

Knowledge and Perception of Autism among Primary School Teachers in Southern Nigeria: A Study on Awareness and Stigma by School Teachers in Calabar, Nigeria

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Abstract

Background: The prevalence of autism spectrum disorder is on the rise globally, but there is little awareness and sensitisation in Nigeria on its features, etiology and treatment. Primary school teachers play a vital role in early detection and treatment. However, there is little awareness and poor perception of autism among primary school teachers, thereby making early detection and treatment difficult. **Aim:** To determine the level of awareness and perception of autism among primary school teachers and their referral pathway in Calabar. **Materials and Methods:** The study was a cross-sectional study carried out on 218 primary school teachers in Calabar. A multistage sampling technique was used to recruit respondents. The Socio-Demographic Questionnaire (SDQ) and the Autism Stigma and Knowledge Questionnaire-2nd edition (ASK-Q2) were administered to the respondents. The cut-off score for ASK-Q2 was obtained using 50% classification threshold. Respondents with a total score of 50% and above were said to have good knowledge and perception of autism. The data were analysed using SPSS version 25, and the p-value was set at less than 0.05. **Results:** The mean age of the respondents was 42.67 ± 10 . The male respondents were 16.5%, while the female respondents were 83.5%. A greater percentage of the respondents (62.8%) were in public schools, with 37.2% in private schools. Social media was the highest medium through which the respondents heard about autism (47.2%). Only 27.1% of the teachers have had training in autism or contact with an autistic child. Most of the respond-

ents (83.9%) said they would refer an autistic child to the hospital. The level of awareness of autism among the respondents was 60.1%, while the level of perception was 57.3%. The predictors of knowledge of autism included age and referral pathways of the teachers. **Conclusion:** The study showed that more sensitisation and awareness need to be created in primary schools about autism and that primary school teachers need to undergo formal training in autism to increase their knowledge and perception of autism.

Keywords

Autism Spectrum Disorder, Primary School Teachers, Knowledge

1. Introduction

1.1. Study Background

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterised by difficulties in social interaction and communication, restricted interests and the presence of repetitive behaviour [1]. Studies have shown that one in every 100 children worldwide and one in every 44 children in the United States are diagnosed with Autism [1]. A study by Frances *et al.* Showed the prevalence of autism between 0.70% and 3% [2]. In a direct screening study conducted on children receiving primary health care services in Europe. 2.8% were found to be at risk of ASD [2]. In Africa, a prevalence rate of 1.7% was obtained. Studies in Nigeria showed a prevalence rate between 1.6% and 2.9% [3] [4]. Data on prevalence usually vary and depend on the study population (e.g., clinical or school-based) and the method used to estimate prevalence (direct or indirect) [5]. Autism can be diagnosed as early as 18 - 24 months of age, at which point the characteristic symptoms can be distinguished from typical development and other developmental delays or conditions [1] [5]. It can be diagnosed at the primary or even secondary school level. A study by Perez-Crespo *et al.* showed that the male-to-female ratio was found to be 4.5 to 1 [6]. Being a male with a poor socioeconomic background is a risk factor for ASD [6]. The cause of autism is unknown; however, genetic and environmental factors have been suggested. Some of the clinical symptoms of ASD include the following: socially, the child may have abnormal eye contact, gestures and mannerisms [4]. He or she may find it hard to play with their peers and is rather attached to objects; they may not speak clearly or not speak at all, may be unable to engage in pretend or imaginative play, and may want sameness in activities like drinking from the same cup every day. Ritualistic behaviours like opening and closing the doors, and may throw tantrums occasionally for no apparent reason [3] [4].

Many studies emphasise the critical role teachers play in the early detection of ASD-related difficulties in children [7]. Primary school teachers can play an essential role in diagnosis, especially in the early stages of education, because this is

the period when children have access to communication opportunities in the school environment, which can facilitate the timely recognition of autistic features [7]. Increasing teachers' awareness and knowledge enables them to identify children with ASD and refer them for proper assessment and treatment [8]. Comprehensive assessment of ASD relies on feedback from various sources, e.g., parents, teachers, caregivers and on direct observations by individuals knowledgeable about the conditions [8] [9]. Studies have shown that teachers' knowledge about ASD is generally limited and that the level depends on the stage at which they work, their previous experience and any prior contact with students with ASD [8].

A systematic review by Gomez-Mari *et al.* showed that teachers' general knowledge of autism was poor [10]. The study identified teachers' prior training and contact with students with ASD as significant factors associated with ASD awareness among teachers [10]. Another study in Türkiye showed a high awareness of ASD among teachers [5]. The study revealed that women and those with lower income had significantly higher scores on the ASD awareness scale [5]. Also, teachers who received ASD-related training or had an individual diagnosed with ASD in their environment had a higher ASD score. A Nigerian study by Omolayo *et al.* showed that 96.6% of the study participants were aware of Autism, and there was a significant relationship between knowledge of autism among the teachers with age and prior training on autism. Another study in Bayelsa State showed that the knowledge of autism among primary school teachers in the state was poor [11].

The perception of autistic children, especially in sub-Saharan countries like Nigeria differs.

Some are labelled with derogatory names by parents, teachers and their peers. [12]. Autism is easily taken for something else, as these children are passed off as academically backward, demon-possessed or suffering from some kind of parental neglect [12] [13]. They are even punished by the class teacher for their slowness and inattention in class [13]. There is also rejection from school because of their lack of emotional and academic intelligence, and teachers may find it difficult to teach them with other pupils in class. [12] [13].

The United Nations declared 2nd April as World Autism Awareness Day to propagate awareness of autism and to canvass for assistance and funds for research and intervention [14]. Awareness and increased detection of autism in the Western world are growing [11]. However, in Nigeria, there is little sensitisation to recognize neurodevelopmental disorders in pupils at any level of the country's educational system [11]. In addition, the level of preparedness of our teachers to care for the educational and psychological needs of these children is poor [8] [11]. The only specialised care given for Autistic children in Nigeria is in special needs schools [11]. These schools cater for all disabled children with little or no facilities to cater for the blind, deaf, and children with Intellectual Disability [11] [12]. It is difficult to give the needed attention to children with Autism Spectrum Disorder [11].

1.2. Justification

One of the major hindrances to understanding and determining how prevalent autism is in our environment is the low level of awareness among teachers in Nigeria. Primary school teachers play a vital role in early detection and identification of these disorders, and their knowledge is critical in the pathway to care. However, there is a paucity of studies in Nigeria on awareness and perception of autism among primary school teachers.

People have labelled children with ASD as possessed, stubborn and ill-mannered; thus they are often maltreated or neglected in school. [12]. Some schools cannot cope with their behaviours, hence making their parents change schools often for them. Also, some teachers reject autistic children in their class and refuse to attend to them [12]. All these go to buttress the poor perception of this disorder among teachers/guardian and the need to assess and educate them about the disorder. This study hopes to assess primary school teachers' perceptions of autism and educate those who have a poor perception of the disorder.

The use of the Autism Stigma and Knowledge Questionnaire 2nd edition (ASK-Q2) to assess knowledge and perception of autism among primary school teachers is unique, as there are few studies in Nigeria that have used standardized instrument to measure awareness and perception of autism among school teachers. The ASK-Q2 measures both knowledge and people's perception about Autism with strong cross-cultural validity.

1.3. Study Aim

To determine the level of awareness and perception of autism among primary school teachers and their referral pathway in Calabar.

1.4. Specific Objectives

- 1) To evaluate the knowledge of primary school teachers on Autism in Calabar.
- 2) To determine the level of perception of autism among primary school teachers in Calabar.
- 3) To evaluate the relationship between teachers' knowledge of autism in both private and public schools in Calabar.
- 4) To evaluate the relationship between teachers' years of experience and their knowledge of autism.

1.5. Study Hypotheses

There is no significant relationship between teachers' years of experience and the awareness of autism among primary school teachers in Calabar.

2. Methods

2.1. Study Design

This was a cross-sectional study among primary school teachers in Calabar me-

tropolis.

2.2. Inclusion Criteria

- 1) Primary school teachers within the two local government areas in Calabar metropolis.
- 2) Teachers who gave consent to participate in the study.
- 3) Teachers currently teaching pupils from grades 1 to 5 with at least 1 year of teaching experience.

2.3. Exclusion Criteria

- 1) Teachers who did not give consent for the study.
- 2) Primary school teachers with less than 1 year of teaching experience.

2.4. Study Instrument

The following instruments were used for the study.

2.4.1. Socio-Demographic Questionnaire (SDQ)

The SDQ consists of the Teacher's age, gender, marital status, school type, class taught, religion, and tribe. level of education, teaching experience, and questions like, 'Have you heard about autism before?' How did you know about autism? Is autism a neurodevelopmental or spiritual problem? Previous training or contact with children with autism? Will you refer an autistic child to the hospital or church?

2.4.2. Autism Stigma and Knowledge Questionnaire 2nd Edition (ASK-Q2)

The ASK-Q2 is a unique instrument for the assessment of autism stigma and knowledge with strong psychometric properties, cross-cultural utility and comprehensive content coverage and subdomains [15]. The first edition of ASK-Q is a 55-item questionnaire comprising four subscales: a) diagnosis/symptoms, b) aetiology, c) treatment, and d) stigma [15]. The ASK-Q2 still contains three subscales measuring autism knowledge, including etiology, symptoms and treatment and, one subscale assessing stigma [16]. As the original manuscript and measure version, the stigma subscale was composed of items that also load onto one of the knowledge subscales [15] [16]. In addition, these stigma items should be reverse-scored when calculating the stigma subscale score since lower scores on the stigma subscale and higher knowledge scores are ideal [16]. Each subscale has sufficient item loading: etiology-10 items, diagnosis/symptoms-15 items, treatment-10 items, and stigma-4 items [16]. The final resulting measure has 36 scorable items and one initial screening item to gauge any familiarity with ASD [16].

Using the test-retest reliability, results showed that the reliability of the classifications for the four subdomains were 0.982, 0.954, 0.984 and 0.933 [15] [16]. The ASK-Q2 has a high internal consistency (Cronbach's Alpha = 0.88) [15]. The ASK-Q2 is a cross-cultural validated instrument which can be used in various cultures to assess and compare knowledge of autism across different countries.

The scoring of ASK-Q2 was done using the template from the producer. Higher scores on each domain indicate good knowledge and perception of autism. In this study, the total percentage score was calculated for each domain and then scores below 50% were said to be poor while scores 50% and above were said to be good.

2.5. Sample Size

The study used the Cochran formula for calculating sample size for a known prevalence rate.

$$n = \frac{Z^2 pq}{d^2}.$$

n = sample size required.

Z = 1.96 from a z -table at a 95% confidence interval.

p = prevalence of awareness from previous study = 15% [17].

q = $1 - p$.

d = margin of error (5%).

$$n = \frac{(1.96 \times 1.96)(0.15)(0.85)}{(0.05)^2}$$

$$n = \frac{0.48980}{0.0025}$$

$$n = 195.92.$$

Assuming a 10% non-response rate, the sample size increases, thus [18].

$$Na = \frac{n}{1 - 10\%}$$

$$Na = \frac{195.92}{0.9}$$

$$Na = 217.7, \text{ approximately } 218.$$

2.6. Sampling Technique

Multi stage sampling technique was used to recruit study participants. 40 participants were enrolled from 4 private schools and 70 from 3 public schools in Calabar municipal LGA. In Calabar south LGA, 44 participants were enrolled from 3 private schools while 67 participants were enrolled from 4 public schools. A total of 221 participants were enrolled but 3 declined consent. The various schools were selected using convenience sampling by which schools in an area were picked in no particular order. Simple random sampling by balloting was used to recruit teachers in these schools for the study.

2.7. Study Location

The study was conducted in the Calabar metropolis which is in Cross River State, southern Nigeria. It comprises 2 local government areas: Calabar South local government area & Calabar municipality [19].

According to the Cross River State Ministry of Education, there are about 318 registered private primary schools and 28 public primary schools spread across

the two Local Government Areas in Calabar.

This study included public and private primary schools located in Calabar Metropolis registered with the Cross River State Ministry of Education.

2.8. Pre-Test

A pre-test was conducted with 10% of the sample size (22 participants) at a separate primary school from the main study. The study was conducted by the research team with proper training. The time taken by the teachers to complete the questionnaires was about 10 minutes.

2.9. Ethical Approval

Ethical clearance was obtained from the research committee of the Federal Neuropsychiatric Hospital, Calabar. Teachers were informed that their participation was voluntary and that there would be no foreseeable risk.

2.10. Procedure

The service of one research assistant was enlisted, who was trained on how to administer the questionnaires. The research team visited the selected schools at a suitable break period to carry out the study.

The study was properly explained to the respondents at the various schools and an informed consent was taken from those that met the inclusion criteria. The questionnaires were distributed by balloting to reduce bias. These included the socio-demographic questionnaire and the Autism Stigma and Knowledge Questionnaire 2nd edition (ASK-Q2) which were self-administered.

Anonymous codes and markings were used on the questionnaires to ensure privacy. The procedure was repeated in the various schools until the required number for the study was obtained. After which, the responses were recorded and study participants who had poor knowledge and perception about autism were educated about the disorder.

2.11. Data Analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 25. The p-value was set at less than 0.05.

3. Results

The study was carried out among 218 primary school teachers within the two local government area in Calabar metropolis. The study assessed their knowledge and perception of autism and the following results were obtained.

3.1. Sociodemographic Variables of the Respondents

The mean age of the respondents was 42.67 ± 10 , with over half (53.2%) in the age bracket of 41 - 65 years. They were mostly females (83.5%) with a tertiary level of education (73.9%). A greater number of the respondents taught in government-

owned schools, with the majority having a teaching experience of 3 years and above (**Table 1**).

Table 1. socio-demographic variables.

Variable	Frequency	Percentage
Age		
18 - 40	102	46.8
41 - 65	116	53.2
Mean age	42.67 ± 10	
Gender		
Male	36	16.5
Female	182	83.5
Religion		
Christian	204	93.6
Non-Christian	14	6.4
Level of Education		
Primary	20	9.2
Secondary	37	17.0
Tertiary	161	73.8
Marital Status		
Single	41	18.8
Married	165	75.7
Divorced/Separated	12	5.5
School Type		
Private	81	37.2
Public	137	62.8
Teacher's Class		
Primary 1	39	17.9
Primary 2	41	18.8
Primary 3	59	27.1
Primary 4	44	20.2
Primary 5	35	16.0
Teaching experience		
1 year	9	4.1
2 years	21	9.6
3 years and above	188	86.3

3.2. The Autism Awareness Variables among Primary School Teachers

The majority of the respondents (79.4%) have heard about autism mostly through social media (47.2%). A greater percentage of the respondents (87.2%) believe that autism is a neurodevelopmental disorder and they should be referred to the hospital for treatment (**Table 2**).

Table 2. Autism awareness variables.

Variable	Frequency	Percentage
Heard about Autism?		
Yes	173	79.4
No	45	20.6
Means of awareness about autism		
Mass media	36	16.5
Social media	103	47.2
Friends and others	44	20.2
None	35	16.1
Prior training or contact with an autistic child		
Yes	59	27.1
No	159	72.9
Opinion about autism		
Spiritual problem	28	12.8
Neurodevelopmental	190	87.2
Referral pathway		
Church	21	9.6
Hospital	183	83.9
Traditional home	14	6.4

3.3. The Level of Autism Awareness/Knowledge and Perception among the Respondents

A good number of respondents showed good knowledge and perception of autism, with more than half of the participants, 60.1% and 57.3% respectively, having a good knowledge and perception of autism (**Table 3**).

Table 3. The level of awareness/knowledge and perception of autism.

Variable	Frequency	Percentage
Autism knowledge		
Good	131	60.1
Poor	87	39.9

Continued

Autism perception		
Good	125	57.3
Poor	93	42.7

3.4. The Relationship between Sociodemographic/Autism Awareness Variables and Knowledge of Autism

Table 4 showed that there were statistically significant relationships between knowledge of autism and respondents' opinions about autism, referral pathway, perception about autism and having heard about autism in the past.

Table 4. Relationship between sociodemographic/autism awareness variables and the knowledge of autism.

Variable	Good	Poor	Statistics	df	p-value
Age					
18 - 40	56 (54.9)	46 (45.1)	$X^2 = 2.15$	1	0.09
41 - 65	75 (64.7)	41 (35.3)			
Gender					
Male	20 (55.6)	16 (44.4)	$X^2 = 0.37$	1	0.33
Female	111 (61.0)	71 (39.0)			
Marital status					
Single	28 (68.3)	13 (31.7)	$X^2 = 1.41$	2	0.49
Married	96 (58.2)	69 (41.8)			
Divorce/separated	7 (58.3)	5 (41.7)			
Level of education					
Primary	10 (50.0)	10 (50.0)	$X^2 = 0.98$	2	0.61
Secondary	22 (59.5)	15 (40.5)			
Tertiary	99 (61.5)	62 (38.5)			
Heard about autism?					
Yes	111 (64.2)	62 (35.8)	$X^2 = 5.78$	1	0.01*
No	20 (44.4)	25 (55.6)			
Means of Autism awareness					
Mass media	19 (52.8)	17 (47.2)	$X^2 = 2.01$	2	0.36
Social media	68 (66.0)	35 (34.0)			
Friends and others	28 (63.6)	16 (36.4)			
Prior training or contact					
Yes	35 (60.3)	24 (39.7)	$X^2 = 0.00$	1	0.55
No	96 (60.4)	63 (39.6)			

Continued

Opinion about autism					
Spiritual problem	9 (32.1)	19 (67.9)	X ² = 10.4	1	0.00*
Neurodevelopmental disorder	122 (64.2)	68 (35.8)			
Referral pathway					
Church	10 (47.6)	11 (52.4)	X ² = 8.28	2	0.01*
Hospital	117 (63.9)	66 (36.1)			
Traditional home	4 (28.6)	10 (71.4)			
Autism perception					
Good	98 (78.4)	27 (21.6)	X ² = 40.9	1	0.00*
Poor	33 (35.5)	60 (64.5)			

3.5. Relationship between Sociodemographic/Autism Awareness Variable and the Perception of Autism

Table 5 showed that there were statistically significant relationships between autism perception with means of autism awareness, referral pathway, opinion about autism and having heard about autism in the past. Other variables, such as age, gender, and level of education, were not statistically significant.

Table 5. The relationship between sociodemographic/autism awareness variables and the perception of autism.

Variable	Good	Poor	Statistics	df	p-value
Age					
18 - 40	60 (58.8)	42 (41.2)	$X^2 = 0.17$	1	0.39
41 - 65	65 (56.0)	51 (44.0)			
Gender					
Male	21 (58.3)	15 (41.7)	$X^2 = 0.01$	1	0.52
Female	104 (57.1)	78 (42.9)			
Level of education					
Primary	11 (55.0)	9 (45.0)	$X^2 = 0.77$	2	0.68
Secondary	19 (51.4)	18 (48.6)			
Tertiary	95 (59.0)	66 (41.0)			
Heard about Autism?					
Yes	106 (61.3)	67 (38.7)	$X^2 = 5.29$	1	0.01*
No	19 (42.2)	26 (57.8)			
Means of autism awareness					
Mass media	15 (41.7)	21 (58.3)	$X^2 = 6.40$	2	0.04*
Social media	66 (64.1)	37 (35.9)			
Friends and others	29 (65.9)	15 (34.1)			

Continued

Prior training or contact						
Yes	34 (58.6)	24 (41.4)	$X^2 = 0.07$	1	0.45	
No	90 (56.6)	69 (43.4)				
Opinion about autism						
Spiritual problem	10 (35.7)	18 (64.3)	$X^2 = 6.14$	1	0.01*	
Neurodevelopmental disorder	115 (60.5)	75 (39.5)				
Referral pathway						
Church	8 (38.1)	13 (61.9)	$X^2 = 9.37$	2	0.00*	
Hospital	113 (61.7)	70 (38.3)				
Traditional home	4 (28.6)	10 (71.4)				

3.6. Relationship between Knowledge of Autism among Teachers in Private and Public Schools

Table 6 showed that teachers who taught in public schools had better knowledge of autism than those in private schools, and the relationship between them was not statistically significant ($p = 0.05$).

Table 6. The relationship between knowledge of autism among teachers in private and public schools.

Variable	Good	Poor	Statistics	df	p-value
School Type					
Private	42 (51.9)	39 (48.1)	$X^2 = 3.64$	1	0.05
Public	89 (65.0)	48 (35.0)			

3.7. Relationship between Teachers' Years of Experience and the Knowledge of Autism

Table 7 showed that respondents with 1 to 2 years of teaching experience had better knowledge of autism than those with 3 or more years of teaching experience. However, the relationship between teaching experience and knowledge of autism was not statistically significant ($p = 0.73$).

Table 7. The relationship between teachers' years of experience and the knowledge of autism.

Variable	Good	Poor	Statistics	df	p-value
Teaching experience					
1 year	6 (66.7)	3 (33.3)	$X^2 = 0.62$	2	0.73
2 years	14 (66.7)	7 (33.3)			
3 years and above	111 (59.0)	77 (41.0)			

3.8. Binary Logistic Regression Showing Adjusted Association of Knowledge of Autism

Table 8 showed that respondents between 41 - 65 years were twice as likely to be knowledgeable in autism as those between 18 - 40 years. The relationship between age and knowledge of autism was statistically significant ($p = 0.03$). Also, with the church as the reference group, an odd ratio of 0.08 for hospital referral indicates lower odds of good knowledge relative to church referral. The relationship between knowledge of autism and the referral pathway of the respondents was statistically significant ($p = 0.03$).

Table 8. Binary logistic regression showing adjusted association of autism knowledge/awareness among primary school teachers.

							95% CI	
Variable	B	S.E	Wald	df	p value	Odds ratio	lower	Upper
Age								
41 - 65	0.86	0 - 40	4.58	1	0.03*	2.37	1.07	5.21
18 - 40								
Gender								
Female	0.20	0.51	0.16	1	0.68	1.23	0.44	3.39
Male								
Education								
Tertiary	0.25	0.58	0.18	1	0.66	1.28	0.40	4.07
Secondary	0.59	0.59	0.97	1	0.32	1.80	0.55	5.83
Primary								
School type								
Public	0.24	0.39	0.39	1	0.52	1.27	0.59	2.74
Private								
Teaching experience								
3 years	−0.50	0.67	0.75	1	0.38	0.55	1.47	2.09
2 years	0.29	1.10	0.07	1	0.79	1.34	0.15	11.7
1 year								
Heard about autism								
No	−0.19	0.83	0.05	1	0.81	0.82	0.16	4.18
Yes								
Means of awareness								
Friends and others	0.14	0.46	0.10	1	0.75	1.15	0.46	2.88
Social media	0.48	0.57	0.72	1	0.39	1.63	0.53	5.01
Mass media								
Prior training								
No	0.25	0.40	0.50	1	0.47	1.33	0.60	2.91
Yes								

Continued

Opinion about autism								
Neurodevelopmental	1.20	0.94	1.62	1	0.20	3.33	0.52	21.3
Spiritual								
Referral pathway								
Traditional home	-1.25	0.98	1.63	1	0.20	0.28	0.04	1.95
Hospital	-2.45	1.13	4.67	1	0.03*	0.08	0.00	0.79
Church								

3.9. Binary Logistic Regression Showing Adjusted Association of Perception of Autism

Table 9 showed no statistical relationship between age, gender, referral pattern, opinion about autism, etc and perception of autism.

Table 9. Binary logistic regression showing adjusted association of perception of autism by primary school teachers.

								95% CI	
Variable	B	S.E	Wald	df	p value	Odds ratio	Lower	Upper	
Age									
41 - 65	−0.08	0.39	0.04	1	0.83	0.92	0.42	1.97	
18 - 40									
Gender									
Female	0.12	0.50	0.06	1	0.80	1.13	0.42	3.07	
Male									
Heard about Autism									
No	−0.29	0.82	0.12	1	0.72	0.74	0.14	3.74	
Yes									
Means of awareness									
Friends and others	0.25	0.46	0.31	1	0.57	1.29	0.52	3.18	
Social media	0.93	0.55	2.88	1	0.08	2.54	0.86	7.48	
Mass media									
Prior training									
No	−0.20	0.39	0.27	1	0.59	0.81	0.37	1.75	
Yes									
Opinion about autism									
Neurodevelopmental	−0.59	0.92	0.40	1	0.52	0.55	0.09	3.38	
Spiritual problem									
Referral pattern									
Traditional home	−0.93	0.90	1.06	1	0.30	0.39	0.06	2.30	
Hospital	0.49	1.04	0.22	1	0.63	1.64	0.21	12.6	
Church									

4. Discussion

The study was a cross-sectional study conducted among 218 primary school teachers in Calabar metropolis. The study showed that 60.1% of the respondents had good knowledge, and 57.3% had a good perception of autism. The predictors of the level of knowledge about autism among the respondents are age and referral pathways of the teachers. The results of the study will be discussed according to the study objectives.

4.1. The Level of Knowledge of Autism among the Respondents

The level of knowledge of autism among the respondents was 60.1%, which is relatively high. This is in keeping with a study done by Odunsi *et al.* on Nigeria's teachers' understanding of autism spectrum disorder, which showed that a greater percentage of teachers demonstrated an accurate knowledge of ASD [17]. Another study in China by Lu *et al.* showed that 53.9% of the teachers had an average score for knowledge of autism spectrum disorder [20]. Better teachers' ASD knowledge correlates with a more positive attitude towards students with ASD [20]. Another study by Young *et al.* in the US showed that most participants (95.3%) had adequate knowledge of ASD and limited stigma towards ASD [21]. This might be because of the training of the teachers on autism spectrum disorder in the study.

However, a study in Tanzania by Edward *et al.* showed that the majority of the teachers were less knowledgeable about ASD and its associated features. About 62.5% of the teachers did not understand the meaning of autism [22]. This might be because no structured interview instrument was used in assessing the teacher's knowledge about autism. Another study in China by Liu *et al.* revealed that most of the teachers (83%) were unable to provide accurate responses to half of the questionnaire items relating to ASD [23].

The predictors of knowledge of autism among the teachers include age and referral pathway. The study showed that older teachers had better knowledge of autism than the younger ones. This is in keeping with studies by Omolayo *et al.* and Al-Sharbati *et al.*, which showed age had a significant influence on the knowledge of autism spectrum disorder [8] [24].

Some studies on knowledge of autism have explored different referral pathway suggestions by teachers, but none, to the best of my search showed a statistically significant relationship between referral pathway by teachers and knowledge of autism. The study showed that the teachers' referral pathway is a predictor of the level of knowledge of autism.

4.2. The Level of Perception of Autism among Teachers

The study showed that the level of perception of autism among the respondents was 57.3%. This is similar to a study done by Paul *et al.* on the awareness of autism among primary school teachers in Bayelsa State, where 50% of the respondents had a good perception about autism [11]. Another study by Arif *et al.* on the awareness of autism in Oman showed a lower rate of 37.8% [25]. This might be due to the variability in the assessment tools used to measure the level of percep-

tion of autism among the respondents.

4.3. The Relationship between Teachers' Knowledge of Autism in Private and Public Schools

The study showed that there was no statistically significant relationship between teachers' knowledge of autism in private and public schools. This is similar to a study done by Omolayo *et al.* and Arif *et al.* which did not show any statistically significant relationship between knowledge of autism among teachers of private and public schools [8] [25]. However, Al-Sharbati *et al.*, which showed that more teachers teaching in the public schools had a better knowledge of autism, and there was a statistical relationship in knowledge between teachers in public and private schools [24].

4.4. The Relationship between Teachers' Years of Experience and the Knowledge of Autism

The study showed no statistically significant relationship teacher's years of experience and their knowledge of autism. This is similar to a study done by Al-Sharbati *et al.* in Oman and Omolayo *et al.* in Nigeria, which showed that the teaching experience and years of work as a teacher did not influence the knowledge of autism [8] [24]. Also, another study by Bagci *et al.* in Türkiye showed no statistically significant relationship between teachers' years in the profession and the knowledge of autism [5]. This goes to buttress the need for teachers' training in autism awareness, as the years of teaching experience may not amount to being knowledgeable in autism.

4.5. Study Limitations

- 1) The study design was cross-sectional, which limits the inference of causality between the associations found.
- 2) The study was conducted in an urban setting, which might have resulted in more awareness of autism among the teachers, unlike in rural areas, where the knowledge might be deficient.

5. Conclusion

The study showed that the level of knowledge and perception of autism among primary school teachers in Calabar, Nigeria, was generally good. The predictors of knowledge of autism were age and referral pathway of the teachers. This underscores the need for more campaigns and sensitisation about autism among teachers, as this would influence how they care for autistic children and also enable them to make good referral choices.

6. Recommendations

- 1) There is a need for more campaigns and sensitisation of primary school teachers through various media on the basic features of autism and the need to

make appropriate referrals.

2) The government need to fund research on autism and make the treatment of autistic children free in all the government owned facility. This will improve care and awareness of autism among the populace.

3) Activities to mark the world autism day should be made compulsory in primary schools, as this will help enlighten both the teachers and the parents on the knowledge and perception of autism.

Ethics Approval and Consent to Participate

Ethical clearance was obtained from the research committee of the Federal Neuropsychiatric Hospital, Calabar, with reference number FNPH/HREC/2026/139. The research was conducted in accordance with the Helsinki declaration. Teachers were informed that their participation was voluntary and that there would be no foreseeable risk. Informed written consent was obtained from adult teacher participants of the various schools.

Availability of Data and Materials

The data set used and/or analysed during the current study is available from the corresponding Author on reasonable request.

Author Contributions

IE: Conceptualised the research, supervised data collection, and was involved in the analysis of the results.

IA: Review of research work and analysis.

CT: Review and analysis.

IU: Revision, analysis and logistics.

NN: Data collection.

All authors read and approved the final manuscript.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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List of Abbreviations

ASD	Autism Spectrum Disorder
ASKO2	Autism Stigma and Knowledge Questionnaire 2 nd edition
SDQ	Socio-demographic Questionnaire
SPSS	Statistical Package for Social Sciences