Original Article

KNOWLEDGE OF GLAUCOMA BLINDNESS AMONG STUDENTS OF AMBROSE ALLI UNIVERSITY, EDO, STATE, NIGERIA.

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Abstract

Aim: This study assessed knowledge of glaucoma blindness, knowledge of risk factors and practice of preventive measures of glaucoma among undergraduate students of Ambrose Alli University Ekpoma, Edo state, Nigeria.

Methodology: This descriptive study was carried out amongst 221 respondents, selected using multistage sampling technique. Interviewer administered questionnaires were used for data collection. Data was analyzed using IBM SPSS version 21.0 software for descriptive statistics. The Chi square test was used to test for association, the level of significance was set as $p < 0.05$.

Results: Out of 221 respondents, only 13% had good knowledge of glaucoma while 87% had poor knowledge. Only 6% had good knowledge of risk factors of glaucoma and 94% had poor knowledge, while 39% of respondents had good practice of preventive measures of glaucoma blindness and 61% had poor practice of preventive measures of glaucoma. There was a statistical significance between knowledge of glaucoma and the level of study in the nursing department ($p<0.001$).

Conclusion: Knowledge of glaucoma blindness was low among the respondents. The findings of this study stress the need for effective information and education about glaucoma.

Keywords: Glaucoma, Blindness, Knowledge, Undergraduates.

Introduction

Blindness is one of the most tragic yet often avoidable-disabilities in the developing world.[1] Actions by individuals, families and communities, as well as eye care professionals, are vital to achieving the ambitious target of "Vision 2020: the right to sight", which aims to prevent 100 million cases of blindness by the year 2020.[2]

In the 10th revision of the WHO International Statistical Classification of Diseases, Injures and causes of Death, 'low vision' is defined as visual acuity of less than 6/18 but equal to or better than 3/60, or a corresponding visual field loss to less than 20 degrees, in the better eye with the best possible correction. 'Blindness' is defined as visual acuity of less than 3/60, or a corresponding visual field loss to less than 10 degrees, in the better eye with the best possible correction. 'Visual impairment' includes both low vision and blindess.[3]

Glaucoma is an important cause of irreversible blindness. It causes irreversible defects in the visual field and can lead to total blindness when left untreated.[4] Glaucoma is a group of optic neuropathy with a characteristic optic nerve head cupping and visual field defect with increased intraocular pressure as a major risk factor.[5] Glaucoma can be classified broadly into primary

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and secondary glaucoma with angle closure glaucoma (ACG) and open angle glaucoma (OAG) being the most common types.[4,6]

Glaucoma is a global public health problem, because it is the highest cause of irreversible blindness and the second leading cause of blindness after cataract.[4,6] Quigley reports that glaucoma is undiagnosed in nine out of ten affected people globally.[4] High glaucoma morbidity among some African communities may be attributed to low awareness, under-utilization of eye care services as well as limited availability of treatment procedures.[7,8,9,10,11] Several studies have reported low levels of glaucoma awareness. Unfortunately, there are limited efforts directed at awareness creation of glaucoma in Africa.[8]

Glaucoma is the second leading cause of blindness after cataract and it's therefore a global public health problem. It is estimated that over 65million people throughout the world are affected by glaucoma and many (50%) of the affected people are unaware of their condition.[4] For people to present to eye care providers, they need knowledge about glaucoma and the benefits of early detection and treatment.[10] Published evidence indicates that late diagnosis of glaucoma is an important risk factor for subsequent blindness and is associated with poor knowledge about the condition.[12]

The World Health Organization estimates that 105million people are glaucoma suspects, about 13. 5 million people over the age of 40years have primary open angle glaucoma (POAG) which constitutes 60% of the total burden of the disease, 6 million (26.6%) people have primary angle closure glaucoma (PACG), 300,000 children (1.3%) have congenital glaucoma and 2.7 million individuals (12.1%) are affected with secondary glaucoma. Globally, approximately 70% of POAG cases belong to developing countries.[13] The number of people with primary glaucoma in the year 2000 was estimated to be 66.8million with 6.7million subjects suffering from bilateral blindness.[14]

Past trends in the disease prevalence reveal that between the year 2000 and 2013, over 60million people in the world had glaucoma.[4,14] The prevalence of the disease is however projected to further increase as the global population increases in both age and number. Future projections of glaucoma cases reveal that about 76 to 80million people will develop the disease by the year 2020.[4] This will further upsurge to about 118.8 million people by the year 2040 globally.[9]

Africa is estimated to have the highest glaucoma prevalence of 4.79 as compared to 2.93 in Europe and in Asia.[15] Previous studies from Africa have reported low level of awareness and knowledge of glaucoma among Nigerians.[10,16] There are limited efforts directed at awareness creation of glaucoma in Africa[8] and awareness of the disease can influence regular eye checks for early detection and prognosis of this asymptomatic disease.[17] A lot of persons in developing countries do not have regular and timely examinations and this is partly due to lack of awareness or knowledge about glaucoma.[17]

Glaucoma progresses slowly with few, if any, noticeable symptoms in the early stage. Because there are no overt symptoms or associated pain, people do not undergo screening, a requirement for early diagnosis.[8] This results in a high proportion of patients presenting in advanced stages of the disease where there is loss of sight in an eye or both eyes.[8] Moreover, people older than 60years, people with diabetes, and those with a family history of glaucoma are also at high risk of developing glaucoma.[15]

The asymptomatic nature along with the irreversible blindness glaucoma causes, makes it a public health challenge and the second cause of avoidable blindness globally. Increased awareness about glaucoma will increase the detection and thereby reduce blindness due to glaucoma. Once blindness has occurred, visual loss can't be restored. Importance of early diagnosis in glaucoma cannot be underestimated, for its effective management and prevention of blindness.[8]

This study is thus directed at undergraduates, using Ambrose Alli University (AAU), Ekpoma, Edo state as a case study. It is believed that the result of this study will be useful in raising awareness and the level of understanding of glaucoma and other causes of blindness among students of AAU; improving Governmental agencies, non-governmental organizations and health care personnel effectiveness in promoting public awareness of avoidable causes of blindness; improving health seeking behavior for regular eye checks and increase the chance of identifying undetected cases.

Materials and Methods

The study was a descriptive cross sectional study carried out in Ambrose Alli University, Ekpoma. Ekpoma is the administrative headquarters of Esan West Local Government Area, Ambrose Alli University has three campuses and twelve faculties. The campuses are: the main campus, Emaudo campus and college of medicine.

The study population consisted of both male and female undergraduate students of Ambrose Alli University, Ekpoma, Edo state, Nigeria. The study was carried out within a period of eight months, from February 2018 to September 2018. Undergraduate students of Ambrose Alli University who are 15 years and above, undergraduate students of Ambrose Alli University who have spent at least one semester in school and undergraduate students of Ambrose Alli University that are currently pursuing a full-time degree course were included in the study. Students who are unwilling to participate in the study, part-time, pre degree and post graduate students were excluded from the study.

A multi stage sampling method was used. The first stage was done using simple random sampling method and the faculties of management sciences, basic medical science, and engineering were selected from among the twelve faculties in Ambrose Alli University by balloting. In the second stage a simple random sampling was used to select one department from the faculties selected which was done by balloting. The department of

Accounting (management sciences), Nursing (basic medical science), and Electrical Engineering (faculty of engineering) were selected. The calculated minimum sample size using Leslie and Kish formula for cross sectional surveys was 232. Based on the population of the departments, the sample size allocation for the departments are as follows: Department of Accounting = 73, department of Electrical Engineering = 44 and department of Nursing = 115.

The data was collected using interviewer based questionnaire focusing on the knowledge, risk factors and preventive measures of glaucoma blindness. Distribution of questionnaire was done by the researchers who also supervised the completion and collection of questionnaire. 20 questionnaires were distributed for pretesting to 20 randomly selected individuals in Samuel Adegboyega University, Ogwa, Esan West Local Government Area.

The research was approved by the department of Community Medicine Ambrose Alli University Ekpoma. Ethical approval for the study was sought from the ethical review board Irrua Specialist Teaching Hospital. Verbal informed consent was obtained from respondents before questions were administered. The purpose of the research was explained to the respondents as best as possible and they were made to understand that information gotten will be strictly confidential and purely for academic purpose.
Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 21, manufactured by IBM Corporation and results were presented in form of numerical and diagrammatic presentations. The chi square test was also used to test for statistical associations and the level of significance was set as $p < 0.05$.

Results

A total of 232 students took part in this study. The Sociodemographic characteristics of the respondents is as shown in Table 1. The mean (standard deviation) age of respondents was 20.57(±2.98) with majority of the respondents, 121 (54.8%) belonging to the age group of 16-

Table 1: Socio-demographic characteristics of the respondents

Variable	Frequency (n=221)	Percentage(%)
Age group (years)		
16-20	121	54.8
21-25	93	42.1
26-30	7	3.2
Mean ± Standard Deviation	20.57 ± 2.988	
Gender		
Female	134	60.6
Male	87	39.4
Ethnic group		
Esan	86	38.9
Bini	59	26.7
Yoruba	17	7.2
Igbo	15	6.8
Owan	10	4.5
Etsako	9	4.1
Urhobo	7	3.2
Hausa	6	2.7
Others[*]	12	5.5
Religion		
Christianity	201	91.0
Islam	19	8.6
Atheist	1	.5
Level of study		
100	93	42.1
200	45	20.4
300	43	19.5
400	25	11.3
500	15	6.8
Department		
Basic medical sciences	106	48.0
Management sciences	71	32.1
Engineering	44	19.9

20years. There were more female respondents 134(60.6%). Two hundred and one (91%) and nineteen (8%) were Christians and Muslims respectively. The ethnicity was dominated by Esan (38.9%) followed by Bini (26.7%), 100level had more respondents (42.1%).

Knowledge of glaucoma blindness among respondents is shown in Table 2. Of the 221 respondents, 59(26.7%) knew the correct definition of glaucoma, 156(70.6%) knew that glaucoma leads to loss of vision when left untreated. Risk factors were identified of which family history was the most (31.2%) identified.

Table 2: Knowledge of glaucoma blindness

Variable	Frequency(n=221)	Percentage(%)
What is Glaucoma		
Wrong definition	162	73.3
Correct definition	59	26.7
Untreated glaucoma leads to loss of vision		
I don't know	56	25.3
No	9	4.1
Yes	156	70.6
Damage due to glaucoma is reversible		
I don't know	106	48.0
No	47	21.3
Yes	68	30.8
Glaucoma can present without symptoms		
I don't know	109	49.3
No	45	20.4
Yes	67	30.3
Blindness due to glaucoma can be prevented		
I don't know	79	35.7
No	5	2.3
Yes	137	62.0
Glaucoma treatment		
Medicines(Eye drops)	92	41.6
Surgery	78	35.3
Laser	10	4.5
Risk factors of glaucoma		
Family history	69	31.2
Increased Intraocular pressure	53	24.0
High blood pressure	18	8.1
Diabetes	16	7.2
Increasing age(Age>40years)	40	18.1
Steroid use	11	5.0
Chronic Smoking	14	6.3

The knowledge of practice of preventive measures of glaucoma is shown on Table 3. Most (88.7%) respondents agreed that eye screening/checkup can help prevent glaucoma blindness and 39.8% respondent gave a positive answer to having done an eye checkup before. Of the respondents who had an eye checkup done, 29.9% had their eyes examined in a health centre/hospital. Sixty-five (29.4%) respondents had their eyes examined by an optometrist and 24% had their eyes examined once in a while.

Table 4 shows the association between knowledge of Glaucoma and Sociodemographic data. There was no statistical significance between the level of knowledge of glaucoma and age group (in years), gender and the level of study of respondents. However, there was a statistical significance between knowledge of glaucoma and the department of respondents (p=0.048). There was also a statistical significant difference between knowledge of glaucoma and the level of study in the nursing department (p<0.001).

Table 3: Practice of preventive measures of glaucoma

Variable	Frequency	Percentage (%)
Eye screening/checkup can help prevent glaucoma blindness	n=221	
No	25	11.3
Yes	196	88.7
Done an eye checkup/examination before	n=221	
No	133	60.2
Yes	88	39.8
Where did you have your eyes checked	n=88	
Health centre/Hospital	66	75.0
Outreach programme	20	22.7
Chemist store	2	2.3
Who checked/examined your eyes	n=88	
Medical doctor	11	12.5
Optometrist	65	73.9
Medical technician	4	4.5
I can't remember	3	3.4
Nurse	5	5.7
How regular do you check your eyes	n=88	
Once in every six months	17	19.3
Once a year	8	9.1
Once in a while	53	60.2
Only when I feel a problem with my eyes	10	11.4

Table 4: Association between knowledge of glaucoma and sociodemographic data

Variable	Knowledge of glaucoma		χ^2	P - value
Age group(years)	Good(%)	Poor(%)	1.815	0.396
16-20	12(9.9)	109(90.1)		
21-25	15(16.1)	78(83.9)		
26-30	1(14.3)	6(85.7)		
Gender				
Female	15(11.2)	119(88.8)	0.670	0.413
Male	13(14.9)	74(85.1)		
Level of study				
100	6(6.5)	87(93.5)	8.969	0.062
200	7(15.6)	38(84.4)		
300	6(14.0)	37(86.0)		
400	7(28.0)	18(72.0)		
500	2(13.3)	13(86.7)		
Department				
Accounting	5(7.0)	66((93.0)	6.070	0.048*
Electrical Engineering	10(22.7)	34(77.3)		
Nursing	13(12.3)	93(87.7)		
Department and level				
Accounting				
100	2(8.3)	22(91.7)	1.87	0.980
200	1(5.9)	16(94.1)		
300	1(5.6)	17(94.4)		
400	1(8.3)	11(91.7)		
Electrical Engineering				
100	2(16.7)	10(83.3)	7.158	0.128
200	5(50.0)	5(50.0)		
300	2(28.6)	5(71.4)		
400	1(12.5)	7(87.5)		
500	0(0)	7(100)		
Nursing				
100	2(3.5)	55(96.5)	42.113	<0.001*
200	1(5.6)	17(94.4)		
300	3(16.7)	15(83.3)		
400	5(100.0)	0(0.0)		
500	2(13.3)	13(86.7)		

Table 5 shows the practice of preventive measures of glaucoma and sociodemographic characteristics.

There was no statistical significance between practice of preventive measures and age group (in years), gender and level of study of respondents.

Table 5. Association between practice of preventive measures of glaucoma and sociodemographic characterisitics.

Variable	Practice			χ^2	P- value
Age group(years	**Good(%)**	**Fair(%)**	**Poor(%)**		
16-20	37(30.6)	11(9.1)	73(60.3)	4.539	0.338
21-25	29(31.2)	8(8.6)	56(60.2)		
26-30	0(0.0)	0(0.0)	7(100%)		
Gender					
Female	35(26.1)	11(8.2)	88(65.7)	2.603	0.272
Male	31(35.6)	8(9.2)	48(55.2)		
Level of Study					
100	25(26.90	7(7.5)	61(65.6)	9.126	0.332
200	17(37.8)	2(4.4)	26(57.8)		
300	12(27.9)	5(11.6)	26(60.5)		
400	6(24.0)	5(20.0)	14(56.0)		
500	6(40.0)	0(0.0)	9(60.0)		
Department					
Accounting	22(31.0)	9(12.7)	40(56.3)	15.282	0.004[*]
Electrical Engineering	15(34.1)	8(18.2)	21(47.7)		
Nursing	29(27.4)	2(1.9)	75(70.8)		

However, there was a statistical significance between the practice of preventive measures and the departments of respondents (p= 0.004).

Discussion.

In this study, (13%) of the respondents had good knowledge of glaucoma while 87% had poor knowledge. This was similar to studies carried out in India and Ghana where level of knowledge of glaucoma was low.[18,19] Less than one-third of respondents knew the correct definition of glaucoma. About one-fifth of the respondents knew that damage due to glaucoma is irreversible and this was similar to a study done among medical students in a Federal University in Brazil.[20] There was statistical significance between level of knowledge of Glaucoma and departments of study (p=0.048). Of the three departments surveyed, Electrical Engineering department had better knowledge (22.7%) than the other two departments. There was also a statistical significance between the knowledge of glaucoma and the level of study of Nursing department (p<0.001) with those in higher classes having better knowledge with the peak occurring in 400level. There was however no statistical significance between level of knowledge of glaucoma and other sociodemographic data like age and gender.

Level of knowledge of risk factors of glaucoma among respondents was low. Six percent (6%) had good knowledge and 94% had poor knowledge. Thirty-one percent of respondents indicated family history of glaucoma as a risk factor and 24% of respondents identified increased intraocular pressure as a risk factor. This can be compared to a study done in Owo, Nigeria.[21] There was no statistical significance between knowledge of the risk factors of glaucoma and sociodemographic characteristics.

With regards to practice of preventive measures of glaucoma, 30% of respondents had good practice, 9% had fair practice and 61% had poor practice. Most of the respondents (more than

two-third) believed that regular eye screening or check-up can help prevent glaucoma. However, only a few, have ever done an eye check-up/examination (39.8%). This was similar to a previous study done in North Indian State of Haryana in 2010.[18] In those that had their eyes checked before (n=88/221), sixty-six of them had their eyes checked in the Hospital/Health Center, sixty-five of them where checked by Optometrist, eleven by Medical Doctors. Most of them only check their eyes once in a while and only when they feel a problem with their eyes with just few of them checking once in every six months and once in a year.

There was statistical significance between practice of preventive measures and department of study of respondents (P= 0.004) as the department Electrical Engineering had more percentage of good practice and less percentage of poor practice compared to other departments. However, there was no statistical significance between other sociodemographic characteristics like age and gender and this was similar to a cross sectional study done amongst final year health Science University Students in Ghana.[22]

This study also revealed that there was no statistical significance between the level of knowledge of glaucoma and the practice of preventive measures in this study. This was similar to a study done in Osun State at Obafemi Awolowo University Teaching Hospital.[11] However, there was a contrary study done amongst final year health Science University Students in Ghana where there was statistical significance between knowledge of glaucoma and practice of preventive measure and this was majorly because of the respondents of which were final year health Science Students.[22]

About two-fifth of the respondents had good practice of preventive measures of glaucoma with the rest having poor and fair practice. The study done among final year health Science Students in Ghana also revealed poor self-care practices of glaucoma among the respondents.[22]

In conclusion,. respondents' level of knowledge was poor, as only 13% of respondents had good knowledge of glaucoma blindness. Demographic variables such as age and gender did not influence level of knowledge. There was a statistical significance between level of knowledge of Glaucoma and departments of study (p=0.048). There was a statistical significance between the level of knowledge of the risk factors and the level of study of respondents (P<0.001). There was also statistical significance between practice of preventive measures and department of study of respondents (P= 0.004). Thirty percent of respondents had good practice of preventive measures. However, their practice did not influence their level of knowledge of glaucoma.

It is recommended that he Government should create public awareness of glaucoma blindness through a larger scale participation of mass media and Community Health Extension workers. There is need for Non-Governmental health organizations and healthcare personnel to conduct health seminars bothering on eye health issues as this will help to improve their knowledge on avoidable causes of blindness, particularly in school environment. They should also encourage early and regular eye check-up/examination. Eye screening tests should be incorporated in routine health evaluation of undergraduates at the start of their school year.

References

1. Resnikoff S, Pascolini D, Etya'ale D, Kocur I, Pararajasegaram R, Pokharel GP, Mariotti SP. Global data on visual impairment in the year 2002. Bull World Health Organ 2004;82:844–851.

2. Resnikoff S, Pararajasegaram R. Blindness prevention programmes: past, present, and future. Bull World Health Organ 2001;79:222–226

3. World Health Organisation. International statistical classification of diseases, injuries

and causes of death, tenth revision. Geneva, 1993.

4. Quigley HA, Broman AT. The number of people with glaucoma worldwide in 2010 and 2020. Br J Ophthalmol. 2006; 90:262–267.

5. Kanski JJ. Glaucoma. Clinical Ophthalmology: A systematic Approach. 6th ed. Oxford: Elsevier Butterworth-Heinemann; 2007. p. 372-376.

6. Foster A, Resnikoff S. The impact of Vision 2020 on global blindness. Eye. 2005; 19:1133–1135

7. Keeffe JE, Keeffe JE. Utilisation of eye care services by urban and rural Australians. Br J Ophthalmol. 2002; 86:24–27.

8. Egbert PR. Glaucoma in West Africa: a neglected problem. Br J Ophthalmol. 2002; 86:131–132.

9. Tenkir A, Solomon B, Deribew A. Glaucoma awareness among people attending ophthalmic outreach services in Southwestern Ethiopia. BMC Ophthalmol. 2010; 10:17.

10. Nwosu SNN. Patients' knowledge of glaucoma and treatment options. Nig J Clin Pract 2010; 13; 74-77.

11. Adegbehingbe BO, Bisiriyu LA. Knowledge, attitudes, and self care practices associated with glaucoma among hospital workers in Ile-Ife, Osun State, Nigeria. Tanzan J Health Res. 2008; 10:240–245.

12. Saw SM, Gazzard G, Friedman D, Foster PJ, Devereux JG, Wong ML, et al. Awareness of glaucoma and health beliefs of patients suffering primary acute angle closure. Br J Ophthalmol. 2003; 87:446–449

13. Thylefors B, Negrel AD. The global impact of glaucoma. Bull WHO 1994; 72: 323-326.

14. Cook C, Foster P. Epidemiology of glaucoma: what's new? Can J Ophthalmol. 2012; 47:223–226.

15. Quigley HA. Glaucoma. Lancet. 2011; 16:1367-1377.

16. Bodunde OT, Daniel OJ, Onabolu OO. Knowledge, attitude and health believes of glaucoma patients in a Nigerian hospital. Niger Med Pract. 2006; 50:62–64.

17. Leite MT, Sakata LM, Medeiros FA. Managing glaucoma in developing countries. Arq Bras Oftalmol. 2011; 74:83–84

18. Reweri P, Kakkar M. Awareness, knowledge, and practice: A survey of glaucoma in north Indian rural residents' Indian J Ophthalmol. 2014; 62: 482–486.

19. Kobia-Acquah E, Essien E, Ablordeppey R, Donkor R, Ankamah-Lomotey S et al. Attitudes and Beliefs of Undergraduate Students to spectacle wear in Ghana. Adv Opthalmol Vis syst 2018; 8: 00264. D01:10.15406/aovs. 2018.00264

20. Martins SC, Marcos Mendes MH, Guedes RAP, Guedes VMP, Chaoubah A. Knowledge about primary open angle glaucoma among medical students. 2014. Rev Bras Ofiamol 2014;73; 302-307.

21. Komolafe OO, Omolase CO, Bekibele CO, Ogunleye OA, Komolafe OA, Omotayo FO. Awareness and Knowledge of Glaucoma among Workers in a Nigerian Tertiary Health Care Institution Middle East Afr J Ophthalmol. 2013; 20: 163–167.

22. Boadi-Kusi SB, Kyei S, Mashige KP, Hansraj R, Abraham CH, Ocansey S, Agbedzie EL. Awareness, knowledge and self-care practices toward glaucoma among final year health science university students in Ghana. Clin Exp Optom. 2015;98:160–167.