Pattern of refractive error among staff of a tertiary health facility in Northwest Nigeria

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ABSTRACT

Background: Globally, uncorrected refractive error is a major cause of blindness, visual impairment and low vision. Healthcare providers require optimal vision to function effectively; therefore, it is essential to determine their refractive state and provide appropriate intervention when necessary.

Aim: To determine the refractive status and pattern of refractive error among staff of a tertiary health facility.

Methods: A descriptive cross-sectional study conducted among staff of the Federal Teaching Hospital Birnin Kebbi between May and June 2018. Clinical and sociodemographic data, including level of education, tribe, department/ unit, refractive state, and usage of corrective spectacles, were collected using a questionnaire designed for the study. Visual acuity was assessed using a Snellen chart; those with visual acuity less than 6/6 were further assessed using a pinhole. Streak retinoscopy at a working distance of two-thirds of a meter was performed in the eye clinic for those with features of refractive error. The data was analyzed using IBM SPSS version 21.

Results: A total of 507 staff were examined; 113 (22.3%) had refractive error, 105 (20.7%) had presbyopia, and 289 (57.0%) did not have any refractive error. There were 347 (68.5%) males and 160 (31.5%) females. Seventy-one subjects (14.0%) had myopia, 24 (4.7%) had hypermetropia, while 18 (3.6%) had astigmatism. The commonest presbyopic correction was +1.00D.

Conclusion: Refractive error is fairly common among the staff of this health facility. Health care workers are advised to regularly check their eyes and obtain refractive correction, if necessary, for optimal vision and effective function.

Keywords: prevalence of refractive errors; hyperopia; myopia; adult refractive state; Nigerian public health.

INTRODUCTION

Globally, uncorrected refractive error (RE) is a major cause of blindness, visual impairment and low vision. It is the second leading cause of avoidable/treatable blindness, and it is estimated that 153 million people are either blind or have low vision from uncorrected RE. The three main types of refractive errors, myopia, hypermetropia, and astigmatism, present with blurring of vision for far, near, or both, and other complaints depending on the type of RE the individual has.[1-14]

The global burden in terms of annual economic loss is reported to be very high, and uncorrected RE is of public health importance.[1] If left untreated, RE can result in low productivity and impaired quality of life. Healthcare providers require optimal vision to function effectively; thus, there is a need to know their refractive state and provide appropriate intervention where required. Prescription of appropriate corrective lenses is the treatment of choice, which, in the form of spectacles, is one of the most cost-effective interventions in eye health. There is paucity of data on the pattern of RE, especially among healthcare providers in Nigeria. To the best of our knowledge, no study has been conducted

on the pattern of RE among health facility staff in our facility in the past. The aim of this study was to determine the pattern of Refractive Error and to determine the type of presbyopic correction among the respondents.

METHODS

This was a descriptive cross-sectional study conducted among the staff of Federal Medical Centre Birnin Kebbi, between May and June 2018. Approval from the Ethics and Research Committee of the institution and consent from individual respondents were obtained. Data on the biodata, level of education, tribe, department/unit, refractive state, and usage of corrective spectacles were collected with the use of a questionnaire designed for the study. Questions were asked about past ocular examination. Distance visual acuity was assessed using a Snellen chart placed at 6 meters, for the right eye first, while the left eye was covered and then, vice versa. Eyes with visual acuity less than 6/6 were further assessed using a pinhole to check for improvement in visual acuity. Near vision was assessed using a near vision chart.Streak retinoscopy at a working distance of two-thirds of a meter was performed in the eye clinic for those with features of refractive error. Those with corrective spectacles were also refracted, and their current refraction results compared with their spectacles; where a significant difference between the two was observed, they were advised to obtain new spectacles based on the current refraction prescription.

For this study, refractive error was defined as unaided visual acuity of less than 6/6, with significant (more than two lines) improvement using a pinhole. Myopia was defined as any RE of −0.5DS and above. Hyperopia was defined as any RE of +0.50DS and above. Astigmatism was defined as any RE which required a cylindrical correction of −0.5DC and above. Presbyopia was defined as unaided near vision worse than N4 at a reading distance of 30cm. All staff on duty in all the departments /units during the study period in the hospital were included in the study. Staff with cataract, glaucoma, or corneal disease were excluded from the study. Data was analysed using the IBM SPSS version 21. Descriptive statistics, including frequencies and means, were generated, and further analysis was done.

RESULTS

A total of 507 respondents were examined, and the age of the participants ranged from 20 to 60 years. The mean age was 39.40 ± 4.21 years. There were 347 (68.5%) males and 160 (31.5%) females, with a male-to-female ratio of 2.2:1. Table 1 shows the age and sex distribution of the respondents.

Table 1: Age and sex distribution of respondents

Age (in years)	Sex		
	Male	Female	Total (%)
20 – 29	41(8.1)	16(3.2)	57(11.2)
30 – 39	154(30.4)	92(18.1)	246(48.5)
40 – 49	139(27.4)	49(9.7)	188(37.1)
50 – 59	12(2.4)	3(0.5)	15(3.0)
≥ 60	1(0.2)	0(0)	1(0.2)
Total	347(68.5)	160(31.5)	507(100)

A significant proportion of staff, 371 (73.2%), had visual acuity of 6/6 in their right eyes (Table 2). A total of 113 (22.3%) respondents had refractive error, 105(20.7%) had presbyopia, and 289 (57.0%) did not have any refractive error. Only 16 (3.2%) staff were found to have visual acuity of less than 6/24 (Table 2) in the better eye. Out of the 105 (20.7%) respondents with presbyopia, 40 (38.1%) had near vision of N6 without correction binocularly, 15 (14.3%) had near vision of N8 without correction binocularly, while only 1 (1.0%) respondent had near vision of N12 without correction binocularly. A total of 150 (29.6%) respondents had spectacle correction already (88 participants for distance only, and 62 were using bifocal lenses). More than 60% of respondents had never had any eye examination (Table 2).

The frequency of uncorrected refractive error was as follows: myopia- 71(14.0%), hyperopia- 24(4.7%) and astigmatism- 18 (3.6%) (Table 3). The commonest presbyopic correction was +1.00D (Table 4).

Table 2: Unaided visual acuity distribution of the participants

VA	Right eye (%)	Left eye (%)
6/6	371(73.2)	360(71.0)
6/9	84(16.6)	96(18.9)
6/12	19(3.7)	19(3.7)
6/18	19(3.7)	16(3.2)
6/24	6(1.2)	8(5.6)
6/36	6(1.2)	6(1.2)
6/60	2(0.4)	2(0.4)
Total	507(100)	507(100)

Near vision	N4	N5	N6	N8	N9	N10	N12
Frequency	402	31	40	15	13	5	1

Past history of eye examination	YES (%)	NO(%)	TOTAL
	170(33.5%)	337(66.5)	507 (100)

VA – visual acuity

Table 3: Refractive status of the participants by age

Age	E(%)	M(%)	H(%)	A(%)	P(%)	TOTAL(%)
20 - 29	44(8.7)	6(1.2)	4(0.8)	3(0.6)	0(0)	57(11.2)
30 - 39	172(33.9)	35(6.9)	16(3.1)	8(1.6)	15(3.0)	246(48.5)
40 - 49	73(15.4)	27(5.3)	2(0.4)	5(1.0)	69(13.6)	176(34.7)
50 - 59	0(0)	3(0.6)	2(0.4)	2(0.4)	16(3.2)	23(4.5)
$\geq$ 60	0(0)	0(0)	0(0)	0(0)	5(1.0)	5(1.0)
TOTAL	**289(58.0)**	**71(14.0)**	**24(4.7)**	**18(3.6)**	**105(20.7)**	**507(100)**

E- emmetropia, M-myopia, H-hyperopia, A-astigmatism, P-presbyopia

Table 4: Presbyopic correction of the respondents

NV	N4	+1.0DS	+1.50DS	+1.75DS	+2.00DS	+2.50DS	+3.00DS	+3.50DS	TOTAL
N4	402	0	0	0	0	0	0	0	402
N5	0	17	14	0	0	0	0	0	31
N6	0	14	12	13	1	0	0	0	40
N8	0	0	1	5	5	4	0	0	15
N9	0	0	0	4	3	3	3	0	13
N10	0	0	0	0	2	3	0	0	5
N12	0	0	0	0	0	0	0	1	1
TOTAL	**402**	**31**	**27**	**22**	**11**	**10**	**3**	**1**	**507**

NV- Near vision

DISCUSSION

The study showed that more males were examined than females. This is probably due to the sociocultural nature of the study environment, where more males are engaged in government employment. This observation is similar to reports from past studies.[3-7]

Participants' ages ranged from 20 to 60 years, age of 60 years being the retirement age of civil servants in Nigeria. This was an anticipated finding as most civil servants in developing countries are expected to remain in government jobs till age 60.

Less than 50% of the respondents actually knew their refractive state or had ever checked their eyes. This shows poor eye health practices despite having an eye department in the hospital.

More than 50% of the study population did not have any refractive error. Myopia was the most common type of RE in this study; this observation is similar to the report from a study done in Osogbo[14] in Nigeria and those reported by other authors.[3-13] Although many of these studies[3-13] were prevalence studies.

In a study from Ghana[16] and a rural south Indian population study[17], hyperopia was recorded as the highest prevalent refractive error, followed by myopia and astigmatism.

Hyperopia was observed to be more common in the 30-39 years age group, contrary to the study in India[17] that reported the highest frequency of hyperopia in the 51-55 years age group.

Almost one-third of the respondents already had corrective spectacles. This observation compared well with other previous studies [2,6,8,9] in Nigeria; however, our study was not a prevalence study like those reports.

CONCLUSION

Refractive error is not uncommon among healthcare staff; myopia accounts for the majority of cases. Staff are advised to regularly check their eyes and get their refractive error treated for optimal vision and effective function.

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