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Assessment of visual acuity amongst school-aged students in Southern Cross River State, Nigeria

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Abstract:

BACKGROUND: Visual impairment is a major public health concern worldwide, with uncorrected refractive errors as a major cause of visual impairment in children. Most of the causes of this visual impairments can be prevented or easily corrected.

AIM AND OBJECTIVES: This study seeks to determine the prevalence of visual impairment and factors responsible for visual acuity screening amongst school-aged children in Southern Cross River State, Nigeria.

METHODOLOGY: This was a cross-sectional descriptive designed study using a multistage sampling technique, with a self-administered questionnaire to obtain quantitative data from school-aged children in secondary schools in Calabar Municipality, Southern Senatorial District of Cross River State in South-South Nigeria.

RESULTS: The mean age of respondents was 13.9 ± 2 years. The prevalence of visual impairment amongst students was 5.7%. Although majority of the respondents (73.9%) were aware of visual acuity screening test, only 33.9% of the respondents had ever had a visual acuity test done. A statistically significant association was found ($P < 0.05$) between those students who were aware of eye screening test, had their vision deteriorate or have their academic performance affected by their vision and the practice of performing an eye screening test.

CONCLUSION: Awareness of visual acuity screening did not translate into practice, so it is necessary for visual acuity screening test to be made mandatory for all school-aged children to help detect visual impairment early.

Keywords:

Calabar, Nigeria, school-aged children, visual acuity

Introduction

Globally, at least 2.2 billion people are visually impaired or blind, of which at least 1 billion have a vision impairment that could have been prevented or is yet to be addressed.[1] Uncorrected refractive error is a leading cause of visual impairment in children worldwide.[2] More than 20 years since the launch of VISION 2020, a global initiative by the World Health Organization that aims to eliminate the main causes of all preventable and treatable blindness as a public health issue by the year 2020,[3] uncorrected refractive error is still a leading cause of visual impairment in children worldwide.[2] Furthermore, the prevalence of distance vision impairment in low- and middle-income regions is estimated to be four times higher than in high-income regions.[4] In Nigeria, uncorrected refractive errors are the most common cause of mild and moderate visual impairment.[5]

Visual acuity provides an estimate of an observer's ability to perceive spatial detail and is the most commonly used measure of visual function in clinical practice. Tests

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of visual acuity provide information that can be used to determine the presence or absence of refractive error and pathology within the visual pathway. These tests are often considered to be amongst the most important measures of general visual function.[6] Refractive error affects a large population of the world irrespective of age, sex or ethnic group. If not corrected, it becomes a major cause of visual impairment and even blindness.[7] Visual impairment due to refractive error is the most common cause of eye disease and is a significant cause of morbidity in children worldwide.[8]

School age group is an important stage or period of life for development of a child, and it is imperative to assess their visual acuity for early recognition and appropriate referral.

Visual impairment has a drastic impact on school performance of school-aged children because 75%–90% of general classroom learning is wholly or partially through vision,[9] any form of visual impairment may have a negative effect on learning and social interaction, which may affect the natural development of academic and social abilities in children.[9,10]

Many eye diseases are 'silent' or asymptomatic while serious ocular damage is ongoing. With basic eye assessment, such conditions may be identified and treated. About 10%–15% of the cases of blindness in children are considered preventable or avoidable and treatable.[11] Approximately 700 million adult blindness yearly are caused by childhood blindness which would have been prevented.[12]

This study seeks to determine the prevalence of visual impairment and factors responsible for visual acuity screening amongst school-aged children in Southern Cross River State. It is hoped that the result of this study will be used by the government to plan for the implementation of an eye health programme in secondary schools, and data from this study will provide baseline information for further research.

Methodology

This was a cross-sectional descriptive designed study amongst school-aged children in secondary schools in Calabar Municipality, Southern Senatorial District of Cross River State in South-South Nigeria.

There are 52 registered secondary schools, 35 private schools and 17 government schools.[13] After correcting for non-response, a multistage sampling technique was used to select 330 respondents from across the 52 secondary schools.

The tool for data collection for this study was a self-administered structured questionnaire and Snellen chart. The questionnaire had sections on sociodemographic data of students, awareness of visual impairment, sources of information on visual acuity screening test and eye care practice.

An alphabet Snellen chart was placed on the wall at a distance of 6 m from students in a well-illuminated classroom; visual acuity was measured one eye at a time. Each student stood and faced the chart and then read out the letters on the chart started from the biggest letters to the smallest readable letters. The eye not being measured was covered with the palm of the hand without pressure. The same procedure was repeated for the other eye and the results recorded.

For the purpose of this study, the following operational definitions were used: normal visual acuity was any presenting visual acuity between 6/6, 6/9 and 6/12, and poor or impaired visual acuity was any presenting visual acuity worse than 6/12.[14] Respondents with visual impairment were referred to University of Calabar Teaching Hospital for further evaluation and treatment.

Pretesting of the questionnaire was conducted amongst school-aged children in secondary schools in a similar sociodemographic setting before use for data collection.

The questionnaires returned were inspected to detect errors and omissions and to ensure completeness of entry. Questionnaires were manually sorted, coded before entry and cleaned following entry into the computer for statistical analysis using the Statistical Package for the Social Sciences (SPSS version 21 (IBM Corp, Armonk, NY)). Data analysed were presented in tables and charts. Chi-square was used to test for statistically significant associations between categorical variables, and the level of significance was set at 0.05.

Results

Three hundred and thirty secondary school students in Calabar Municipality were studied, and the response rate was 100%.

Table 1 shows that the mean age of the students was 13.9 ± 2 years; majority of the respondents were female (191, 57.9%), of Efik tribe (99, 30%) and Christians (320, 97%).

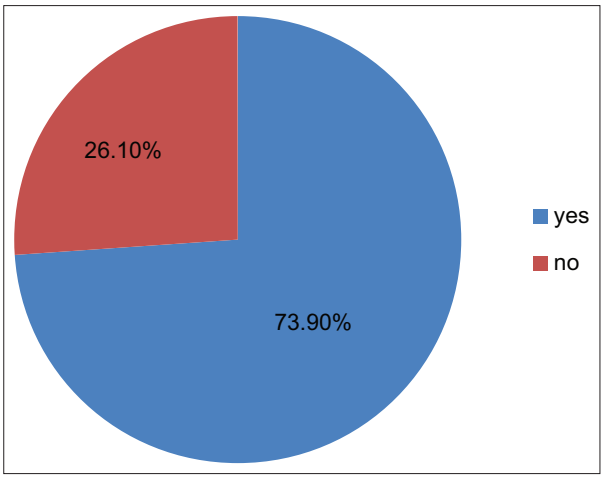

Figure 1: Awareness of students on eye screening

Respondents' level of awareness regarding eye screening test

Figure 1 shows that most of the students (244, 73.9%) were aware of eye screening test while a few (86, 26.1%) were not aware.

Sources of information regarding eye screening test

Figure 2 shows the sources of information regarding eye screening. For majority of the students (92, 27.9%), this was mass media: television (54, 16.4%), radio (24, 7.3%) and newspaper (14, 4.2%). Other sources of information were school (55, 15.7%), hospital (49, 14.8%) and from families/neighbours (48, 14.5%).

Eye care practices amongst respondents

Table 2 shows that only about one-third of the students (112, 33.9%) had ever had their visual acuity screening test done. About half of these students (55, 49.1%) had their visual acuity done before admission into the school, while 57 (50.1%) had it checked while in school.

Prevalence of visual impairments amongst respondents

Table 3 shows that 5.7% of the respondents had visual impairment.

Factors associated with visual acuity screening amongst respondents

Table 4 shows a statistically significant relationship between awareness of eye screening test, deterioration of vision or academic performance affected by vision and having a visual acuity screening done ($P < 0.05$).

Table 1: Sociodemographic characteristics of respondents

Variables	Frequency (*n*=300), *n* (%)
Age (years)	
<11	36 (10.9)
11-15	207 (62.7)
16-20	86 (26.1)
21-25	1 (0.3)
Sex	
Male	139 (42.1)
Female	191 (57.9)
Class	
Js1	58 (17.7)
Js2	46 (13.9)
Js3	45 (13.6)
Ss1	88 (26.7)
Ss2	48 (14.5)
Ss3	45 (13.6)
Tribe	
Efik	99 (30.0)
Ibibio	69 (20.9)
Igbo	41 (12.4)
Others	121 (36.7)
Religion	
Christianity	320 (97.0)
Islam	5 (1.5)
Others	5 (1.5)

Table 2: Practice of visual acuity screening test among respondents

Variables	Frequency, *n* (%)
History of visual examination	
Yes	112 (33.9)
No	218 (66.1)
Total	330 (100.0)
If yes when (*n*=112)	
Before admission	55 (49.1)
While in school	57 (50.9)
Place eye test was done (*n*=112)	
Health centre	23 (20.6)
General hospital	25 (22.3)
Teaching hospital	31 (27.7)
Private clinic	33 (29.5)

Discussion

This study assessed the prevalence of visual impairment and factors responsible for visual acuity screening amongst school-aged children in Southern Cross River State.

The prevalence of visual impairment in this study was found to be 5.7%. This is comparable with various studies done in different part of Nigeria[8,15-17] and in a study done in Brazil,[18] however it was much lower than the prevalence gotten from a study done in Nnewi, Nigeria.[19] This difference could be due to their using a cut-off of <6/6 as poor vision.

In this study, most of the respondents (73.9%) were aware of the screening test for visual acuity, and the major

Table 3: Prevalence of visual impairments among respondent

Variables	Frequency (*n*=300), *n* (%)
VA right eye	
6/6	220 (66.7)
6/9	61 (18.5)
6/12	19 (5.8)
6/18	13 (3.9)
6/24	12 (3.6)
6/36	5 (1.5)
VA left eye	
6/6	224 (67.9)
6/9	45 (13.6)
6/12	31 (9.4)
6/18	18 (5.5)
6/24	9 (2.7)
6/36	3 (0.9)
VA both eyes	
6/6	253 (76.7)
6/9	41 (12.4)
6/12	17 (5.2)
6/18	11 (3.3)
6/24	5 (1.5)
6/36	3 (0.9)
VA both eyes	
Good vision ≥6/12	311 (94.3)
Poor vision <6/12	19 (5.7)

VA: Visual acuity

Table 4: Factors associated with visual acuity screening test among respondents

	Ever done VA		Chi-square test	*P*
	Yes (112)	No (218)		
Awareness of eye screen				
Yes	100	144	20.722	0.005
No	12	74		
Has your condition worsened				
Yes	51	65	8.020	0.005
No	61	153		
Affect academic performance				
Yes	29	20	16.356	0.000
No	83	198		
Visual acuity of both eyes				
Good	76	176	12.197	0.06
Poor	36	42		

VA: Visual acuity

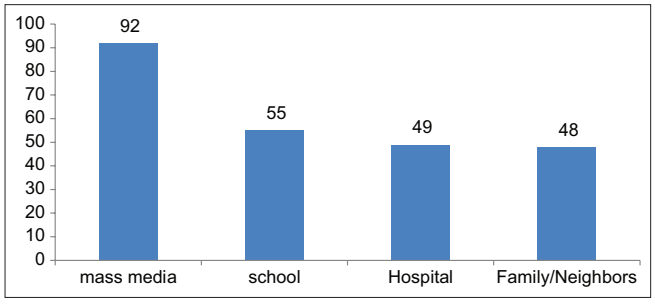

Figure 2: Sources of information of students regarding eye screening test

source of information for the visual acuity screening test was mass media (27.9%), but this awareness did not translate into practice as only 33.9% of the students had ever had a visual acuity done despite 5.7% of the respondents having poor vision There is a need for the government to make visual acuity screening test compulsory for students at least once every school year and medical fitness examinations to include visual acuity test as a prerequisite for admission into schools in order to enable early detection and treatment of visual impairment.

Conclusion and recommendation

Even though awareness of visual acuity screening in this study was high 73.9%, this awareness did not translate into practice.

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Conflicts of interest

There are no conflicts of interest.

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