

## Identifying autism spectrum disorders in school children for placement using a valid screening instrument in Nigeria

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### Abstract

The purpose of this study is to identify and analyze the Autism Spectrum Disorders (ASD) using Childhood Autistic Rating Scale (CARS). This research was also conducted as an effort to carry out placement and intervention in special schools. Samples of this study is 52 subjects randomly selected from the population of 138 were used to rate their behaviours using the CARS. Method that used in this study is cross-categorical survey (descriptive research). This is a survey that studies a group of sample in order to identify traits of such group. With the use of statistical data of chi-square, scores collected from the participants revealed that there was no significant difference in the scores or ratings. Also, the result obtained from the use of t-test indicated that the instrument significantly differentiate ASDs traits from Non-ASDs. The findings in this study prompted a suggestion that special schools, centres, homes etc should get this valid instrument handy for the purpose of identifying autistic traits in school children for correct placement and intervention.

**Keywords:** Autism spectrum disorders, placement, valid instrument, CARS, non-autism spectrum disorders

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## Introduction

One of the main problem in autism study has been the lack or ineffective valid measurement of screening and identifying children and adults with Autism Spectrum Disorders (ASDs) from other children with intellectual disabilities (Charman & Gotham, 2013; Must, Phillips, Curtin, & Bandini, 2015). Over the years, Rimland and Edelson explained that researchers within the area of Autism Spectrum Disorder (ASD) have developed and revealed many studies making an attempt to diagnose varied characteristic traits of distinguishing children with ASD. Developing nations have inherited this gap of developing, adopting or adapting screening instruments to be utilized in identifying children with ASDs from age-appropriate non-autism peers for the needs of treatments and placements. Specialists and parents of children with ASD have shown concerns concerning the children's behaviour and development on early identification and screening for correct placement and treatment instead of placement with age-appropriate peers (Becerra et al., 2017; Brugha, Doos, Tempier, Einfeld, & Howlin, 2015; Chan & Lam, 2018). He declared that once the parents of children with ASD had two or additional problems concerning their child's development (e.g. self-help, social or receptive language difficulties) use of supplementary and correct screening was necessary to aid diagnosing, placement and interventions. The worries of parents and professionals was also expressed on early diagnosing of the presence of ASDs, that diagnosing of ASDs, might not be until school-going age or maybe later (Coleman & Gillberg, 2012) and is unfortunately even the case that Asperger's Syndrome (AS) could go unnoticed till adulthood (Kanfiszer, Davies, & Collins, 2017; Stoddart, Burke, & King, 2012). Wherever the gaps and problems exist, and if ASDs lie on a spectrum, we want a valid quantitative instead of a categorical approach to screening and diagnosis (Wall, Kosmicki, Deluca, Harstad, & Fusaro, 2012) (Allison, Auyeung, & Baron-Cohen, 2012; Wall, et al., 2012). Nigerian scenario can share from this

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expertise as there are lack of reliable, sensitive, poor system, illiteracy, lack of legislation and non existence of screening instruments to early identification of children with ASDs at preschool ages, possible screening or identification is left till school-going age of four years and later.

Screening and Identification are completely different, however connected activities involving the detection of impairments with a view to ameliorate, interfere or improve of resultant effect of the problem. Screening is that of prospective identification of unrecognized disorder by the application of specific tests or examinations. Identification is observant, knowing, judgement of exact deficits or behaviour of individual. Most of the screening tests that are designed to identify neuro developmental disorders do not meet the tight criteria (Barton, Dumont-Mathieu, & Fein, 2012; Muratori et al., 2011). This is happened because of some conditions, such as language barrier, uncertainty regarding and tests tend to possess low sensitivity and specificity (Finnegan & Accardo, 2018). Within the latter case, even once the sensitivity and specificity of a screening remain constant, the positive projecting value is lesser than the disorder within the population (Clark & Harrington, 1999; Kang et al., 2018; Kong et al., 2012; Liu, Li, & Yi, 2016).

The idea of biological process of identification could be a parent-professional partnership that takes a broader look at the developmental and activity skills and progress over time (Adebisi, Elemukan, & Gomos, 2018). It combines the observations of experts of ASDs with the biological process information, with the skilled in the preparation of specific tests. The proof that the use of screening instruments, together with asking parents of children with ASDs, regarding their behaviours, improve the potency and validity of such instrument (Glascoe & Marks, 2011). However, the quantity and sort of concerns that parents have regarding their child's behaviour and development verify the concern and the use of that screening instrument in the clinic setting is effective. However, Glascoe in some series of studies using the Parents' Evaluations of Developmental Status (PEDS) has shown that once parents of children with ASDs had one major concern regarding their child's development (or there was a communication barrier between parents and specialists) the employment of a screening determine the specificity of such concern (Glascoe, 1997). However, when parents of children with ASDs had two or additional worry regarding their child's development (e.g. self-help, social or receptive language difficulties) use of additional screens was necessary to determine diagnosis, placement and intervention (Mayes, Calhoun, Murray, Ahuja, & Smith, 2011).

Autism Spectrum Disorders are specific developmental disorders within which there are qualitative impairments in social interaction and communication combined with a restricted repertoire of interests, activities and behaviours, with onset in childhood traits. Included within the types of ASDs are Autism, Rett's syndrome, Childhood Disintegrative Disorder, Asperger's Syndrome and Pervasive Developmental Disorder – Not Otherwise Specified/PDD-NOS (Association, 2013; Organization, 2013). In general, Individuals who are diagnosed with ASDs have many similar learning and behavioural traits. First, there are marked delays in multiple areas of development: social interaction skills, communication skills, and stereotypic behaviour, interests, and activities (Association, 2013). There are quantitative and qualitative variations within the learning and behavioural traits exhibited by individuals who have the disorders

The concept of ASDs has changed significantly in the last few years (Curran et al., 2015; Pelphrey, Shultz, Hudac, & Vander Wyk, 2011), it is developed from year to year. The last edition of the most important international classification of mental disorders, the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5), approves these improvement and included autism within the neuro developmental disorders (Spooren, Lindemann, Ghosh, & Santarelli, 2012), debunking the former concept of a Pervasive Developmental Disorder (PDD) in DSM-4 that include (Huerta, Bishop, Duncan, Hus, & Lord, 2012; Matson, Kozlowski, Hattier, Horovitz, & Sipes, 2012): 1) Autistic disorder; 2) Rett syndrome; 3) Asperger syndrome; 4) Childhood Disintegrative Disorder; 5) Pervasive Developmental Disorder-Not Otherwise Specified

Likewise, children who have cleared deficits in social communication, but whose signs do not meet criteria for autism spectrum disorder, should be evaluated for "social communication disorder". The main difference with ASD is that social communication disorder does not contain diagnostic criteria B, therefore there is no observation of restrictive or repetitive patterns of behaviour, interests or activities (Adebisi & Yakubu, 2020). Aside the diagnostic criteria, it should be specified if (APA, 2013): 1) it is accompanied or not by intellectual impairment; 2) it is accompanied or not by language impairment; 3) it is associated with a known medical or genetic condition or environmental factor, it is associated with Another neurodevelopmental, mental or behavioural disorder. Also, the level of severity should be specified as: 1) Level 1: needs help; 2) Level 2: needs significant help; 3) Level 3: needs very significant help (APA, 2013).

Children in the special education classroom, who are diagnosed with ASDs, can possibly have been diagnosed in the early years, notably as characteristics of those disorders are shown before age five.

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Therefore, initial identification and assessment ought to have already occurred. If one is concerned in initial assessment, one could also be asked to document children's performance within the areas of language, social, academic, or adaptive behaviours. One might even be asked to complete rating scales describing children's behaviour within the area. If one is involved in the identification process, one will definitely be involved in ongoing assessment and evaluation. The dearth of this exercise within the classroom hinders the evaluation process and progress of children with ASDs in the areas of delay (Adebisi, et al., 2018).

### Statement of the problem

Wrong placement and instructions has also been the problem of teachers and professionals in their care and service delivery to these groups of children. Experience shows that in special schools or classes in Nigeria, specialists do confuse which groups of children exhibit characteristics that are specific to certain categories of disabilities. This confusion seems to lead to wrong placement and consequently to intervention that does not meet the needs of the children or equals wrong service provision. It is observed that parents do complain of no- change in the behaviour of their children, thereby resulting in them making incessant referrals/ changes of schools or centres where proper interventions could be sought. Hence, the focus of this study was to use an adapted screening instrument to identify Autism Spectrum Disorders (ASD) in school children.

The study had definite significance. Its significance was to single out such children that exhibit autistic characteristics from other children with developmental disorders, thereby give room for easy classification and intervention. Parents are also relieved of worries of how their children would be identified for proper placement and experience gradual and quick intervention. Another very important significance of this study was that it would be a source of contact and research base to the school professionals, parents and of course the prospective researchers in screening and identification processes.

The purpose of the study was to analyse the adapted screening instrument in identifying Autism Spectrum Disorders (ASDs) in school children for the purpose of placement and instruction. Using Childhood Autism Rating Scale (CARS), the scale is a behaviour rating scale designed to help differentiate children with ASDs from those with other developmental delays, such as mental retardation.

### Method

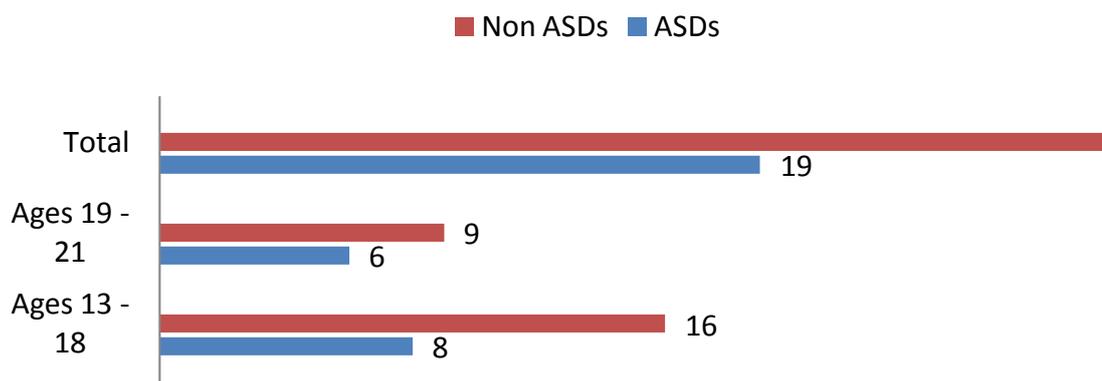
In order to identify Autism Spectrum Disorders (ASDs) traits from non-ASDs in school children using an adapted screening instrument. This study used descriptive research with design of cross-categorical survey (Creswell & Creswell, 2017; Sharif et al., 2011). This is a survey that studies a group of sample in order to identify traits of such group. The single group of subjects, where parents and teachers of the subjects were used as participants, was given questionnaires in form of rating scale to answer questions about the subjects. The researcher adapted behaviour rating scale called Childhood Autism Rating scale (CARS). CARS is a behaviour rating scale intended to help diagnose autism. CARS was developed by Eric Schopler, Robert J. Reichler, and Barbara Rothen Renner (Schopler, Reichler, DeVellis, & Daly, 1980; Schopler, Reichler, & Renner, 2010). The study was limited to a single special school (Abuja School for the Handicapped, Kuje, FCT. Abuja). The school comprised all categories of children with mental retardation, Autistic spectrum conditions, Down syndrome, learning disabled, cerebral palsy, physically handicapped and other developmental disabilities. The population for the study was 138. The researcher used 52 samples through purposive simple random sampling technique. The data of this study was analyzed with descriptive analysis with percentage (Allevi et al., 2013; Bryman & Cramer, 2011).

### Results and Discussion

**Research Question 1:** What are the ages of children with autism spectrum disorders and those without ASDs?

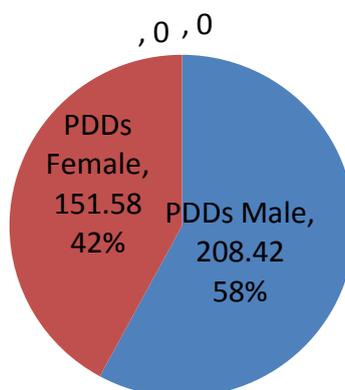
The Figure 2 hereby presents the data in form of pie graph. The chart showed that there was slight significant difference in the incidence of male samples exhibiting autistic characteristics traits using adapted CARS than female samples. The degree of 208.42, representing 58% of the circumference for male was higher than degree of 151.58, representing 42% of the circumference for female showed the high incidence of males with ASDs than that of females.

### Chart Showing the Ages of the Samples



**Figure 1.** Bar Graph of Ages of Subjects of Autism Spectrum Disorders (ASDs) and Non-ASDs

**Research Question 2.** What is the difference in the incidence of boys and girls with ASDs rated with CARS?



**Figure 2.** Pie chart of significance difference in the incidence of boys and girls with asds rated with childhood autistic rating scale.

**Hypothesis 1:** There is no significance difference in the correlation coefficient scores of parents and teachers using the adapted Childhood Autistic Rating Scale.

**Table 3.** Chi-square scores of parents and teachers using childhood autistic rating scale

Group	cal $x^2$	df	critical $x^2$
Parents			
Teachers			
Table value for $P < at$	0.38	1	3.84
0.05 level			

The result of the Chi-square of Goodness of fit test showing scores of parents' and teachers' ratings of the observed behaviour and their relationships is presented in table 3. The result of the chi-square scores of the parents' and teachers' ratings of the observed behaviours, reported in table 3 revealed no significant difference between the two ratings. This is evidenced from the fact that the calculated chi-square of 0.38 obtained was less than the critical chi-square of 3.84 using 2x2 contingency table showing the ratings of both groups. It meant that there was no significant reason to reject the hypothesis, so the hypothesis is retained. This implies that rating scores of parents using the adapted CARS show agreement with scores of teachers' rating and that CARS measures what it is intended to measure in identifying school children with ASDs by any users.

**Hypothesis 2:** There is no significant difference in the exhibited behaviour mean scores of children with ASDs and Non-ASDs using CARS.

**Table 4.** Mean scores of significance difference in the exhibited behaviours of children with ASDs and Non-ASDs.

Group	x	SD	df	calculated t	critical t
PDDs	36.53	50.45	42	1.09	2.000
Non – PDDs	23.52	23.52			

*Table value for P< at 0.05 level*

The result showed that the mean scores of samples with ASDs using CARS was 36.53 while the standard deviation was 50.45. Also mean scores of Non-ASDs using CARS was 23.52 while the standard deviation was 2.81, showing appreciable level of significant difference in the two scores. The result also showed the calculated t to be 1.09 and critical t to be 2.000 indicating that there was significant difference in the exhibited behaviour of children with ASDs and Non-ASDs using Childhood Autistic Rating Scale. This means that subjects rated as ASDs exhibited more of autistic characteristics that subjects rated as non-ASDs.

Results of the study indicated that there was no significant difference between the rating of parents and that of teachers using CARS (cal  $X^2 = 0.38$ , crit.  $X^2$ ,  $p < 0.05$ ). These results accorded well with that of Glascoe that revealed the correlation of scores of parents and professionals' rating in the use screening instruments in locating children with autism, and that the identification process is a parent-professional partnership which combines the observations of parents with the developmental knowledge of the professional, that is evident in the use of screening instruments, improves the efficiency of such instruments. Also, the use of CARS scores carried out by Schopler on 41 children supported this study that parents interviews were compared to scores derived from professionals. Mean scores under the two ratings were not significantly different and the correlation of  $r = .83$  further indicated good agreement. In addition, diagnoses based on parent rating and teacher observation agreed in 90% of the cases. The authors suggest that valid CARS ratings and diagnoses can be achieved through parent interview. From the forgoing, it is pertinent to stress that this present study prove similar to the earlier studies discussed in that all ratings were carries out under clinical settings that involved persons concerned/ worked directly with the children with ASDs. It is also very necessary to point out that the setting of this study may differ in drawing conclusions in that this study and earlier ones cited happened in separate locations. It is therefore suggested that this present study should be interpreted with caution pending the replicable study to confirm or disconfirm the results in similar settings or locations.

The results of the further showed considerable level of great significance between ASDs and Non-ASDs scores using CARS. The result was in agreement with other past studies (Szatmari et al., 2007) failed to conclude whether or not there have been significance difference within the exhibited behaviour of children with ASDs and Non-ASDs using correct screening instruments. They recounted that the aetiology of the disorder is believed to be largely genetic, however alternative medical causes need to be excluded so as to form a major distinction, particularly if there are further medical area or dysmorphic findings or on cether there is a history of regression or loss of skills (Coleman & Gillberg, 2012; Klin et al., 2007). Also, the findings of (Melke et al., 2008) discovered from the clinical perspective that there is typically problem within the medical diagnosis of ASD or those that are connected to it from variety of developmental process problems, especially severe and profound general developmental delay, language disorder and hyperkinetic and basic cognitive process disorders. Co-morbidity will additional complicate the diagnostic image, since ASDs will exist with hyperkinetic and basic cognitive process disorders, obsessional compulsive disorder and developmental disorders of motor performance, in addition to specific and general learning issues. Medical diagnosis will be significantly difficult in young children with severe and profound ASDs and in children with superior intelligence. This study slightly differs from the earlier cited studies, in that the adapted instrument utilized in this study failed to cause alternative queries that connected with the samples' description, medical milestones or extension of medical area or dysmorphic findings or on cether there is a history of regression or loss of skills. Existence of other severe or developmental delay failed to answer questions on the presence of ASDs within the sample. It is therefore encouraged that this study should be

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deduced on the confine of the already valid instrument that is meant identify specific characteristic traits of ASDs in school children with ASDs for the purpose of placement and intervention.

The results of the study also showed that there was slight major distinction within the incidence of male samples exhibiting characteristic traits using adapted CARS than female samples. The results of the finding failed to measure with the universal finding of the ratio 4:1 of incidence of ASDs in boys and girls. Countered the finding in its report that the ratio of boys girls diagnosed with ASDs (Dworzynski, Ronald, Bolton, & Happé, 2012; Klusek, Martin, & Losh, 2014; Lai et al., 2011).

In support with the organization, (Vaughn & Edmonds, 2006) opined that, in all ASDs is currently occurring at the rate of one in one thousand, and rates among the autism spectrum are predictable to be one in two hundred. They concluded that Rett's syndrome is found solely in females, but autism, Asperger's syndrome and childhood disintegrative disorder have higher incidences in males. Albeit, the incidence of boys with ASDs was over that of girls during this present study with the of 4:3 in favour of boys than girls, the result slightly dissect and may result to the little population/ samples used, which can not be sufficient to test or get the suitable sex ratio found in ASDs. The selection of single school in carry out the study also affected the agreement of the sex ratio with other earlier cited findings. It is pertinent to suggest that the future replicable studies should use the participation of large population/ samples for observation and rating that so that much significant sex ratio would be derived.

## Conclusions

The researcher concluded that (1) It was the considered view of the researcher that CARS should be used by parents and teachers to rate behaviour traits of children in order to identify those groups of children who exhibits characteristic traits that are specific to certain categories of disabilities, in this case ASDs, that lead to placement and consequently to intervention purposes. (2) The proper use of CARS would differentiate children with ASDs from other children who are most of the time in most school mainstreamed into a single class receiving the same instructions without really meeting their instructional needs, thereby making parents feel bad about their child slow progress in skill areas. (3) The users of CARS are informed to note and be aware of the incidences of ASDs in males than females. Previous researchers are aware of this in selection of population and subjects in their studies. (4) On the whole, it is safe to conclude that valid Childhood Autistic Rating Scale (CARS) is suggested for use in all special schools, centres/clinics to identify or differentiate pervasive developmental disorders from other developmental disabilities like mental retardation, Down's syndrome, cerebral palsy etc. To enable the effective use of the rating scale, the partnership of parents and professionals should be sought to rate the children in order to identify ASDs in such children.

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