teachers who have gained knowledge from books had a good knowledge level (65.1%) compared to teachers who have not used books. There was a statistically significant association (p = 0.001) between being informed of ASD through books and overall knowledge of ASD.

In addition, more teachers who have gained knowledge from workshops and training programs had a good knowledge level (61.2%) compared to teachers who have not attended workshops and training programs. There was a statistically significant association (p = 0.042) between being informed of ASD through attending workshops and training programs and overall knowledge of ASD.

Discussion

The objectives of this study were to determine the knowledge level of preschool teachers and to describe the sources of knowledge and the factors associated with this knowledge. Accordingly, a descriptive cross-sectional study was carried out with cluster sampling using a

self-administered online questionnaire. A sample size of 211 was acquired.

The Knowledge of Autism Spectrum Disorder

In this study out of 211 preschool teachers 114 (54%), teachers had a good level of overall knowledge of ASD, 94 (46%) had good knowledge regarding risk factors of ASD and 176 (83.4%) had a good knowledge level regarding the signs, symptoms, and identification features of ASD (Table 2). In comparison to this research, studies done by Lui et al (2016) in China, and Ayoka (2018) in Ghana found that preschool teachers had a low knowledge level regarding ASD and studies done by Drusch (2015) in the USA and Taresh et al (2020) in Yemen found that preschool teachers had a moderate knowledge level regarding ASD.

The33ifferrence Is the socio-demographic factors as each of the above studies was carried out in different countries. Additionally, except for the study carried out by Lui et al (2016) in China (in which the sample size was 471), the other studies had significantly lower sample sizes than ours. The unreliability of studies with low sample sizes could account for the difference in knowledge levels.

The sources of knowledge and other factors associated with the knowledge on ASD.

It was found that there is a statistically significant association between following or following a Diploma that includes developmental disorders and overall knowledge. According to the study result majority (67.90%) of teachers who have followed or followed a diploma that includes developmental disorders had a good knowledge level compared to the teachers who have not followed a diploma (42.3%) (Table 4). Similar results were found in a study carried out in Yemen by Taresh et al in 2019. They also found that teachers who had a diploma had a higher level of knowledge compared to teachers with bachelor's degrees and high school degrees.

Other than that, it was found that a significantly higher proportion of preschool teachers who had attended a seminar on ASD (65.4%) had good knowledge of ASD when compared to the preschool teachers who had not attended to seminar on ASD (42.3%) (Table 4).

So, we can suggest that following of Diploma and attending a seminar about ASD and other developmental disorders will be helpful to them to improve their knowledge of ASD leading to better identification of children with ASD.

Regarding the individual sources of knowledge that they have gained their knowledge on ASD, electronic media is the source of knowledge for the majority (67.8%) of teachers in this study population. 50.2% (106) of the population gained their knowledge from books, 48.8% from workshops and training programs and 55.5% (117) from other people (Table 3). Electronic media was the most popular source of information. A similar result was obtained in a study carried out by Arif et al. 2013 in Pakistan where 55.3% of the teachers used electronic media as a source of information.

Books and workshops/training programs as sources of information on ASD showed statistically significant associations with overall knowledge. (Table 4). According to the above results, we can assume that there is a significant probability of gaining knowledge from books and workshops/training programs about ASD.

While electronic media (Television, radio and the internet) was the most popular source of information there was no significant association between electronic media as a source of knowledge and the overall knowledge level.

So, we can conclude that electronic media is an ineffective medium of educating people when compared to books, seminars, workshops, and training programs. One significant reason for this perception could be the challenge of distinguishing reliable sources from unreliable ones in electronic media platforms. This difficulty may undermine the credibility and educational impact of information disseminated through electronic media channels.

In our study, statistically significant associations were not found between sociodemographic factors and overall knowledge.

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Abbreviations

ASD – Autism Spectrum Disorder

IQ – Intelligence Quotient

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Keywords

Autism, Autism Spectrum Disorder, Preschool teachers.

Conflict of Interest

No potential conflicts of interest were reported by the authors.