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Nigerian Teachers' Understanding of Autism Spectrum Disorder: A Comparative Study of Teachers from Urban and Rural areas of Lagos State

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ABSTRACT

Purpose: *Autism Spectrum Disorder (ASD) is a lifelong developmental disability characterised by difficulties in social interaction and social communication, and restricted and repetitive behaviour (American Psychiatric Association, 2013). Despite its prevalence the world over, there is a paucity of research in some areas such as education, particularly in sub-Saharan Africa. This paper attempts to address the gap by exploring teachers' understanding of ASD in Nigeria.*

Method: *Using an adapted version of the Knowledge About Childhood Autism Among Health Workers (KCAHW) questionnaire (Bakare et al, 2008), a survey was conducted among 177 mainstream primary teachers from Lagos State (112 from eleven urban schools and 65 from four rural schools).*

Results: *The total mean score on the Adapted KCAHW questionnaire among all the participating teachers was 10.81 ± 4.13 out of a possible total of 16. The mean score for urban teachers was 11.21 ± 4.31, while the mean score for rural teachers was 10.11 ± 3.75. In total, 46% of the urban teachers and 31% of the rural teachers demonstrated a generally accurate knowledge of ASD, with 15% (23 urban teachers and 4 rural teachers) of the sample answering all questions correctly. Over 50% of urban teachers and almost 70% of rural teachers surveyed had only a low or moderate understanding of ASD.*

Conclusions: *This research supports previous studies that identified low professional knowledge and understanding of ASD, and a need for improved professional education and training.*

Limitations: *The focus was on only one state within Nigeria, and only on mainstream primary schools. Further research is necessary across the educational age range as well as different geographical areas in the country.*

Keywords: *Education, knowledge.*

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INTRODUCTION

Autism Spectrum Disorder (ASD) is a lifelong developmental condition, characterised by differences and difficulties in social interaction, social communication, restricted and repetitive behaviours, including differences regarding the perception and management of sensory stimuli (American Psychiatric Association, 2013).This condition has a worldwide median prevalence of 62 per 10,000 (Elsabbagh et al, 2012), although identified prevalence varies widely from region to region. In areas where diagnostic services and research into ASD are well established, such as the UK, this figure can rise to about 1 per 100 (Baird et al, 2006). However, in other areas where less research has been undertaken, information regarding ASD can be partial and fragmented. Significant challenges are faced regarding assessment, identification and appropriate treatment across Sub-Saharan Africa in general (Bakare and Munir, 2011a; Ruparelia et al, 2016) and within Nigeria in particular.

ASD and Sub-Saharan Africa

Sub-Saharan Africa comprises the 46 countries south of the Sahara Desert. These are overwhelmingly low-income countries, with a combined population of more than 970 million people, half of whom are below the age of 18 years (UNICEF: Division of Data, Research and Policy, 2014). Due to the prevalence in this region of communicable diseases such as malaria and Human Immunodeficiency Virus (HIV), developmental disorders such as ASD have historically been under-researched. However, medical improvements over recent decades have led to a decline in child mortality (Rajaratnam et al, 2010). As more infants survive into childhood and beyond, there is a corresponding need to meet the needs of children with developmental issues such as ASD (Scherzer et al, 2012). However, there are considerable knowledge gaps in research and practice regarding ASD throughout the region (Franz et al, 2017).

ASD in Nigeria

Nigeria is a federal republic in West Africa comprising 36 states plus the federal capital, with almost 750 local governments (World Education News and Reviews, 2017). With a population of approximately 192 million, it is the most populous country in Sub-Saharan Africa (Worldometers, 2017). ASD was first identified in Nigeria in the 1970s (Franz et al, 2017). Despite this, prevalence rates for the condition remain uncertain (Bakare et al, 2012). A study by Bakare and

Munir (2011b) suggested a prevalence rate of 0.08%, acknowledging that this may be artificially low due to the very limited attendance of children at clinics for childhood developmental disorders. More recently, Lagunju et al (2014) reported a prevalence rate of 2.3%, with five times as many males as females identified, while Chinawa et al (2016) suggested a prevalence rate of 2.9% among schoolchildren in South East Nigeria. Children and young people identified with ASD have been predominantly non-verbal, and co-morbidity with intellectual disability is common as is late identification, often well after age 8 (Bakare and Munir, 2011b; Lagunju et al, 2014).

Education and Inclusion in Nigeria

Education within Nigeria is administered by federal, state and local governments. Overall policy formation is the responsibility of the Federal Ministry of Education, which is also involved in the provision of tertiary education. Primary education is largely managed at a local governmental level, while secondary education is mainly provided at a state level (World Education and News Reviews, 2017). The concept of Universal Basic Education (UBE) was introduced to Nigeria in 1988, and strengthened by the UBE Act of 2004 and its accompanying policy guidance (Nigerian Educational Research and Development Council, 2004); this enabled many children – including those with Special Educational Needs (SEN) – to attend primary schools (Imam, 2012). The Nigerian government has adopted the Salamanca Statement regarding the rights of children with SEN to access inclusive education (UNESCO, 1994); nonetheless, significant challenges remain regarding the translation of this principle into practice (Ajuwon, 2008).

Teachers' Knowledge regarding ASD

Research into ASD in Nigeria in particular, and Sub-Saharan Africa in general, has been identified as being limited (Franz et al, 2017), and has largely been undertaken within a medical or healthcare context. Studies have been conducted on how ASD is understood by Nigerian healthcare professionals such as doctors (Eseigbe et al, 2015), nurses (Igwe et al, 2011), healthcare workers (Bakare et al, 2008; Bakare et al, 2009a, 2009b) and medical students (Igwe et al, 2010). All the studies have identified knowledge about ASD to be low and have highlighted a need for education and training.

The typical characteristics of ASD – communication and social difficulties, restricted and repetitive behaviours, and sensory issues – can challenge typical

teaching strategies and approaches (Jones et al, 2008). It has further been shown that individuals with ASD process information and learn differently to typically-developing children (Gunn and Delafield-Butt, 2016). Effectively addressing the needs of those with ASD has implications for all aspects of educational provision: the school and classroom environment, the curriculum, teaching materials and teaching strategies (Barson, 2010). Where teachers lack an accurate understanding of ASD, or hold misconceptions about the condition, it may lead to a mismatch between the educational provision being offered and the child's abilities, skills and needs, which can have a negative impact on outcomes (Helps et al, 1999). Conversely, it has been shown that where teachers have a firm understanding of ASD, there are benefits for both children and teachers (Syriopulou-Delli et al, 2012; Engstrand and Roll-Pettersson, 2014).

Research in this region concerning educational issues and ASD is limited and fragmented (e.g., Obiyo et al, 2013; Bello-Mojeed et al, 2016). Only two previous studies regarding ASD in Sub-Saharan Africa have been identified which have even tangentially considered teacher's professional knowledge. Denkyirah and Agbeke (2010) surveyed preschool teachers from Ghana alongside their counterparts from the USA concerning transition strategies for pupils with ASD; this study did not, however, investigate teachers' knowledge about the condition. Audu and Egbochuko (2011) surveyed 131 primary teachers from Benin City in Edo State, Nigeria, regarding their knowledge about ASD, and found that only 23% of them believed that ASD existed within Edo State, suggesting a low level of awareness.

AIM

This study seeks to fill the gap in research on ASD and education in Nigeria by surveying teachers to understand their levels of knowledge about ASD, and by attempting to identify the factors that may be responsible for more or less knowledge across two groups of teachers (urban and rural) within Lagos State.

METHOD

Setting

This study was carried out within Lagos State, at 11 mainstream primary schools in urban areas and 4 rural primary schools. The average class size in both urban and rural schools was 30 pupils per class, and the children were between 6-11 years of age.

Sample Group

During October 2013, 232 questionnaires were distributed to teachers working in the urban schools. One hundred and twelve were returned (an urban response rate of 48%). During April 2014, 70 questionnaires were distributed to the four rural schools. Sixty-five questionnaires were returned (a rural response rate of 93%). In total, 302 questionnaires were distributed and 177 were returned, with an overall response rate of 59%.

The majority of teachers were female; only 16 urban teachers (14%) and 10 rural teachers (15%) were male. Among the urban teachers 87% held a teaching qualification, whereas in the rural schools only 65% were qualified teachers. Teachers in the rural schools had slightly more experience, with 57% having taught for 16 years or more, and none having less than 5 years' experience. By contrast, 16% of the urban teachers had taught for less than 5 years, and only 47% had taught for 16 years or more. Rural teachers were also generally older, with only 17% being under 40 years of age, and 35% being 51 years or older. Again, by contrast, 43% of the urban teachers were under 40 years of age, and only 27% were 51 years or older (see Table 1).

Table 1: Socio-demographic Information about Sample

	Urban teachers (n=112)	Rural teachers (n=65)
Sex: male	16 (14%)	10 (15%)
Sex: female	96 (86%)	55 (85%)
Age: 21-30	7 (6%)	1 (2%)
Age: 31-40	41(37%)	10 (15%)
Age: 41-50	34 (30%)	31 (48%)
Age: 51 years and above	30 (27%)	23 (25%)
Teaching status: qualified	15 (13%)	42 (65%)
Teaching status: unqualified	97 (87%)	23 (35%)
Teaching experience: <5 years	18 (16%)	0 (0%)
Teaching experience: 6-15 years	41 (37%)	28 (43%)
Teaching experience: 16-25 years	33 (29%)	22 (34%)
Teaching experience: 26 years and above	20 (18%)	15 (23%)

Survey Instrument

The survey tool used was adapted from the Knowledge About Childhood Autism Among Health Workers (KCAHW) questionnaire developed by Bakare

et al (2008). This tool was designed specifically to identify knowledge about ASD within a Nigerian context. It has been validated and used in multiple studies relating to Nigerian healthcare professionals' knowledge regarding ASD (Bakare et al, 2008, 2009b; Igwe et al, 2010, 2011). The tool collects data in four domains.

- **Domain 1:** Impairments in social interaction. This domain contains 8 questions addressing problems in social interaction usually found in children with ASD. A maximum score of 8 and minimum score of 0 are possible in this domain.

- **Domain 2:** Impairments in communication. This domain contains 1 item addressing problems regarding communication and language development, as part of the symptoms seen in children with ASD. A maximum score of 1 and minimum score of 0 are possible in this domain.

- **Domain 3:** Obsessive and repetitive behaviours. This domain contains 4 items addressing the restricted and repetitive behaviours found in children with ASD. A maximum score of 4 and minimum score of 0 are possible in this domain.

- **Domain 4:** Other information about ASD. This domain contains 3 items that address knowledge on the nature of ASD, possible co-morbidity with intellectual disability, and educability. A maximum score of 3 and minimum score of 0 are possible in this domain.

The tool was slightly adapted for use with teachers rather than healthcare professionals. Questions within Domains 1 (8 questions), 2 (1 question) and 3 (4 questions) remain unchanged. However, questions in Domain 4 were reduced from 6 to 3 questions, and were amended in order to gain an understanding of educational perspectives on ASD. Questions which had a specific medical focus were removed, while a question regarding the presentation of ASD within a spectrum from severe to mild was added, along with a question – informed by Nigeria's commitment to educational inclusion – regarding the participation of children with ASD in mainstream educational settings. The tool was field-tested before use, to ensure that the language and terminology used remained appropriate for the Nigerian context.

Ethical Issues

Ethical approval for the study was provided by the University of Northampton Research Ethics Committee, which scrutinised all research processes and tools.

All potential participants were provided with information regarding the study, and assured that data would be anonymised. Consent was interpreted by the return of the completed questionnaire. Data was stored securely in compliance with the requirements of the British Educational Research Association (2011) and the institution.

RESULTS

Teachers' responses to the 16 statements in the Adapted KCAHW are shown in Table 2 below. Results with regard to the overall questionnaire are presented first and then followed by domain results.

Table 2: Responses to Adapted KCAHW

Statement	Urban teachers (n=112)		Rural teachers (n=65)	
	No	**%**	**No**	**%**
Domain 1				
Marked impairment in use of multiple non-verbal behaviours such as eye-to-eye contact, facial expression, body postures and gestures during social interaction	95	85	54	83
Failure to develop peer relationship appropriate for developmental age	87	78	39	60
Lack of spontaneous will to share enjoyment, interest or activities with other people	83	74	38	58
Lack of social or emotional reciprocity	79	71	42	65
Staring into open space and not focussing on anything specific	79	71	44	68
The child can appear as if deaf or dumb	83	74	39	60
Loss of interest in the environment and surroundings	80	71	29	45
Social smile is usually absent in a child with autism	73	65	26	40
Domain 2				
Delay or total lack of development of spoken language	85	76	49	75
Domain 3				
Stereotyped and repetitive movement (e.g. hand or finger flapping or twisting)	88	79	41	63
May be associated with abnormal eating habit	85	76	43	66
Persistent preoccupation with parts of objects	74	66	40	62

Love for regimented routine activities	61	54	40	62
Domain 4				
Autism is on a continuum from very severe (with no speech) to mild with speech	69	62	44	68
Children with autism can be educated in mainstream schools	70	62.5	42	65
Autism could be associated with intellectual disability	80	71	49	75

Distribution of Scores regarding the Adapted KCAHW

The maximum possible score on the Adapted KCAHW questionnaire is 16 and the minimum score is 0. The questionnaire is divided into 4 domains with maximum possible scores of 8, 1, 4 and 3 respectively; a minimum score of 0 is possible in each domain.

Bakare et al (2008) identify that the mean total score on the KCAHW questionnaire can provide a measure regarding the level of knowledge about ASD among that particular population, while Igwe et al (2011) state that a maximum score on the KCAHW indicates adequate knowledge of the signs and symptoms of ASD. The authors of the current study suggest that a score of 0-6 indicates a low knowledge of ASD on the part of the respondent, a score of 7-12 indicates a moderate knowledge of ASD, while a score of 13 and above indicates a generally accurate knowledge of ASD.

There was wide divergence regarding the teachers' responses, and there were no questions where consensus was achieved. Only 23 teachers from urban Lagos State (21%) and 4 teachers from rural Lagos State (6%) answered all questions correctly. The mean score for the urban teachers was 11.21 ± 4.31, while the rural teachers had a mean score of 10.11 ± 3.75. Mean total scores in each of the domains is shown in Table 3 below.

Table 3: Distribution of Scores on Adapted KCAHW among Teachers

Domain	Maximum possible score	Urban teachers (n=112)	Rural teachers (n=65)
Domain 1	8	5.71, SD = ± 1.93	4.74, SD = ± 2.18
Domain 2	1	0.76, SD = ± 0.43	0.75, SD = ± 0.43
Domain 3	4	2.75, SD = ± 1.23	2.46, SD = ± 1.2
Domain 4	3	1.99, SD = ± 1.01	2.06, SD = ± 1.0
Mean score	16	11.21, SD = ± 4.31	10.11, SD = ± 3.75

Domain 1: Impairments in Social Interaction

Questions in Domain 1 concerned the social difficulties in ASD, including problems regarding peer relationships, play, and social reciprocity. Urban teachers scored more highly on average than their rural counterparts, with a mean score of 5.71 ± 1.93, compared to 4.74 ± 2.18.Over 80% of teachers in both groups identified that ASD was characterised by 'marked impairment in use of multiple non-verbal behaviours such as eye-to-eye contact, facial expression, body postures and gestures during social interaction'. However, there was greater diversity with regard to the statements concerning how this marked impairment might present, with a higher percentage of urban teachers than their rural counterparts identifying ways in which this may occur.

Statistically significant differences were found between the two groups of teachers with regard to 2 questions. These related to interest in the environment and surroundings (chi-square = 7.6614, df=2, significance level = .005641) and absence of social smile (chi-square = 6.6974, df=2, significance level = .009655). In both cases, about two-thirds of urban teachers were aware that these behaviours could be indicative of ASD, compared with less than half of the rural teachers.

Domain 2: Impairments in Communication

This question concerned communicative difficulties in ASD. As in the original KCAHW, this was limited to verbal communication, with non-verbal communication being addressed as part of Domain 1. Urban and rural teachers' responses were very similar here, with about three-quarters of the participants in each group correctly identifying this communicative impairment.

Domain 3: Obsessive and Repetitive Behaviours

This domain investigated knowledge regarding stereotypical movements such as hand flapping, eating problems, the desire for routines and interest in objects. Urban teachers scored more highly here with a mean score of 2.75± 1.23, as compared with the rural teachers' score of 2.46 ± 1.2. Many teachers were unaware of the preference among children with ASD for routines (n=51, 46% of urban teachers and n=25, 38% of rural teachers). There were no statistically significant differences between the two groups.

Domain 4: Other information about ASD

About two-thirds of teachers in both groups were aware that ASD is a spectrum condition with a range of presentation from mild to severe; and about three-quarters were aware that it can occur alongside intellectual disability. About two-thirds of the teachers also identified that children with ASD can be educated in mainstream schools. Rural teachers scored slightly higher overall (2.06 ± 1.0) than their urban counterparts (1.99 ± 1.01) in this domain. There were no statistically significant differences between the two groups.

Overall Adapted KCAHW Score

The total mean score on the Adapted KCAHW questionnaire among all teachers participating in the study was 10.81 ± 4.13 out of a possible total of 16. Overall, the mean score for the urban teachers was 11.21 ± 4.31, while the mean score for rural teachers was 10.11 ± 3.75. This indicates that urban teachers therefore had an overall higher level of knowledge than their rural counterparts. It was a matter of concern that over 50% of urban teachers and almost 70% of rural teachers surveyed had only a low or moderate understanding of ASD (see Table 4). In total, 46% of the urban teachers and 31% of the rural teachers demonstrated a generally accurate knowledge of ASD, with 15% of the whole sample (23 urban and 4 rural teachers) answering all questions correctly. The differences in accuracy levels between urban and rural teachers do not reach statistically significant levels (chi-square = 3.7336, df = 2, significance level = .154616), and it is acknowledged that there are demographic variables between the two groups (such as the age profile of the teachers) as well as a difference in response rate. Nonetheless the results reflect findings in other settings that suggest that professionals working in urban environments may have greater exposure to pupils with ASD – or to information about the condition in general – and therefore demonstrate a more accurate understanding and provide more appropriate support (Lai et al, 2012; Zhang et al, 2017).

Table 4: Teachers' level of Knowledge by Location

Location	Low accuracy (0-6)		Moderate accuracy (7-12)		Generally accurate (13-16)	
	N	%	N	%	N	%
Urban teachers (N=112)	15	13	46	41	51	46
Rural teachers (N=65)	11	17	34	52	20	31
All teachers (N=177)	26	15	80	45	71	40

The potential impact of other variables such as qualification, gender, experience and age were also considered (Table 5). None of these variables achieved statistical significance at <.01, though it should be noted that 56% of teachers under 40 years of age had a generally accurate understanding of ASD, in comparison with just 28% of those over 51 years (Table 6). This result supports other studies suggesting that older professionals may sometimes lack up-to-date knowledge and awareness about ASD (Johnson et al, 2013).

Table 5: Consideration of other variables on Teachers' Knowledge of ASD

Variable	Chi-square	df	Level of significance
Qualification	4.8891	2	.086764
Gender	5.1589	2	.075816
Length of experience	5.2569	6	.511314
Teachers' age	10.6115	4	.031295

Table 6: Teachers' level of Knowledge by Age

Age	Low accuracy (0-6)		Moderate accuracy (7-12)		Generally accurate (13-16)	
	N	%	N	%	N	%
Under 40 (n=59)	5	8	21	36	33	56
41-50 (n=65)	10	15	32	49	23	35
51+ (n=53)	11	21	27	51	15	28

DISCUSSION

The findings of this study suggest that – as with professionals within the country's health services and educators in Edo State – school teachers in Lagos State, Nigeria, are generally relatively ignorant about ASD. Over 50% of urban teachers and almost 70% of rural teachers have only a low or moderate understanding of the condition. Furthermore, there is a high degree of divergence both within and across the two groups of teachers with regard to all questions in the Adapted KCAHW. This indicates that behaviours felt to be characteristic of ASD by some teachers were not considered as such by others. It suggests that ASD is conceptualised diversely within this sample.

How professionals conceptualise ASD has been shown to be influenced by many factors. These include previous experience of working with children with ASD, family experience, religious or cultural beliefs, the impact of the media or the wider community, and so on (Mavropoulou and Padeliadu, 2000; Bakare et al, 2009b; Imran et al, 2011; Alqahtani, 2012). ASD is often conceptualised negatively throughout Sub-Saharan Africa, with those affected by the condition frequently being considered as 'witches' or 'possessed' (Cimpric, 2010). Such views may be held not only by the general population but also by professionals, and can lead to stigmatisation and discrimination (Okey-Martins Nkwolo, 2015). Bakare et al (2009b) reported that 27% of Nigerian nurses included in their study believed ASD to have a supernatural cause, such as cursed ancestral spirits or the action of the devil. Whatever the contributory factors, it is inevitable that inconsistent conceptualisation of ASD, such as that evidenced within this sample of teachers, will lead to inconsistency in how they understand and respond to the educational needs of the children they teach.

Research across a range of disciplines including health (Heidgerken et al, 2005), social work (Preece and Jordan, 2007) and education (Jones et al, 2008) has identified the importance of professionals having a sound understanding of ASD, and the positive impact this can have on the lives of children with ASD and their families (Tilahun et al, 2016). Moreover, accurate knowledge about ASD and the use of ASD-appropriate strategies have been shown to improve teacher self-efficacy and confidence and to reduce likelihood of stress and burnout (Jennett et al, 2003; Ruble et al, 2011). The current study therefore concurs with previous research (Leblanc et al, 2009; Guldberg et al, 2011; Franz et al, 2017) that training with regard both to ASD awareness and appropriate intervention strategies – and evaluation of the impact of such training on professionals' knowledge, skills and attitudes – is required if children with ASD are to have their needs successfully addressed.

CONCLUSION

ASD is a developing area of research within Sub-Saharan Africa in general and Nigeria in particular, and as such it is relatively unsurprising that this study has identified the level of knowledge among educational professionals within Nigeria to be generally low. This study supports previous research in arguing that there is a need for improved professional education and training regarding the condition.

Limitations

It is acknowledged that this study has focussed only on one state within the country, and only on educators within mainstream primary schools. Further research is necessary, not only across the educational age range but across the different geographical areas of the country.

Implications

There is the need for further research – both within Nigeria and across Sub-Saharan Africa as a whole – which focusses not only on teachers' knowledge but also on how they are currently teaching children with ASD, what is currently effective and how educational interventions in ASD that are developed within high-income countries can be adapted and utilised within a Nigerian context. Such research – and the practical developments arising from these studies, such as the development of locally-appropriate training and practice – can have a transformative impact on the lives of children with ASD, their families and their teachers within this region.

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