

Visual Health Status and Visual Impairment among Students in Uyo, Akwa Ibom State Nigeria

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ABSTRACT

The purpose of this study was to determine the visual health status, causes of visual impairment and the prevalence of eye disease among students in Uyo metropolis. Five specific objectives and five research questions were formulated to guard the study. A Quasi-experimental research design was used in the study involving two public and one private secondary schools located in Uyo metropolis. Structured questionnaire was used to collect data as well as clinical examination of the eyes of the students who fulfilled the inclusion criteria and data so generated were analyzed using frequency counts and non parametric statistics. The sample for the study was made up of 419 students, 152 were males and 261 were females. The findings of the study indicated that, testing using chi-square analysis revealed a poor visual health status of majority of the students is caused by refractive error and the prevalence of visual impairment is high among the students, therefore there is need to take appropriate steps to mitigate its effect on the academic performance of these students and their in future. It is recommended that teachers should be trained and equipped for vision screening of their students, pre-school regular eye screening of students including a proper referral chain for students so identified with eye problem should form part of the school health programmers.

Key Words; Visual Health Status, Visual Impairment

INTRODUCTION

Visual disorders represent one of the most common disabling and handicapping conditions in children (Rabindran, 2016) Visual disability at an early age impairs the development of motor skills, cognition, and language during significant period of child development low visual acuity (VA) may affect several areas of child development related to skills mediated by vision (Gupta, Gupta, Chanhnan, & Bhardwaji, 2009). When the vision is poor, routine schoolwork and day to day activities also get affected (Mahesh, Kim John, Rose, & Paul, 2019). Learning difficulties affect academic performance, can lead to academic failure, and are experiences by the students as a wound that affects their self-esteem, according them negative status in school and as a result, society, whereas school is supposed to be a place for positive development and growth. This is also the more true for teens that are searching for their identity and place in society, and for those living in disadvantaged socio-economic conditions.

Furthermore, with entry into the job market coming at an increasingly later age, the key role that schools play in a teenager's life extends over an even longer periods of time since 2009, the committee on children with disabilities, American Academy of Paediatrics, American Academy of Ophthalmology and American Association for Paediatric ophthalmology and strabismus have recognized that "vision problems can interfere with the learning process" (AAPOS, 2009). The magnitude of visual disorders among school age children in Nigeria is yet to be quantified. Various studies show that ocular morbidity is a public health problem (Alakiya 1995). Researchers in Ile-Ife, southwest Nigeria, reported 49 percent of secondary school students participating in a screening exercise, to have allergic conjunctivitis; six percent had infective

conjunctivitis (Adeghingbe, Oladehinde, Majemgbasan, Onakpoya, & Osagiede, 2005). More females than males had one form of ocular disorder or the other. Among those with allergic conjunctivitis. Only 12.5 percent had visited an eye specialist prior to conducting the research (Nwachukwu, and Archibong 2021).

About 1.4 million children worldwide are blind, of which approximately 33 percent live in Africa (Chadna and Gilbert, 2010; World Health Organization 2001, 2013, 2018 & 2020). Each year, an estimated half a million children become blind, of whom 60 percent die in childhood. Notable among the causes of blindness and visual impairment among children are refractive errors, vitamin A deficiency, congenital cataract, corneal scarring from measles, use of harmful traditional eye remedies and microbial substances (Guinn and Gilbert, 2011). Although the proportion of infants and school-aged children with visual impairment is less than five percent of individuals with visual impairment worldwide, after adjustment for disability – adjusted life years (DALYS) (Sun, 1999, Song, Wang, Wei, Chang, Wang, & An, 2017).). In addition, health habits formed during this period is often carried on to adulthood and passed to the next generation, which can be largely influenced by their perception and attitude toward disease conditions when in school. The control of visual impairment and blindness in children was a priority of the world health organization's vision 2020 program (Gilbert and Foster, 2001). Adolescents account for a significant proportion of the world's population today and in Nigeria, they constitute about 45 percent of the population with about 15-20 percent being within the age of 10-18 years (Chuka-Okosa 2005).

Several surveys have demonstrated the importance of the early diagnosis of visual problems as an essential means of minimizing and preventing severe problems in the future, including amblyopia and strabismus (Li, He, Cheri, Zhu, Zon & Xu, 2018). Knowledge of eye diseases affords individuals the ability to recognize them and seek for a comprehensive eye examination in times of need. High level of knowledge aids health promotion activities and leads to better outcomes. Little knowledge on the other hand, may be a cause of limited use of available eye care services. Maurya, Srivasta, Singh, Mishra, & Al-mujaini, (2019) reported gaps in communicating information about eye conditions as well as failure to conduct routine eye screening. Since school children are likened to a captive population and so are relatively accessible for screening. Assistance to a child with visual problems ought to be easy and early, but this is not the case in the developing countries as noted in Nigeria and more specifically Akwa Ibom State. Therefore the need for this study.

STATEMENT OF THE PROBLEM

Vision is such an important part of learning and experts believe that about 75-90 percent of what children learn in school comprised visually presented information (Padhye et al 2009). It thus means that clear vision is necessary for students to reach their full potential. Visual disability at an early age impairs the development of motor skills, cognitions, and language during significant periods of a child's development. Low visual acuity may affect several areas of child development related to skills mediated by vision.

Ophthalmologic disorders like refractive errors, conjunctivitis, congenital/developmental cataract. Vitamin A deficiency and strabismus serve as a major cause of limitations at school. It has been shown that implementation of programmes for the detection of low visual acuity and prevention of ophthalmic problems in developed countries have significantly lower costs than the costs of the treatment of patients with eye disorders. Unfortunately, in the developing countries like Nigeria, socioeconomic and cultural factors prevent or hinder children from having access to ophthalmologic examination before school entry. The public health system in these developing countries does not also provide children with easy access to such examination (Anugwom and Awofeso 2020).

It has been observed that many children go about with unidentified preventable/treatable ocular problems that may lead to blindness in later years. There are no established school vision assessment programmes in the state which would have made it possible for such children to be identified and attended to early in life.

and thus improve their visual status. This researcher has in the course of the practice noted that the knowledge of the importance of good visual health and causes of poor visual health is very low among this school age group. Given the importance of good vision in the learning process, the poor premium people generally put on eye health and the lack of research work done in this area in our environment. This research sought to verify the visual health status and prevalence of visual impairment in the target population and also provide some needed data for health education/intervention purposes.

Purpose of the Study

The purpose of this study was to determine the visual health status and visual impairment among students in Uyo. The specific objectives of this study included;

1. To determine the ocular health status of secondary school students in Uyo metropolis.
2. To determine the pattern of visual impairment among secondary school students in Uyo metropolis.
3. To determine the causes of visual impairment as seen among public and private secondary school students in Uyo metropolis.
4. To determine the visual acuity of secondary school students in Uyo metropolis.
5. To determine the number of students with refractive errors among secondary school students in Uyo metropolis.

Research Questions

1. What is the ocular health status of secondary school students in Uyo metropolis?
2. What are the patterns of visual impairment (vi) and blindness among secondary school student in Uyo metropolis?
3. What are the causes of poor visual health among public and private secondary school students in Uyo metropolis?
4. What is the visual acuity of secondary school students in Uyo metropolis?
5. How many of the students have refractive errors?

RESEARCH METHOD

Design of the Study

Quasi –experimental Ex-post factor research design was used in this study where groups with qualities that already exist are compared with dependable variables.

Area of the Study

The study was conducted in Metropolis Uyo, on latitude $5^{\circ}03'4.57''\text{N}$ and longitude $7^{\circ}56'0.60''\text{E}$, is a city in South-south, Nigeria. It is the capital of Akwa Ibom State, a major oil producing State in Nigeria. They city became capital of Akwa Ibom State from old Cross River State. (Ogende, 2005). You falls within the rain forest zone of Nigeria with a mean annual rainfall of 2434.9 mm. It shares boundaries with Abak, Etinan, Ibesikpo-Asutan, Ibiono Ibom, Itu, Nsit-AAtai and Uruan Local Government areas. Temperatures are uniformly high throughout the year with the maximum rang of $31^{\circ}\text{--}33^{\circ}\text{C}$ and minimum of $25^{\circ}\text{--}27^{\circ}\text{C}$ (Inyang, 2000). The population of Uyo, according to the 2006 Nigerian census was 436, 606. The inhabitants are predominantly of the Christian faith and Ibibio is the most widely spoken indigenous language, together with other languages such as Annang, Oron and Andoni. With the rapid growth of the city, there is a good population of Igbo, Yoruba and Hausa speaking persons residing in the city. The major occupations of the people include those in civil services, company workers, artisans, trading and farming. Uyo was selected because as the State capital, it has the representation of all the local government areas of

the state.

Population of the Study

The study population was drawn from two public and one private secondary schools located in Uyo metropolis. The two public schools had a total 13,621 students while the private study comprised senior secondary 2 students (SS2) from two public and one private schools in Uyo metropolis with a total population of 712 student in public school and 85 student in the private School Secondary Education Board 2019).

Sample and Sampling Technique

The sample was 419 students representing 29.4% of the students in the three schools. The three schools were selected by simple random sampling and had a total population of 14, 108 students of this, 1,424 were in SS2 class. A multi-stage sampling technique was used to select the participants for the study.

Instrumentation

Structure questionnaire was used to collect data as well as clinical examination of the eyes of the students who fulfill the inclusion criteria. The questionnaire was divided into three sections. Section A on demography, section B was based on dependent and independent variables and sections C contained the record of the ocular measurements of the student.

The clinical examination involved the used of an alphabet Snellen's chart which was hung on a wall at a distance of 6 metres from the students in wall-lit walk way/classroom, and at a height of 2 meters. Visual acuity was measured one eye at a time (monocularly) with each student standing and facing the chart, and then reading out the letters on the chart starting from the biggest one to the smallest readable letter. The eye not being measured was covered with an occlude that was held in place by the trial frame for the purpose of this study, the following operational definitions of the various visual acuities will be used:

Normal visual acuity = 6/6 and better Poor/impaired visual acuity 6/9 and below

Method of Data Collection

The researcher visited the schools chosen on the day agreed with the principal. Written informed consent was obtained from the student and principal while oral consent was obtained from the class teacher. The questionnaire was both self-administered and interviewer-administered and the service of two trained research assistants was engaged for this purpose. Research assistant were also involved in the assessment of visual acuity while details eye examination was carried out by the researcher and results documented.

RESULTS

Research question 1

What is the ocular health status of secondary school students in Uyo metropolis?

Table 1: Presenting visual acuity (VA) in the right eye (RE) and left eye (LE) among secondary school students in Uyo

Presenting VA	RE N=419 (%)			LE N=419 (%)		
	Male n=152 n=267	female	Total n=152 n=267	Male	Female	Total
>6/6	144(34.4)	239(57.0)	383(91.4)	141(33.7)	252(60.1)	393(93.8)

6/9	3(07)	13(3.1)	16(3.8)	3(0.7)	2.(05)	5(1.2)
6/12	2(0.5)	4(0.9)	6(.4)	3(0.7)	3(0.7)	6(1.4)
6/18	1(0.2)	4(0.9)	5(1.2)	3(0.7)	4(1.0)	7(1.7)
6/24	1(0.2)	2(0.5)	3(0.7)	1(0.2)	3(0.7)	4(1.0)
6/36	2(0.5)	2(0.5)	4(1.0)	0(0.0)	3(0.7)	3(0.7)
6/60	0	0	0(0)	0(0.0)	0(0.0)	0(0.0)
3/60	0	1(0.2)	1(0.2)	1(0.2)	0(0.0)	1(0.2)
CF	0	1(0.2)	1(0.2)	0(0.0)	0(0.0)	0(0.0)

Source = filed data (2020)

Table 1: Shows that 383 (91.45%) [144 males and 239 females and 393 (93.8%) [141 males and 252 females] students had VA 6/6 or better in the RE and LE respectively. Twenty seven (6.4%) [9 males and 18 females] and 18(4.3%) [9 males and 9 females] had VA between 6/9-6/18 for RE and LE WHILE, 8(1.9%) [2 males and 6 females] had VA between 6/24-3/60 for either eye' and 1(0.2%) [1 female] had a VA of counting finger in the RE.

Table 2: Visual acuity aided with pin-hole in the RE and LE in secondary schools in Uyo Metropolis

VA WITH PIN HOLE	RE n=419(%)	LE n=419(%)
6/6	18(4.3)	13(3.1)
6/9	6(1.4)	3(0.7)
5/12	3(0.7)	2(0.5)
6/18	3(0.7)	4(1.0)
6/24	1(0.2)	—
No improvement with pinhole	5(1.2)	4(1.0)
No need for correction	383(91.4)	393(93.8)
<u>Total</u>	419(100)	419(100)

Source = field data (2020)

Table 2: Shows that with pinhole 18(4.3%) and 13(3.1%) improved to 6/6 in the RE and LE respectively. Twelve (2.8%), 9(1.2%) had improvement to 6/9-6/18 in the RE and LE respectively whole 1(0.2%) had improvement to 6/24 in the RE. five (1.2%) in the RE and 4(1.0%) in the LE had no improvement with pinhole, while 383(91.4%) RE and 393(93.8%) LE had no need for aided visual acuity i.e they had good vision.

Table 3: Ocular diagnosis both eyes in secondary school students in Uyo Metropolis

Diagnosis	N=419	%
Healthy eyes	318	75.9
Suspicious disc	28	6.7
Refractive error only	27	6.4
Allergic conjunctivitis	16	3.8
Ref error other pathology	12	2.9

Albinism	4	1.0
Photophobia	4	1.0
Sub conj hemorrhage	2	0.4
Corneal opacity	2	0.4
Chorioretinal cart retinopathy	2	0.4
Developmental cataract	1	0.2
Floater	1	0.2
Traumatic conjunctivitis	1	0.2
Chalazion	1	0.2
Total	419	100

Source = field data (2020)

Table 3: Shows that 318(75.9%) of the students had healthy eyes, 28 (6.7%) had refractive error only, 16(6.4%) had allergic conjunctivitis while 12(2.9%) had refractive error with other ocular morbidities four (1.0%) had albinism with refractive error

Tables 1 to 3 answer the research question 1 which has shown that 383 (91.4%) RE 393 (93.8%) LE of the students had visual acuity 6/6 or better, 28(6.7%) had suspicious disc, 27(6.4%) had mild visual impairment, 8(1.9%) had moderate visual impairment while 1(0.2%) was blind in the RE.

Research question 2

What are the patterns of visual impairment (VI) and blindness among secondary school students in Uyo metropolis?

Table 4.: Patterns of visual impairment (VI) in the different sexes and secondary schools in Uyo metropolis

RE	Mild VI (%)	Moderate vi	Severe Vi	Blindness
Male	6(22.2)	3(42.9)	0(0.0)	0
Female	21(77.8)	4(57.1)	1(100)	1(100)
Total	27(100)	7(100.0)	1(100.0)	1(100.0)
Public school	26(96.3)	6(96.3)	1(100)	1(100)
LE				
Male	9(50.0)	1(14.3)	1(100)	0(0.0)
Female	9(50.0)	6(85.7)	0(0.00)	0(0.0)
Total	18(100)	7(100.0)	1(100.0)	
Public	15(83.3)	5(71.4)	1(100)	0(0.0)
Private	3(16.7)	2(28.6)	0(0.0)	0(0.0)

Source = field data (2020)

Table 4. shows that in the RE, more female students had mild 21(77.8%) and moderate 4(57.1%) visual impairment than the male students 6(22.2%), 3(42.9%) respectively and the only case of severe VI and blind eye was seen among the female students. Also 26 (96.3%), 6(96.3%) students in public school had mild and moderate VI respectively; while 1(3.7%) each had mild and moderate VI among the students in private school. Cases of severe VI and blindness were seen only among students had equal number of cases of mild

VI 9(50%) but more female students 6(87.7%) had cases of moderate visual impairment than the male student 1(14.3%) and the only case of severe VI was seen in male students. Public school students had 15(83.3%) cases of mild VI, 5(71.8%) moderate VI and 1(100%) of severe VI while 3(6.7%), 2(28.6%) cases of mild and moderate VI respectively were seen in students in private school overall prevalence of visual impairment in the worse eye (RE) was 8.4% and better eye (LE) was 6.2%.

Research question 3

What are the cause of poor visual health among secondary school students in Uyo metropolis?

Table 5: Frequency distribution of presenting visual acuity in the RE with diagnosis of secondary school students in Uyo metropolis

Diagnosis	Better	6/6	6/9	6/2	6/18	6/36	6/60	3/60	Cf	Total n=419(%)
Health eyes	0	295	12	4	5	2	0	0	0	318(75.9)
Suspicious disc	0	26	0	1	0	1	0	0	0	28(6.7)
Refractive error only Allergic	0	12	6	5	3	1	0	0	0	27(6.4)
Conjunct/VKC	16	12	6	5	3	1	0	0	0	16(3.8)
Ref error + other Pathology	0	3	5	3	1	0	0	0	0	12(2.7)
Albinism +	0	0	0	1	1	1	0	1	0	4(1.0)
Photophobia	4	0	0	0	0	0	0	0	0	4(1.0)
Subconj Hemorrhage	1	1	0	0	0	0	0	0	0	2(0.5)
Corneal opacity	0	0	1	0	1	0	0	0	0	2(0.5)
Chorioretinal Scar + Rerinopathy Developmental	0	0	0	0	0	1	0	0	1	2(0/5)
Cataract	0	0	0	0	0	1	0	0	0	1(0.2)
Floaters	0	0	0	0	0	1	0	0	0	1(0.2)
Traumatic	1	0	0	0	0	0	0	0	0	1(0.2)
Conjunctivis				0						
Chalazion- Suspicious disc	1	0	0	0	0	0	0	0	1	1(0.2)
Total	345	28	18	14	8	0	1	1	419	(100)

Source = filed data (2020)

Common diagnosis among the students were glaucoma suspect 28(6.7%), refractive error 27 (6.4%), allergic conjunctivitis 16(3.8%) refractive error+ other pathologies 12(2.9%), albinism 1 refractive error 4(1.0%), photophobia 4(1.0%).

Table 6: Ocular complaints of secondary school students in Uyo metropolis

Eye Complaints of Students	Yes n (%)	No n (%)
Itching	251(59.9)	168(40.1)
Eye pain	247(58.9)	172(41.1)
Water from eye	245(58.5)	174(41.5)
Hit RE/LE before	241(57.5)	178(42.5)
Redness	161(38.4)	258(61.4)

Doubles vision	117(27.9)	302(72.1)
Word jump	170(40.6)	249(59.4)
Skip word	196 (40.6)	223(53.2)
Bright light	316(75.4)	103(24.6)
Avoid reading	211(28.9)	298(71.0)
See chalk board	255(60.9)	164(39.1)

Source = field data (2020)

Table 7: Shows that the commonest complain was itching 251(59.9%), followed by eye pain 247(58.9%) tearing 245(58.5%) and redness 161(38.4%). Two hundred and fifty five (60.9%) students admitted they could see the chalk board well while 164 (39.1%) said they could not see the chalk board well.

Tables 4.5 & 6.7 answer research question 3 which shows that commonest ocular diagnosis among secondary school students were refractive errors suspicious discs, allergic conjunctivitis and albinism while the commonest complaints were itching, eye pain, tearing and redness.

Research question 4

What are the causes of blindness among secondary school students in Uyo metropolis?

Table 8: show that the chorioretinal scar was the cause of the only case of blindness seen among the students.

Research question 5

How many of the students had refractive errors?

Table 9: Prevalence of refractive error among secondary school students in Uyo metropolis

Diagnosis	n=419	(%)
Refractive error only	27	6.4
Refractive error + Albinism	3	0.7
Refractive error + Allergic Conjunctivitis	7	1.7
Refractive + ptosis	4	1.0
Refractive error + retinopathy	1	0.2
Others	377	90.0

Source = field data (2020)

Table 9 shows that a total of 42 (10%) students had refractive error of this, 27(6.4%) students had refractive error only, while 15(3.6%) had refractive error with other eye problems.

FINDINGS

The following findings emerged from the study based on research questions

1. Where as majority of the students in secondary school have good visual health, a significant number had ocular problem and sought medical attention but self-medication was still an option to some.

2. The pattern of visual impairment differed between sexes and schools.
3. The commonest cause of visual impairment was refractive error while the commonest complaints were itching eye pain and what from eyes.
4. Common causes of poor visual health among secondary school students in Uyo metropolis include suspicious disc, refractive error, allergic conjunctivitis, refractive error with other pathologies, albinism and photophobia and the only of blindness among these students was caused by chorioretinal scar.
5. A larger percentage has never had any eye examination done before entering school or as a part of medical checks

CONCLUSION

Based on the findings of the study, it was concluded that poor visual health status of majority of the secondary school students was caused by refractive error and prevalence of visual impairment was high among the students. Furthermore the refractive error conditions and other causes of visual impairment can be treated and resulting blindness prevented if early pre-school eye screening is initiated to mitigate their effect on the overall well-being of the students.

RECOMMENDATIONS

1. Since school based screening enjoys more patronage, teachers should be trained and equipped for vision screening. To do this, ophthalmological society of Nigeria should be involved in the training of teachers by developing basic eye health manual for their training and such trained teachers should be equipped by the ministry of education for vision screening of their students. This hopefully will save enormous amount of time and energy of the eye care staff, reduce their work load and provide a wider coverage of eye care services for children.
2. Cases picked up by teachers can be double checked by ophthalmologists in the eye care team.
3. Arrangement should be made by the school health services department for such identified students to receive necessary medical attention as part of the service chain as this will go along way in preventing blindness among them and thus reduce the burden of blindness in the society children have longer blind years.
4. There is an urgent need to revive the school health programme by the ministry of health/ministry of education, under the auspices of the school health services where routine medical/eye examination of children at school entry, and at regular intervals thereafter until completion will be carried out.
5. Increased awareness on the importance of pre-school and regular eye screening for children and students should be created by the ministry of education/ministry of health.

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