

EYE CARE UTILIZATION IN AN ACADEMIC COMMUNITY IN NIGERIA: PATTERN, PREDICTORS AND CHALLENGES

Dr. Nkiru N. Kizor-Akaraiwe^{1,2,5*}, Dr. Ngozi Oguego³, Dr. Obinna Shiweobi^{4,5}, Dr. Nkechi Uche^{3,5}, Dr. Edak Ezeanosike^{4,5}, Dr. Chinyelu N. Ezisi^{4,5}, Dr. Obiajulu Echedom⁵, Dr. Cosmas Anajekwu^{1,2}, Dr. Chukwu Oko^{2,5}, Dr. Alphonsus Okoh⁵

¹Department of Ophthalmology, Enugu State University of Science and Technology College of Medicine, Enugu, Nigeria.

²Enugu State University of Science and Technology Teaching Hospital Parklane, Enugu, Nigeria.

³Department of Ophthalmology, University of Nigeria Teaching Hospital Ituku Ozalla, Enugu.

⁴Department of Ophthalmology, Alex Ekwueme Federal University Teaching Hospital Abakaliki Ebonyi State.

⁵The Eye Specialists Hospital, Enugu, Enugu State, Nigeria.

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*Corresponding Author: Dr. Nkiru N. Kizor-Akaraiwe

Department of Ophthalmology, Enugu State University of Science and Technology College of Medicine, Enugu, Nigeria.

ABSTRACT

Purpose: To determine the pattern of utilization of eye care services as well as identify the determinants and challenges associated with utilization of eye care services amongst staff members of a Nigerian University.

Methods: A cross sectional survey of consecutive staff of the University of Nigeria, Nsukka, Nigeria who took part in a 10-day free eye screening held in 2017. A self-administered questionnaire was used to collect data from consenting participants on demographics, attitude and practice towards eye care services as well as reasons for non-utilization of eyecare. Primary outcome variables were practice of eye checks in a lifetime and within the preceding one year while secondary outcome variables were predictors and challenges associated with doing eye checks. Regression analysis was carried out to identify possible predictors of having eye checks. **Results:** 955 staff members were included in the study. Mean age was 46.37 ± 9.9 years (range 20-79 years). Female participants were slightly higher in number than the male 487(51.0%). Of all participants, 538(56.3%) had done an eye check in their lifetime, of which 35.9% were done beyond 5 years prior to the free screening. Sex (OR:1.76, 95% CI:1.22-2.55, P=0.003), highest educational qualification (OR:1.29, 95% CI:1.2-1.64, p=0.034) and visual acuity in the better eye (OR:1.54, 95% CI:1.14-2.07, p=0.005) were significant predictors of an eye check within the preceding one year and in one's lifetime. Age and a positive attitude towards eye check were additional predictors for the latter. Cost was the leading challenge for non-utilization of eye checks (31.4%). Other reasons were absence of eye symptoms (22.7%), busy schedules (21.6%), non-availability of a good eye care center in the town (18.4%) and no perceived need for eye checks (5.9%). **Conclusions:** The utilization of eyecare in this university community is not optimal with only about half the study participants having done an eye check in their lifetime. Subsidizing cost, providing eye care services within the university environment and improving eye health education, may improve utilization of eye care among this study population.

KEYWORDS: Eye check, utilization, University, Nigeria, Eye care.

INTRODUCTION

The World Health Organization estimates visual impairment affects about 2.2 billion people worldwide with more than 50% being preventable or awaiting treatment.^[1] In the African region, it is estimated that 26.3 million people have a form of visual impairment, of which 5.9 million are blind.^[1] In most developing

countries, the prevalence of visual impairment is about 3.8% to 16.8%^[2,3,4] In Nigeria, prevalence of blindness and severe visual impairment in persons 40 years and above was 4.2% and 1.5% respectively with a total prevalence of visual impairment of 14% based on best corrected vision in the better eye.^[2] Older age is usually associated with increasing prevalence of all major

blinding conditions with females having a higher risk of visual impairment than males.^[2,7] Uncorrected refractive errors are the commonest cause of mild and moderate visual impairment, while cataract is the leading cause of blindness and severe visual impairment.^[5,6,7,8] Glaucoma, age-related macular degeneration are other important causes of visual impairment.

Due to the increased risk of visual impairment with age, routine eye examination is recommended for adults 40 years and above every 1-4 years depending on varied risk factors for ocular pathology.^[9,10,11] Routine eye examinations are opportune times for early diagnosis of sight threatening conditions especially in asymptomatic, silently blinding conditions such as glaucoma, age related macular degeneration, refractive error, diabetic retinopathy. Early detection of any ocular pathology followed up with appropriate and adequate treatment significantly reduces avoidable visual loss.^[12,13] Asymptomatic adults and those without risk factors for eye disease are advised to receive a baseline comprehensive eye evaluation at age 40.^[10,11] However, in environments with higher risk factors for certain ocular pathologies such as glaucoma in the black African race, where glaucoma has an earlier onset, routine eye checks are encouraged at an earlier age.^[14,15] Individuals without risk factors aged 40 to 54 years, are advised to have eye checks every 2 to 4 years, and 1 to 3 years for those aged 55 to 64 years. All these are apart from school eye health programme which is encouraged to start from age 5 at a frequency of 1-2 years.^[16,17] Frequency of eye examinations in the presence of acute or chronic disease varies from hours to several months, depending on the number of risk factors, response to treatment and potential for the disease progression.^[10]

Utilization of eye care services including routine eye checks have been reported to be low despite availability of eye care services. Eye care utilization has been studied among medical doctors (59.9%), commercial drivers (20.4%), hearing impaired students (43.9%), persons with diabetes (21.7%), persons diagnosed with glaucoma (35.5%), staff of a tertiary hospital (11.8%), among rural and urban dwellers.^[18,19,20,21,22,23,24,25] Population studies have shown better utilization of eye care services in the developed climes (48%-82%) compared to the developing world (19%-38%) where health care services may not be evenly distributed.^[23,24,26,27,28] The Education sector, an important sector of any economy, responsible for transfer of formal knowledge and building intellectual capacity, requires good visual function for her activities. However, literature is scarce on utilization of eye care services among staff in this sector.

The aim of this study was to determine the pattern of utilization of eye care services as well as identify the determinants and challenges associated with utilization of eye care services amongst staff members of the University of Nigeria, Nsukka. The findings may provide

important evidence for advocacy for the provision of primary eye care services within the university campus.

METHODOLOGY

The study was a cross sectional survey of consecutive staff of the University of Nigeria, Nsukka (UNN), Nigeria who took part in a 10-day free eye screening held in May 2017 at the University premises. University of Nigeria, is the foremost indigenous university in the country, with over 3,000 staff members at its Nsukka campus. However, it is located in a semi-urban town without a resident or visiting eyecare provider within the university medical facility. Following approval from the Management of the university, the public relations department took charge of the dissemination of information to the different academic/non-academic staff, departments, faculties and schools/colleges. Invitation letters were sent to all staff through emails, to all departments and faculties and also pasted on the official notice boards. Information contained in the letters included importance of eye screening, details of the free eye screening program, the dates and venue. Three or four faculties were merged for screening on a particular day depending on size of the faculties. A central screening point was chosen as venue close to these faculties. Screening was offered free of cost to all participants. Those who could not participate on the appointed day for their faculties were encouraged to join another faculty during the screening exercise.

During the screening, patients' demographics, awareness of glaucoma, level of knowledge about glaucoma as well as attitude and practice towards uptake of eye care services were recorded in a self-administered questionnaire (Part A), while ocular findings were entered by the ophthalmologist who examined them. (Part B). The questionnaires were further reviewed by a research assistant to ensure completeness and confirm accuracy of information provided. Non-academic staff who could not read properly had their questionnaire administered by an interviewer. Clinical assessment included visual acuity (Snellen's chart), intraocular pressure measurement (Non-Contact Tonometry-NCT Huvitz HNT 7000); anterior and posterior segments examinations with the pen torch light and direct ophthalmoscope respectively. Refraction was done by Optometrists when visual acuity was 6/9 or less who had refractive errors with the use of retinoscope.

For the purpose of the survey and ease of analysis, patients' visual impairments were grouped into four classes (mild, moderate, severe, blindness) based on the WHO classification of visual impairments.^[1] Presenting visual acuity was regarded as the visual acuity without any aid. The categories covered visual acuity levels as: Normal (6/5-6/9), Mild visual impairment (6/12 - 6/18), Moderate visual impairment (6/24 - 6/60), Severe visual impairment (6/60-3/60), Blindness (<3/60 -NPL). Patients with visual acuities worse than 6/60 were further evaluated to determine cause. Diagnosed cases were

treated and or referred. Individuals with eyes in apparent good health were encouraged to have another eye check the following year.

For the purpose of this study, practice of eye check was regarded as uptake of eye care services while awareness of practice of eye check was regarded as being clearly aware of the necessity of eye check. Socio-demographics were analysed alongside practice of eye check to identify predictors, while reasons given for not having eye checks were noted as challenges. Primary outcome variables were practice of eye check at least once and within the preceding one year while secondary outcome variables were predictors and challenges associated with doing routine eye checks.

Data were entered and analyzed using IBM Statistical Package for Social Sciences (SPSS) version 22. Means

and standard deviations were calculated for quantitative variables while frequencies and percentages were calculated for qualitative variables. Regression analysis was carried out to identify possible predictors of having eye checks. All p-values reported are two-tailed and significance was defined as $p < 0.05$.

RESULTS

One thousand and eighty-three persons participated in the 10-day free eye screening exercise, of which 955 were members of staff of the university, constituting a 31.8% staff response rate. Mean age of study population was 46.37 ± 9.9 years (range 20-79 years). Female participants were slightly higher in number than the male participants 487(51.0%).

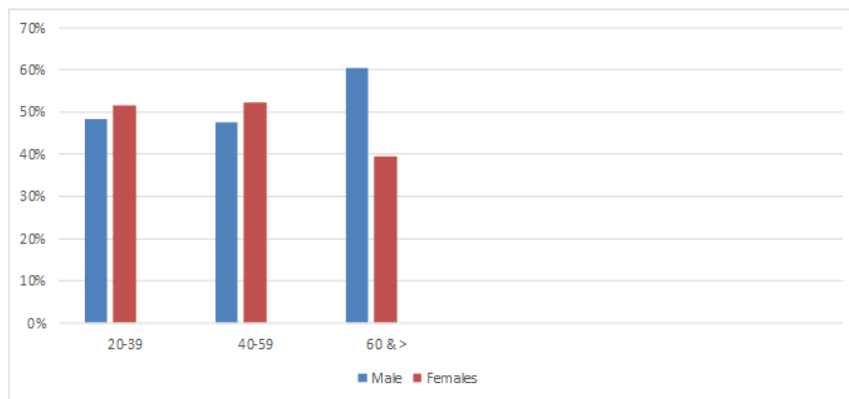


Figure 1: Age and Sex distribution of study participants.

All participants had at least primary education and 79.1% of them had tertiary education and higher degrees. More non-academic staff members presented for the free eye screening exercise 671(70.3%) whereas only 284(29.7%) academic staff participated. (Table 1) One hundred and seventy-four 174(18.2%) of the study population reported previous diagnosis of hypertension, 42(4.4%) gave a history of diabetes mellitus while 100(10.5%) had a family history of glaucoma.

The proportion of visual impairment in the better eye of participants decreased with the severity of visual impairment with 795(83.2%) having normal vision, 115(12.0%) mild visual impairment, 40(4.2%) moderate visual impairments, 4(0.4%) severe visual impairment and only one participant was blind. (Table 1) Two-third of the participants 655(68.6%) were diagnosed with an eye condition that required treatment or correction.

Table 1: Socio- Demographics and Clinical characteristics of study participants.

Participant characteristics	Frequency	Percentage (%)
Age		
20-39	227	23.8
40-59	637	66.7
60-79	91	9.5
Sex		
Male	468	49.0
Female	497	51.0
Marital status		
Single	136	14.3
Married	743	77.8
Divorced	6	0.6
Separated	70	7.3
Highest level of Education		

Primary	75	7.9
Secondary	125	13.1
Tertiary	330	34.5
Higher	425	44.5
Cadre		
Academic	284	29.7
Non-academic	671	70.3
Hypertensive		
No	643	67.3
Yes	174	18.2
Not sure	138	14.5
Diabetic		
No	786	82.3
Yes	42	4.4
Not Sure	127	13.3
Family history of glaucoma		
No	540	56.5
Yes	100	10.5
Not sure	315	33.0
Visual acuity in better eye		
Normal	795	83.2
Mild	115	12.1
Moderate	40	4.2
Severe	4	0.4
Blind	1	0.1

Eight hundred and eighty-eight participants (92.9%) affirmed the need for regular eye checks at intervals whereas 67(7.1%) did not see the need or not sure of the need for eye checks. Among 888 who affirmed the need

for regular eye checks, 515(58.0%) had done an eye check whereas among the 67participants who saw no need or were not sure of the need, 23(34.3%) had done an eye check p=0.001.

Table 2: Relationship between having an eye Check and Being aware of the need for an check.

		Had an eye check			P-value
		Never	Yes	Total	
Perceived Need for eye Check	No	8(66.7%)	4(33.3%)	12(100%)	0.001
	Yes	373(42.0%)	515(58.0)	888(100%)	
	Not sure	36(65.5%)	19(34.5%)	55(100%)	
		417	538		

Of the nine hundred and fifty-five participants, 538(56.3%) had an eye check at least once in their lifetime at varied intervals before the present screening. Of these 538 participants, 146(27.1%) had their eye

check within the preceding one year, 145(26.9%) within the past 2-3years, 54(10.0%) within the past 4-5years and 193(35.9%) beyond 5years.

Table 3: Eye care check pattern across Socio-clinical demographics.

	Eye care Utilization intervals					Total (%)
	Never (%)	Within 1year (%)	2-3years (%)	4-5years (%)	>5years (%)	
	417(43.7)	146(15.3)	145(15.2)	54(5.7)	193(20.2)	955(100)
Characteristics						
Age groups						
20-39	127(55.9)	30(13.2)	21(9.3)	9(4.0)	40(17.6)	227(100)
40-59	260(40.8)	100(15.7)	105(16.5)	39(6.1)	133(20.9)	637(100)
60-79	30(33.0)	16(17.6)	19(20.9)	6(6.6)	20(22.0)	91(100)
Sex						
Male	248(53.0)	54(11.5)	63(13.5)	24(5.1)	79(16.9)	468(100)
Female	169(34.7)	92(18.9)	82(16.8)	30(6.2)	114(23.4)	487(100)

Education						
Primary	42(56.0)	6(8.0)	7(9.3)	4(5.3)	16(21.3)	75(100)
Secondary	86(68.8)	10(8.0)	5(4.0)	1(0.8)	23(18.4)	125(100)
Tertiary	132(40.0)	59(17.9)	53(16.1)	18(5.5)	68(20.6)	330(100)
Higher	157(36.9)	71(16.7)	80(18.8)	31(7.3)	86(20.2)	425(100)
Staff Cadre						
Academic	94(33.1)	54(19.0)	55(19.4)	24(8.5)	57(20.1)	284(100)
Non-academic	323(48.1)	92(13.7)	90(13.4)	30(4.5)	136(20.3)	671(100)
Hypertensive						
No	300(46.7)	90(14.0)	99(15.4)	31(4.8)	123(19.1)	643(100)
Yes	38(21.8)	41(23.6)	39(22.4)	14(8.0)	42(24.1)	174(100)
Not sure	79(57.2)	15(10.9)	7(5.1)	9(6.5)	28(20.3)	138(100)
Diabetes						
No	334(43.8)	120(15.3)	122(15.5)	46(5.9)	154(19.6)	786(100)
Yes	11(26.2)	7(16.7)	12(28.6)	1(2.4)	11(26.2)	42(100)
Not sure	62(48.8)	19(15.0)	11(8.7)	7(5.5)	28(22.0)	127(100)
Diagnosed of an eye condition						
No	134(44.7)	45(15.0)	47(15.7)	15(5.0)	59(19.7)	300(100)
Yes	283(43.2)	101(15.4)	98(15.0)	39(6.0)	134(20.5)	655(100)
Visual acuity in better eye						
Normal	377(47.4)	113(14.2)	116(14.6)	40(5.0)	149(18.7)	795(100)
Mild	34(29.6)	19(16.5)	22(19.1)	10(8.7)	30(26.1)	115(100)
Moderate	6(15.0)	13(32.5)	6(15.0)	4(10.0)	11(27.5)	40(100)
Severe	0(0)	1(25.0)	1(25.0)	0(0.0)	2(50.0)	4(100)
Blindness	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(100.0)	1(100)

Of all factors, older age (OR-1.66, CI-1.28-2.16, P=0.000), Sex (OR-2.23, CI-1.69-0.2.94, P=0.000), highest level of education (OR-1.53 CI -1.29-1.82 p=0000), having a positive attitude towards eye check

and visual acuity in better eye were statistically significant predictors of having an eye check in one’s lifetime. (Table 3)

Table 3: Predictors of having an eye check in one’s lifetime.

Variables	Odd ratio	95% CI	P-value
Age	1.66	1.28-2.16	0.000
Sex	2.23	1.69-2.94	0.000
Education	1.53	1.29-1.82	0.000
Staff cadre	0.85	0.72-1.01	0.61
Hypertensive status	1.02	0.83-1.26	0.82
Diabetic status	0.97	0.78-1.21	0.78
Positive attitude towards eye checks	0.53	0.30-0.91	0.02
Visual acuity in better eye	2.55	1.83-3.55	0.000
Having an eye condition	1.01	0.75-1.36	0.973

On the other hand, only sex (OR:1.76, 95%CI-1.22-2.55, P=0.003, highest educational qualification (OR:1.29, 95%CI:1.2-1.64,P=0.034) and visual acuity in the better

eye (OR:1.54, 95%CI:1.14-2.07, p=0.005) were statistically significant predictors of having an eye check within the past one year.

Table 4: Predictors of having an eye check within the last one year.

Variables	Odd ratio	95% CI	P-value
Age	1.13	0.81-1.59	0.46
Sex	1.76	1.22-2.55	0.003
Education	1.29	1.02-1.64	0.034
Staff cadre	0.92	0.75-1.14	0.448
Hypertensive status	1.05	0.80-1.38	0.702
Diabetic status	1.00	0.76-1.34	0.966
Positive attitude towards eye checks	0.53	0.24-1.17	0.115

Visual acuity in better eye	1.54	1.14-2.07	0.005
Having an eye condition	1.02	0.69-1.51	0.930

Reasons for not utilizing eye care services

Among the 440 participants who did not have previous eye checks done, cost was the leading challenge reported in 138(31.4%), followed by absence of any eye

symptoms in 100(22.7%), busy schedules 95(21.6%), non-availability of a good eye care center in the town 81(18.4%) and 26(5.9%) who felt there was no need for eye checks.

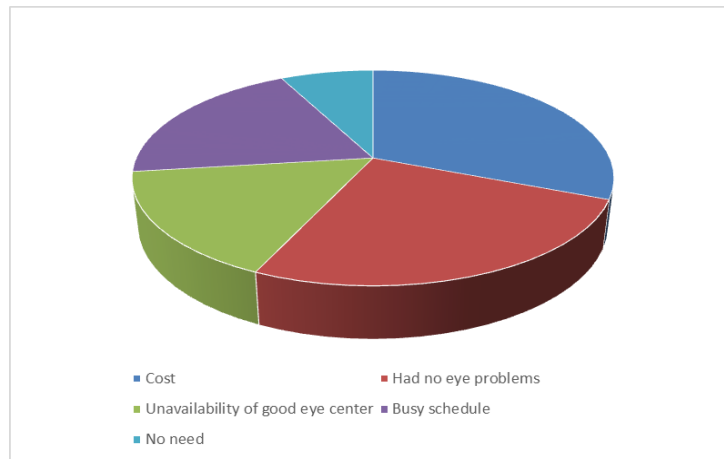


Figure 2: Reasons for not doing eye checks.

DISCUSSION

This study examined the pattern, predictors, and challenges of eye checks among staff of a tertiary academic institution in Southeastern Nigeria. In this enlightened population, 92.9% affirmed the necessity of a regular eye check, however, only 56.3% of them had done an eye examination once in their lifetime. Age, sex, highest level of education, a positive attitude towards eye check and visual acuity in the better eye were significant predictors of having an eye check in their lifetime, whereas only sex, highest educational qualification and visual acuity in the better eye were the identified predictors within the preceding year. Financial constraint was the major challenge (31.4%) to having eye checks. Other reasons included absence of eye problems, unavailability of a good eye care in the area, busy schedules, and the perception that there was no need for eye checks.

This study showed a higher prevalence of having an eye check at least once (56.3%) compared to other studies among urban and rural population groups in this area that ranged from 19-38%.^[19,22,23,29] However, the prevalence is close to the 59.9% found among medical doctors in southeast, Nigeria.^[18] In contrast also, Emamiam et al found 83.68% lifetime utilization of eye care in a population study in Iran. This is likely due to the higher age range of their study participants (40-64years) compared with that of our study group(20-69years).^[30] Older age is a positive determinant for utilization of eye care and was an important predictor of utilization of eye care services at least once among this study participants. This is consistent with the findings of other studies in developing and developed climes.^[23,24,29,30,31,32] Older age is usually associated with increased risk of developing

eye diseases and other chronic diseases.^[33,34,35] Hypertension and diabetes are common diseases associated with age and are important risk factors for the development of glaucoma, diabetic eye diseases, age-related macular degeneration, and poor vision due to uncertain causes. About one-fifth of the study participants had a self-reported diagnosis of either hypertension or diabetes. Likewise, age is an important risk factor in cataract, refractive error, and presbyopia (which usually starts at 40years). Any of these may have resulted in an initial visit to eye care facilities as a person grew older. This is one of the reasons for recommending a routine baseline eye examination at 40years.^[10]

Being educated has been found to have positive impact on health awareness and health seeking behaviour. Different studies noted increased health care utilization with higher education.^[23,29,36,37] This may account for the difference observed in this study when compared with other less educated study populations in the country. More than two-third of this study population had at least a tertiary education. Their educational status is closer to that of medical doctors, likewise the utilization. A more educated population needs clear vision especially for near work and would most likely seek eyecare for presbyopic correction with age. However, continued utilization was not sustained as more than a third of those who utilized eye care did so, more than five years earlier.

At all intervals, females were found to utilize eye care services better than the males. This is similar to other studies on eye care utilization, where the female gender was identified as an important determinant of eye care utilization.^[32,36,37] However, some studies noted to the contrary.^[23,29] For example, among a rural population in

western Nigeria,^[23] males were found to have previously utilized eye care more. Sex was also not a general determinant in the study by Akuffo et al but on stratification, females with self-reported vision problems and females in highest wealth quintile were more likely to have an eye exam than the males.^[38] Females are generally considered less empowered financially than the males thereby limiting access and uptake of health services, but the females in this study are salary earners who are comparatively more likely to afford their health care services. Females are also considered generally more sensitive to changes in their body and seek health care at the slightest discomfort whereas the males may postpone seeking health care especially if it would adversely limit their financial and physical functioning.^[39]

This study identified visual acuity in the better eye to be a predictor of eye care utilization. Individuals are likely to seek help when they observe significant changes in sight. About 80% of the study participant had normal vision in their better eyes and utilization of eye care services increased as vision in better eyes worsened. A similar study in the study area also noted a change in vision as an incentive for eye care utilization.^[30] Several studies across the globe affirm the presence of visual impairment or reported eye problems as important determinants in eyecare utilization.^[23,38] However a study in Iraq identified visual impairment association with negative history of eye examination due to poverty.^[30] The eyes are important organs for this study population for the purpose of reading, writing, researching and carrying out administrative duties. Any decline in sight may affect the individual's ability to function at work. The guidelines for school eye health programme for children^[16,17] recommend screening of teachers alongside the children. For teachers of all ages, it recommends habitual distance visual acuity testing at the 6/9 level and if they fail in one or both eyes, refraction should be undertaken in the school or referred to an eye care facility. For teachers aged 40 years and more, it recommends a near visual acuity measurement to assess whether they can read N5 at 40 cm with current near correction or unaided. If they cannot, a near add should be prescribed. Though staff categories were not significant predictors for eye care utilization, more of the academic staff had their eyes examined before this screening compared to the non-academic staff.

Positive attitudes towards eye check result more in practice of eye checks. As found in this study, 58% of the eight hundred and eighty-eight participants who felt there was a need for regular eye check have had an eye check at least once, whereas only 33% of those who saw no need for routine eye check had done an eye exam. A study among adults in rural area in western Nigeria among persons who needed eye care revealed that up to 44.2% of participants had a perception that their eye problem was not important.^[40] Awareness of the benefits

of eye checks will likely improve the practice than otherwise.

In this enlightened community, barriers to utilization of eye care services exist as is applicable to the general population, with cost being the major reason (31.4%) for non-utilization of eye care. This academic institution, located in the semi urban area of the state, had limited availability of eye care services in the town but none within the university community. Cost of eye care therefore included cost of transport to the urban area, apart from the cost of medical consultations and treatments. Several studies have identified cost of care as a barrier to healthcare including eye care even among those who had the need for eye care.^[40,41] Individuals with health insurance are found to utilize eye care more.^[29] Absence of a good eye care center around, which is a contributory factor to cost, was identified by this study as one of the main reasons (18.4%) for non-utilization of eye care. Individuals usually travel long distances to access good eye care service. This is a common challenge with eye care utilization especially in developing countries where resources for eye care are not optimally distributed.^[23,41] The establishment of an eye clinic in the university environment and equipping it with the relevant materials and manpower may likely encourage utilization among this study group.

The second most common reason identified to hinder utilization of eye care among this study group is having no eye problems. Most of the persons in this study group (80.0%) had normal vision. Most of these may not have had any eye complains or symptoms therefore saw no need for an eye examination. Unfortunately, there are some blinding diseases such as glaucoma and diabetic retinopathy which only give symptoms late in the disease process. In such diseases, regular eye checks often provide the platform for early detection. Another group of study participants also stated their reason for not having an eye check as not seeing the need. These two groups of persons are closely related as they see no need for an eye check when they have no eye complaints. A number of studies have also noted this as a factor responsible for poor utilization of eye care.^[40,42,43]

About a fifth of those who failed to utilize eye care services responded that they had busy schedules and that has been the reason for not having an eye examination earlier. According to this group, their busy schedules denied them sufficient time to go seek eye care. It is plausible to assume utilization of eye care services might improve when it is brought closer to them.

Limitation of the study

Response rate to the screening was low. Similarly, sampling was not random as only consecutive staff who presented for the screening were interviewed from which data for the study were harnessed.

CONCLUSION

About half this study population had done an eye exam once in their lifetime. Gender, age, educational level, visual acuity in the better eye and a positive attitude towards eye checks were identified as significant predictors of eye care utilization. Cost, no prior knowledge of the need for eye check and unavailability of eye care centers were challenges to eye care utilization. Subsidizing cost of eye care, making eye care services available within the university environment and improving education on the need for routine eye check, may improve utilization of eye care among this study population.

REFERENCES

- World Health Organisation. Blindness and visual impairment. <https://www.int/news-room/factsheets/detail/blindness-and-visual-impairment>, 2022; 13.
- Kyari F, Gudlavalleti MVS, Sivsubramaniam S, Gilbert CE, Abdull MM, Entekume G, et al. Prevalence of blindness and visual impairment in Nigeria: the National Blindness and Visual Impairment Study. *Invest Ophthalmol Vis Sci*, 2009; 50: 2033–9.
- Kovini N, Gichuhi S, Basanez M, Flaxman SR, Jonas JB, Keffe J et al. Prevalence and causes of vision loss in sub-saharan Africa, 1990-2010. *BJO* 2014; 98(5): 612-618.
- Assefa NL, Admas AW, Adimasu NF. Prevalence and associated factors of visual impairment among adults in Debre Berhan town, North Shewa, Ethiopia. *BMC Ophthalmol*, 2020; 20: 316.
- Pascolini D, Mariotti SP. Global estimates of visual impairment: 2010. *Br J Ophthalmol*, 2012; 96(5): 614–618. <https://doi.org/10.1136/bjophthalmol-2011-300539>
- Bourne RRA, Stevens GA, White RA, et al. Causes of vision loss worldwide, 1990–2010: A systematic analysis. *Lancet Glob Heal*, 2013; 1(6): 339–349.
- Resnikoff S, Pascolini D, Etya'ale D, et al. Global data on visual impairment in the year 2002. *Bull World Health Organ*, 2004; 82(11): 844–551.
- Abdull MM, Sivasubramaniam S, Murthy GVS, Gilbert C, Abubakar T, Ezelum C, et al. Causes of Blindness and Visual Impairment in Nigeria: The Nigeria National Blindness and Visual Impairment Survey. *Investig Ophthalmology Vis Sci*, 2009; 50: 4114.
- Feder RS, Olsen TW, Prum BE, Summers CG, Olson RJ, Williams RD, et al. Comprehensive Adult Medical Eye Evaluation. *Ophthalmology*, 2016; 123: P209–36.
- Frequency of Ocular Examinations - 2015 - American Academy of Ophthalmology [Internet]. [cited 2017 Nov 10]; Available from: <https://www.aao.org/clinical-statement/frequency-of-ocular-examinations>
- Health Quality Ontario HQ. Routine eye examinations for persons 20-64 years of age: an evidence-based analysis. *Ont Health Technol Assess Ser*, 2006; 6: 1–81.
- Sandra L, Hui H, Marvin Z. Importance of early detection of diseases and scheduling of screening examinations. *Statistical methods in medical research*, 2005; 13(6): 443-56.
- Brooks BR. Earlier is better: the benefits of early diagnosis. *Neurology*, 1999; 53(8): 153-157.
- Ntim-Amponsah CT, Amoaku WMK, Ofosu-Amaah S, Ewusi RK, Idirisuriya-Khair R, Nyatepe-Coo E, et al. Prevalence of glaucoma in an African population. *Eye*, 2004; 18: 491–7.
- Verrey JD, Foster A, Wormald R, Akuamoah C. Chronic glaucoma in Northern Ghana—A retrospective study of 397 patients. *Eye*, 1990; 4: 115–20.
- Gilbert C, Minto H, Morjaria P, Khan I. Standard school eye health guidelines for low and middle income countries. *International Agency for prevention of Blindness*, 2018; 95.
- Khan I, Gilbert C, Morjaria P. Guidelines for school-based eye health programs. *School Health Integrated Programming*, 2020; 37. [https://www.sightsavers.org/wp-content/uploads/20/01/SHIP_vision screening and technical guidelines](https://www.sightsavers.org/wp-content/uploads/20/01/SHIP_vision_screening_and_technical_guidelines)
- Onwuegbunam A, Apakama A, Amobi M, Chiankwalam E. Practice of eye checks among medical doctors in south east Nigeria. *Advances in Research*, 2021; 22(4): 39-46.
- Egboka N, Bolarinwa O, Awoyeni A, Patrick C. Eye care practices among commercial drivers in a developing country. *Research Journal of health Sciences*, 2017; 5(2): 82.
- Majekodunmi O.I, Olusanya BA, Oluleye TS. Utilization of Eye care services among students attending schools for the hearing impaired in Oyo State, South West Nigeria. *Ann Ib Postgrad Med*, 2019; 17(2): 181-186.
- Akrofi B. Utilization of Eye Care Services Among Patients With Diabetes Attending The Endocrine Clinic of Korle Bu Teaching Hospital. <http://ugspace.ug.edu.gh/handle/123456789/32924>
- Ajite KO, Fedamiro OC, Ajayi IA, Omotoye OJ. Utilization of eye care among staff of a tertiary hospital. *Asia Pacific Journal of Ophthalmology*, 2013; 2(1): 28-31.
- Olusanya BA, Ashaye AO, Owoaje ET, Baiyeroju AM, Ajayi BG. Determinants of Utilization of Eye Care Services in a Rural Adult Population of a Developing Country. *Middle East Afr J Ophthalmol*, 2016; 23: 96–103.
- Keeffe JE, Weih LM, McCarty CA, Taylor HR. Utilisation of eye care services by urban and rural Australians. *Br J Ophthalmol*, 2002; 86: 24–7.
- Robin A, Nirmalan PK, Krishnadas R, Ramakrishnan R, Katz J, Teilsch J, Thulasiraj RD, Friedman DS. The utilization of eye care services by persons with glaucoma in rural south India. *Trans Am Ophthalmol Soc*, 2004; 102: 47-56.

26. Foreman J, Xie J, Keel S, Taylor H, Dirani M. Utilization of eye health care services in Australia: The National Eye health Survey. *Clin Exp Ophthalmol*, 2018; 46(3): 213-221.
27. Chou C, Barker LE, Crews JE, Primo SA, Zhang X, Elliott AF, Bullard K, Geiss LS, Saaddine JB. Disparities in Eye care utilization among the United States adults with visual impairment: Findings from the behavioural risk factor surveillance system. *Am Journal of Ophthal*, 2012; 154(6): 45-52.
28. Fotouhi A, Hashemi H, Mohammad K. Eye care utilization patterns in Tehran population: A population based cross-sectional study. *BMC Ophthalmol*, 2006; 6: 4.
29. Ibeneme HO, Ekpenyong BN, Ebri A. Barriers to accessing eyecare services in the federal capital territory Abuja, Nigeria. *Br J Ophthalmol*, 2012; (5): 614-618.
30. Emamian M.H, Zeraati H, Majdzadeh R, Shariati M, Hashemi H, Fotouhi A. Economic inequality in eye care utilization and its determinants: A Blinder-Oaxaca Decomposition. *Intl Journal of health policy and management*, 2014; 3(6): 307-313.
31. Arinze O.C, Eze B.I, Chuka Okosa CM. Determinants of eye care utilization in rural south east Nigeria. *Journal of community health*, 2015; 40: 881-890.
32. Bylsma GW, Le A, Mukesh BN, Taylor HR, McCarty CA. Utilization of eye care services by Victorians likely to benefit from eye care. *Clin Experiment Ophthalmol*, 2004; 32: 573-7.
33. Gohdes DM, Balarugan A, Larsen BA, Maylahn C. Age related eye diseases: an emerging challenge for health professionals. *Prev Chronic Dis*, 2005; 2(3): A17.
34. Nicoli T, Partridge L. Ageing a risk factor for disease. *Current Biology*, 2012; 22(17): R741-R752.
35. Allen JO. Ageism as a risk factor for chronic disease. *The Gerontologist*, 2016; 56(4): 610-614.
36. Vela C, Samson E, Zunzunegui MV, Haddad S, Aubin MJ, Freeman EE. Eye care utilization by older adults in low, middle and high income countries. *BMC Ophthalmol*, 2012; 12: 5.
37. Jin YP, Trope GE. Eye care utilization in Canada: Disparity in the publicly funded health care system. *Can J Ophthalmol*, 2011; 46: 133-8.
38. Akuffo K.O, Sewpaul R, Dukhi N, Asare A.K, Kumah D.B, Addo E.K, Agyei-Manu E, Reddy P. Eye care utilization pattern in South Africa: results from SANHANES-1. *BMC Health services research*, 2020; 20: 756
39. Stefan EK. Gender differences in health information behaviour: a finnish population based survey. *Health promotion international*, 2015; 30(3): 736-45.
40. Olusanya B.A. Reasons for non-utilization of eye care services among adults in a rural west African population. *Afr J Medicine and medical sciences*, 2018; 47(1).
41. Elam AR, Lee PP. Barriers and suggestions on improving eye care in High risk individuals: Focus group results. Open access, 2014.
42. Ibeneme HO, Ekpenyong BN, Ebri A. Barriers to accessing eyecare services in the federal capital territory Abuja, Nigeria. *Br J Ophthalmol*, 2012; (5): 614-618.
43. Ebeigbe JA. Factors influencing eye care seeking behaviour of parents for their children. *Clinical and Experimental Optometry*, 2016; 101(4): 560-564.