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## Knowledge among Pre-Service Special Education Teachers in North Malaysia Regarding the Development of Autism Spectrum Disorder (ASD) Children

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### Abstract

The Centers for Disease Control (CDC) estimated the autism spectrum disorder (ASD) prevalence to be 1 in 59 individuals (CDC, 2018). With the increase in diagnosis of ASD comes the awareness of the unique needs of individuals with an ASD. Yet colleges of education rarely have an Autism specialization within their special education teacher preparation programs. Even though many students with ASD are served in the general education environment (Malaysia Special Education Division, 2019), few general education teachers receive any training for evidence-based practices for students with ASD. To better understand the current state of knowledge of ASD among special education teachers in training in North Malaysia, we surveyed knowledge and attitudes of special education teachers in training in north Malaysia regarding the disorder. 54 of 3rd year special education teachers in training in a teacher training institute in north Malaysia completed questionnaires assessing participant demographics, knowledge of typical child development and knowledge of ASD. Overall, the level of knowledge of ASD was moderate for the respondents in this research based on knowledge test and self-evaluation. Inferential statistics showed demographic factors i.e., gender, level of education, school location and etc did not affect the knowledge about ASD. Majority of the respondents raised the needs of special training involving teaching strategy for ASD students.

**Keywords:** Autism Spectrum Disorder (ASD), Teacher Training Institute, Pre-Service Teacher, Special Education Teacher.

### Introduction

Autism Spectrum Disorder (ASD) is a neurological developmental disorder characterized by persistent difficulty in social communication and social interaction, and limited and repetitive patterns of behavior, interests, or activities (American Psychiatric Association, & American Psychiatric Association, 2013). For 2014, the overall prevalence of ASD among the 11 Autism and Developmental Disabilities Monitoring websites was 16.8 per 1,000 (one in 59) of 8-year-

old children. Overall estimates of ASD prevalence Asia, in males (0.45 %, 95 % CI: 0.19–1.04 %) was higher than that in females (0.18 %, 95 % CI: 0.079–0.49 %) (Qiu et al., 2020) while recent by Kogan et al (2018) indicated that the prevalence of ASD in children has been documented by epidemiology studies to be increasing significantly across Europe, North America, and some countries in Asia. The steady rise in the prevalence of ASD in these nations is largely attributed to certain factors that have been put in place by their respective governments (Hinbest & Chmiliar, 2021).

Supporting an individual with ASD is largely similar in the US and the UK (i.e., \$2.4 million and \$2.2 million for an individual with ASD and intellectual disability, and \$1.4 million and \$1.4 million for an individual with ASD) without intellectual disability (Rogge & Janssen, 2019). This large economic burden represents a wide range of direct and indirect costs, from medical treatment to special education to the effects of lost productivity among parents (Ou et al., 2015). However, The ABA program was very effective in improving intellectual abilities; moderately to very effective in improving communication skills and expressive and receptive language skills; moderately effective in improving IQ scores based on non-verbal tests, adaptive behavior (for the total sample), socialization, and receptive language skills (Makrygianni et al. 2018). Therefore, diagnosis at a young age plays an important role in the prognosis and outcome of development. Several trends have helped the diagnostic process. As the prevalence of the disease has significantly increased, researchers have examined several factors that could be contributing to it. Among the contributing factors are increased awareness of ASD, expansion of diagnostic criteria, early assessment and service availability, cultural and environmental factors, and improved research techniques (Weir, 2021).

Unlike other developed countries, awareness of autism issues in terms of education, health, services, welfare, facilities etc. has only just begun in Malaysia (Ilias et al., 2019), pre-service teachers show inaccurate perceptions of etiology disability and intervention options (Kisbu-Sakarya & Doenyas, 2021). According to the Centers for Disease Control in the United States, the incidence of autism is 1 in 68 children. This means that about 9,000 children in Malaysia are born with autism each year (Jamidin et al., 2019). In Malaysia, there is no official registration for the number of individuals diagnosed with autism (Rohani et al., 2018). The only statistic that explains some of the incidence of autism in Malaysia is a local survey conducted in 2008 which showed that there was one in 625 children with autism (Basri & Hashim, 2019), indicating a lack of diagnosis, possibly due to low levels of awareness. among the general population.

In conclusion, this indicates an urgent need to raise awareness about ASD in Malaysia. One of the community groups with the most pressing awareness needs is teachers. Malaysian global policies and initiatives place great emphasis on the teaching of children with special needs in the regular classroom (Chu et al., 2021). Thus, apart from parents and guardians, teachers are the group that works most closely with children and adolescents with ASD. Teachers have been the focus of recent research on knowledge and attitudes toward ASD (Low et al., 2018). However, most of this research was collected among primary and secondary school teachers, while less attention was given to knowledge of pre-service teachers (Sanz-Cervera et al., 2017), and overall, little such research was conducted in Malaysia. Not only is there an increase in the number of children with ASD enrolled in

mainstream programs, but educational programs for children with ASD are often beneficial when initiated at a younger age (Wang et al., 2012).

In the current study, we have adapted the survey method from the study by Liu et al (2016) who assessed preschool teachers' knowledge of ASD in China with psychometric properties confirmed in a pilot study. A previous pilot study used general practitioners (Huang et al., 2013), and generally found a broader knowledge of typical child development than knowledge of atypical development manifested in disabilities such as ASD and attention disorders, knowledge unrelated to the age or gender of the participants. Our research focused on the knowledge possessed by special education pre-service teachers about the development of children with ASD.

### **Research Objective**

Assess the level of knowledge of educator students about the development of children with ASD.

### **Research Questions**

1. What is the level of knowledge of pre-service teachers about the development of children with ASD?
2. Are there significant differences in the level of knowledge about the development of children with ASD by gender, year of school, highest level of education and interaction with students with ASD?
3. Are there significant differences in the level of knowledge about the development of children with ASD with teaching experience and school location?
4. What is the level of knowledge of pre-service teachers about the development of children with ASD based on their self-assessment?
5. What is the opinion of pre-service teachers on the need for training of teaching strategies of ASD students?

### **Methodology**

#### **Respondents**

Ethical approval has been obtained by the Department of Special Education; Institute of Teacher Education Campus A. Notice of consent was obtained prior to study participation. Special education teachers in training free to participate and be told that refusal to participate at all will not affect their educational status in college training institutions. A total of 54 special education preservice teachers in training completed the survey for analysis; this represents a 100% response rate.

#### **Assessment Steps**

All items of the questionnaire were adapted to the Malaysian cultural context from the measures used in a previous study that assessed awareness of ASD. Questionnaires that assess knowledge on ASD using the content of items from previous studies (Kogan et al., 2009) made for this purpose, and these previous studies generally used pilot studies to ensure item clarity and adequate psychometric properties. The questionnaire assessed 1) knowledge of special child development, 2) level of self-assessment related to knowledge of ASD and 3) specific training needs related teaching strategies of individual children with ASD and adapted from a study of special education teachers in China by Liu et al. (2016). Liu et al. (2016)

designed questionnaire items and performed pilot study in a sample of medical practitioners (general practitioners).

### **Demographics of Study Respondents**

Study respondents completed a questionnaire that took their demographic information such as

age, gender, educational experience, previous experience working with children with special needs, and their areas of experience (urban, suburban, and rural areas).

### **Knowledge of the Development of Children with ASD**

A questionnaire consisting of 8 true / false statements about ASD was given. Example items which included, 'A child with autism has a high level of visual acceptance which is better than auditory reception.' [correct response = true] and, 'Children with autism typically grow up to be adults with schizophrenia' [correct response = false]. One point is awarded for each correct answer. Following the methodology used by Liu et al. (2016), participants were designated as 'passing' the measure if they gave the correct response to more than 50% of items.

### **Findings and Discussion**

#### **Findings**

Descriptive analysis was performed for each item in the questionnaire. According to the criteria

set by Lian et al. (2008), study respondents considered passing the knowledge test when obtained a score above 50%. Inferential analysis i.e. t test was performed to compare the scores between the two groups involved gender, level of education, year of study, close interaction with children autism. In addition, one -way analysis of variance (ANOVA) was performed to see if there were significant differences in knowledge between several groups based on demographic factors such as experience and school location. The significance level was set at 0.05 for all analyzes. Data obtained analyzed using Statistical Package for the Social Sciences (SPSS) version 26.0.

### **Demographics of Study Respondents**

The study involved 54 students in the field of special education at the Institute of Teacher Education in northern Malaysia with 100% responsive rate; of which 61.1% were female students. Though only a small number of respondents (18.5%) had close interactions with autistic children, yet most respondents (98.1%) were exposed to the teaching of autistic students in the classroom.

**Table 1. Demographic Data of Study Respondents**

Demographic Factor	N	Percentage
Gender		
Male	21	38.9
Female	33	61.1
Highest Level of Education		
Sijil Pelajaran Malaysia (SPM)	53	98.1
Sijil Tinggi Pelajaran Malaysia (STPM)	1	1.9
Years of study		
3 <sup>rd</sup> year	49	90.7
4 <sup>th</sup> year	5	9.3
Teaching Experience		
Typical students	52	96.3
ASD students	53	98.1
School Location		
Rural	17	31.5
Suburbs	17	31.5
City	20	37.0
Close interaction with children with ASD	10	18.5

### Pre-service Teachers' Knowledge of the Development of ASD Children

The average score for special education pre-service teachers' knowledge of the development of children with ASD was 5.13. This average score exceeds 50 percent based on the criteria Lian et al. (2008) showed study respondents 'passed' in a knowledge test on children with ASD. With reference to the rubric scores in table 2, the level of knowledge of pre-service teachers related to the development of ASD children is at a moderate level.

**Table 2. Rubric of pre-service teachers' knowledge scores on the development of ASD children**

Score	Interpretation of knowledge levels
0.00 – 3.00	Low
3.01 – 6.00	Moderate
6.01 – 8.00	High

Table 3 shows the descriptive analysis of items involving teachers' knowledge of the development of ASD children in the questionnaire. Item 6 recorded a low percentage of correct answers i.e. 22.2% where an understanding of autism is curable. While item 1 showed a high percentage of correct answers that is 85.2% related to the tendency of auditory and visual acceptance of children with ASD.

**Table 3. Pre-service teachers' knowledge of child development ASD by item**

No.	Item	Answer	N (%)
1.	A child with autism has a high level of acceptance better visual than auditory reception.	True	46 (85.2)
2.	A child with autism has a high level of acceptance better visual than auditory reception.	False	24 (44.4)
3.	A child with autism has a high level of acceptance better visual than auditory reception.	False	18 (33.3)
4.	Children with autism show no social connection, even with their parents.	True	36 (66.7)
5.	The incidence of autism is less than 10% of the total population.	True	25 (46.3)
6.	Autism can be cured if identified early and undergo an appropriate intervention.	False	12 (22.2)
7.	Autism is a psychological problem.	False	30 (55.6)
8.	Children with autism can be cured if they get appropriate treatment.	False	14 (25.9)

A t test was also performed to see if there was a significant difference between the ASD knowledge score with several variables such as gender, year of study, highest level of education, interaction with ASD students. Nevertheless, all t test results indicate that nonsignificant differences in the level of knowledge of pre-service teachers based on gender ( $t = 1.975$ ,  $p > 0.005$ ), years of study ( $t = 0.184$ ,  $p > 0.05$ ), highest level of education ( $t = 1.322$ ,  $p > 0.05$ ) and interaction with students ASD ( $t = 0.149$ ,  $p > 0.05$ ).

While ANOVA test that compares ASD knowledge scores with several enablers' variables i.e. teaching experience and school location also showed no significant differences between the variables studied.

### **Self-assessment of Pre-service Teachers' Level of Knowledge Related to Autism**

At the end of the questionnaire, respondents were asked to assess their level of knowledge related to autism. A total of 49 people equivalent to 90.7% of respondents rated themselves as mastering the relevant knowledge autism in simple terms.

### **The need for specific training of teaching strategies for autistic students**

Although in general 98.1% of students have experience teaching students with ASD, but 92.6% stated that they still need specific training related to teaching strategies for autistic students.

### **Discussion**

ASD is a lifelong disability and is currently generally incurable, however can only be treated to a certain degree in certain individuals to avoid worse outcomes (Bölte, 2014). Indeed, there are claims that recovery is in a single case or a smaller group of individuals of ASD (Helt et al., 2008). For example, Fein et al. (2013) reported optimal outcomes to 34 individuals with ASD, who found that there was a loss of all ASD symptoms and functioning from the aspect of interaction and social communication like any other typical individual. However, until there is

currently no scientific evidence to suggest that ASD can be 'cured' because ASD is not a disease but an individual neurological disorder.

Understanding children with ASD is important in helping them live life with better. It is inaccurate and alarming when the results of the questionnaire show only 22.2% of the 54 pre-service teachers were able to answer item 6 questions correctly about treatable autism. The same is shown in question item 8 with respect to children suffering from autism can be cured with appropriate treatment. Only 25.9% of teachers are pre-service special education was able to answer this question correctly and the remaining 74.1% considered autism to be a treatable disease. This is in line with Kaplan (2012) who asserted that no there are effective pharmacological options based on the available evidence for treating ASD. Behavioral interventions behavior shows some evidence of improved cognitive or adaptive function in individuals with ASD.

The findings of the study showed that there was no significant difference between the level of knowledge of pre-service teachers' men and women. A study by Zainuriza et al (2019) also found that gender is not affect the level of knowledge of teachers related to ASD. However, in the study, there was a significant difference in the level of knowledge between the levels of education where the findings were not obtained in this study. This is explained by the demographic differences of the respondents where this study only involving only two levels of education compared to five levels of education in the study of (Zainuriza et al., 2019). The overall level of knowledge also showed findings that were not in line with the study that is because the study involved four categories of respondents compared to this study which only focused on pre-service teachers only.

However, the findings of this study cannot be generalized to the population of special education pre-service teachers in Malaysia given the small number of respondents. Researchers suggest that the study was conducted on a larger scale and used stratified random sampling so that the selection of study respondents was more balanced and fairer.

### **Conclusion**

In conclusion, our study supports previous findings in China in showing a lack of awareness and knowledge about ASD among the general population. This study found that special education pre-service teachers are actually aware of their lack of knowledge about ASD, and that this awareness coexists with an interest in increasing knowledge and their skills in this field. As a result, there is an urgent need to emphasize to educational programs and curricula in teacher training regardless of whether special education teachers nor mainstream teachers who focus on teaching methods for children with ASD effective and evidence-based to meet the educational needs of groups of children these special needs are growing in schools in line with the focus given by around the world on this topic (Lian, 2008).

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