

Prevalence and Causes of Visual Impairment among Adults in Jos North Local Government Area of Plateau State

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Abstract

The objective of the study was to determine the prevalence and causes of visual impairment among adults in Jos North Local Government Area (LGA) of Plateau State, Nigeria. This was a rapid assessment of avoidable blindness (RAAB) study in which a multistaged sampling technique was used to select a total of 22 clusters. Households were selected by the compact segment technique, which were visited door by door until 39 persons aged 50 years and above are identified and recruited for the study. Examination and diagnosis was made based on the RAAB protocol to determine the major cause of visual impairment. The prevalence of visual impairment and blindness was 18.8% [confidence interval (CI) = 16.2–21.4%] and 5.6% (CI = 4.2–7.0%), respectively. The wards with the highest prevalence of visual impairment are Rigiza (45%), Gangare (35%), and Ibrahim Katsina ward (35%). About 96.8% causes of visual impairments and 95% causes of blindness were avoidable with cataract [78 (48.8%)], glaucoma [26 (16.3%)], uncorrected refractive error [25 (15.6%)], cataract surgical complications [17 (10.6%)], and couching [5 (3.1%)] being the most common causes of visual impairment and cataract [18 (37.5%)], glaucoma [16 (33.3%)], and couching [5 (10.4%)] being the most common causes of blindness. The prevalence of visual impairment was found to be 18.8% in Jos North Local Government Council, and this varies among the wards with Rigiza, Gangare, and Ibrahim Katsina having the highest prevalence. Most of the causes were avoidable. There is a need to reorganize the existing eye-care program and also integrate eye-care services into the existing health-care services that are not rendering eye-care services in the LGA so as to reduce the burden of blindness and visual impairment.

Keywords: Blindness, causes, Jos North, plateau, prevalence, visual impairment

Key Messages: The prevalence of visual impairment was found to be high in Jos North Local Government Council and this varies among the wards and most of the causes of visual impairment were avoidable.

INTRODUCTION

Visual impairment negatively impacts every aspect of the life of an individual and it is currently defined as the presenting visual acuity (VA) of less than 6/18 in the better eye in the International Classification of Diseases version 10.^[1] It includes low vision defined as presenting VA of less than 6/18 to 3/60 in the better eye or corresponding visual field loss of less than 20° of fixation in the better eye and blindness, which is defined as presenting VA of less than 3/60 in the better eye, or corresponding visual field loss of less than 10° from fixation in the better eye.^[2] The World Health Organization (WHO) estimated in 2015 globally that there were 285 million visually impaired persons, 39 million blind, and 246 million people having low vision.^[3] About 90% of the world's blind or visually impaired live in low-income settings, whereas 82% of people living with blindness are

aged 50 years and above.^[3] Global causes of visual impairment are uncorrected refractive errors (43%), cataract (33%), glaucoma (2%), age-related macular degeneration (ARMD), diabetic retinopathy, trachoma, and corneal opacities, each about 1%, and 18% of causes are undetermined.^[3] To the best of the authors' knowledge, no published study has been carried out on the prevalence and causes of visual impairment among adults aged 50 years and

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above in Jos North Local Government Area (LGA) of Plateau State. The study is to close this gap in knowledge on the prevalence and causes of visual impairment in the study area.

METHODOLOGY

Study area

This study was carried out in Jos North LGA of Plateau State from November 26, 2016 to May 27, 2017. The state is located in the North Central geopolitical zone of Nigeria and has an estimated population of about 3.5 million by the 2006 census. Approximately 15% of the population are 50 years of age or older. Jos North LGA is one of the 17 LGAs of the state and has an area of 285 km² with a projected population of 545,000 by the 2006 census.

Jos North LGA is bordered in the North by Bauchi state, in the West by Bassa LGA, in the East by Jos East LGA, and in the South by Jos South LGA. It is made up of 22 wards which include: Abba Nashehu, Ahwol, Ali Kazaure, Anguwan Rogo/Rimi, Gangare, Garba Daho, Ibrahim Katsina, Jenta Adamu, Jenta Apata, Jos Jarawa, Kabong, Lamingo, Naraguta ward B, Nassarawa A, Nassarawa B, Mazah, Sarkin Arab, Targon, Rigiza, Tafawa Balewa, Tudun Wada, and Vandapuye.

There are 1470 health-care centers in the state (government and private centers). These are made up of 1095 government-owned centers of which 1068 are primary health centers, 24 secondary centers, and 3 tertiary centers. There are 375 privately owned health facilities, comprising 306 centers offering primary health services, 37 private secondary centers, and 2 private tertiary centers.^[4]

Comprehensive eye-care services including cataract surgical services are provided by nine hospitals comprising one federal government-owned tertiary center, a state-owned specialist hospital, three missionary hospitals, and four private hospitals. Only one center (a mission hospital) is located outside the state capital, Jos. The federal tertiary center and two missionary hospitals have satellite offices and services that allow referral of patients to the base hospitals for surgery. Surgical eye camps are organized periodically. The distance of the federal tertiary center to the study area is 12 km, whereas that of the state-owned specialist hospital and the missionary hospitals is between 1 and 3 km.

Sample size

The minimum sample size for a simple random sampling calculated with the rapid assessment of avoidable blindness (RAAB, International Centre for Eye Health, London School of Hygiene & Tropical Medicine, United Kingdom)^[5] software version 5 package was 613 using the following parameters:

- (1) Population of persons 50 years or more in Jos North LGA estimated at 15% of the population of Jos North LGA (i.e., 15% of 545,000 was 81,750).^[6]

- (2) Likely prevalence of moderate visual impairment among persons aged 40 years or more of 10.04% (0.1004).^[7]
- (3) Precision or degree of accuracy of 20% (0.2)
- (4) Noncompliance of 10% (0.1)
- (5) Confidence interval (CI) of 95%

However, cluster random sampling technique was used for the study, thus the minimum sample size was calculated by multiplying the sample size above (for simple random sampling) with a design effect of 1.4 and a value of 858 was obtained.

Sample technique

This was a multistage cluster sampling technique as follows:

Stage 1: Selection of clusters

This was carried out by obtaining the sampling frame which refers to the lists of all the wards with their population as follows:

- (1) The map of Jos North LGA was obtained from the LGA headquarters.
- (2) The list of all the settlements (wards) in the survey area with their population was obtained from independent national electoral commission (plateau state branch) and entered into spreadsheet on Microsoft excel.
- (3) The first column contained the names of all the wards arranged by their geographical location.
- (4) The second column contained the population of each ward.
- (5) Cluster size of 39 persons was determined by dividing the sample size of 858 by number of clusters which is 22 as obtained by the RAAB software.^[5]

Stage 2: Selection of households

This was performed using compact segment technique, in which each ward was segmented to allow 39 persons 50 years and above to be examined.

- (1) Number of segments = Population of adults 50 years and above in a ward/Cluster size

For Rigiza,

Number of segments in Rigiza = $1750/39 = 44.9$, approximately 45 segments

For Gangare,

Number of segments in Gangare = Population of adults 50 years and above in Gangare/Cluster size

= $3932/39 = 100.8$, approximately 101 segments

The same method was used to determine the number of segments for the remaining 20 clusters [Table 1].

Each segment was then assigned a number on a piece of paper which was folded and dropped into a ballot box. A segment was randomly selected after shaking the ballot box.

Table 1: Ward population and number of segments

S. no.	Ward	Population of ward	Population of adults 50 years and above	Number of segments
1	Rigiza	11,672	1750	45
2	Gangare	26,219	3932	101
3	Ibrahim Katsina	25,179	3777	97
4	Anguwan Rogo/Rimi	24,803	3720	95
5	Sarkin Arab	14,606	2190	56
6	Tudun Wada	53,251	7988	205
7	Mazah	20,551	3082	79
8	Nassarawa A	16,624	2494	64
9	Ali Kazaure	38,210	5731	147
10	Lamingo	20,819	3123	80
11	Garba Daho	27,527	4129	106
12	Jos Jarawa	18,421	2763	71
13	Naraguta ward B	34,662	5199	133
14	Jenta Adamu	24,961	3744	96
15	Ahwol	21,255	3188	82
16	Nassarawa B	14,500	2175	56
17	Targon	11,000	1650	42
18	Abba Nashehu	34,613	5191	133
19	Vandapuye	9978	1497	38
20	Kabong	49,655	7448	191
21	Jenta Apata	35,267	5290	136
22	Tafawa Balewa	11,227	1684	43

Stage 3: Selection of eligible persons

All the households in the selected segment were visited door to door until 39 people aged 50 years and above are identified and recruited for the study. For segment with fewer than 39 persons aged 50 years and above, a second segment was randomly selected until 39 persons aged 50 years and above were recruited.

Sampling procedure

A multistage cluster random sampling technique was used with 22 clusters of 39 persons per cluster. Households were selected using a compact segment technique where each ward was segmented to allow 39 persons 50 years and above to be examined. All the households in the selected segment were visited door to door until 39 people aged 50 years and above were identified and recruited for the study. A standard protocol for RAAB^[5] was used for all the eligible subjects. Data collected included general demographic information, VA, and ocular examination. VA at a distance of 6 m in daylight was assessed by an ophthalmic nurse using an un-illuminated Snellen chart for literate participants and an E chart for nonliterate participants. Those with VA of 6/18 and better had anterior segment examination and funduscopy and were discharged. Subjects with VA less than 6/18 were reassessed to determine the major cause of blindness/visual impairment, where their best-corrected VA was determined by optometrist (for those that the vision improved with pin hole). Those with VA worse than 6/18, whose VA did not improve with pin hole and refraction, and who do not have

obvious anterior segment morbidity had a repeat posterior segment examination after full mydriasis (with one drop of 5% phenylephrine and 1% tropicamide each unless contraindicated). Those who developed intolerable photophobia from mydriasis were given sunshades.

The principal cause of visual loss for each eye and for the individual was determined. The major cause of visual loss in an eye with more than one disorder was the treatable or preventable disorder.

Inclusion criteria

The study participants were adults aged 50 years and above residing in selected clusters of Jos North LGA of Plateau State who consented to the study.

Exclusion criteria

- (1) All subjects who did not consent to the study.
- (2) All participants who were not available at home during data collection.
- (3) All subjects less than 50 years of age.

Data management

Data obtained was transferred to Microsoft excel validated by double entry and analyzed using the Statistical Package for Social Sciences (SPSS) Version 20 (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY, United States: IBM Corp). Frequencies, percentages, and median were generated to observe the

pattern of variable distribution among the participants. Bivariate analysis was conducted using cross-tabulations. The prevalence of visual impairment was expressed as a proportion. Chi-square (χ^2) test was used to test the significance of the association between categorical variables. Where the expected frequency of a cell was <5 , Fisher exact test was used. A *P*-value of <0.05 was considered statistically significant with 95% CI also calculated

Definitions of terms by the WHO RAAB methodology

- (1) No visual impairment-presenting VA of 6/18 or better.
- (2) Visual impairment-presenting VA of worse than 6/18 in the better eye.
- (3) Severe visual impairment-presenting VA of $<6/60$ to $3/60$ in the better eye.
- (4) Low vision-presenting VA of less than 6/18 to $3/60$ in the better eye.
- (5) Blindness-presenting VA of less than $3/60$ in the better eye.
- (6) Presenting VA: The VA of the participant on assessment (this include unaided VA for participants not using spectacles and VA with spectacles for individuals who have corrective spectacles on while being assessed).
- (7) Cataract is defined as the opacification of the lens fibers.
- (8) Refractive error is defined as presenting VA of worse than 6/18 which improves with pin hole.
- (9) Glaucoma is diagnosed by a vertical cup–disk ratio of 0.8 or greater or a cup–disc asymmetry of 0.2 or greater.
- (10) Age-related macula degeneration is defined clinically by the presence of drusens at the macula, retinal pigment epithelial changes (hyper or hypopigmentation), geographic atrophy, and/or choroidal neovascularization.
- (11) Diabetic retinopathy is defined by the presence of the following in the retina; microaneurysm, hemorrhages (dot and blot and/or splinter), hard exudates, cotton wool spots, venous changes, arterial changes, and/or neovascularization.
- (12) Trachoma is defined clinically as the presence central corneal scarring in the presence of at least one of the

following signs of trachoma: trichiasis/entropion, conjunctival scarring, pannus, or Herbert pits.

- (13) Phthisis bulbi is defined as small shrunken globe due to trauma or severe infection.
- (14) Onchocerciasis is defined by sclerosing keratitis, pear-shaped dilatation of the pupil, optic atrophy, and/or chorioretinal atrophy predominantly involving the posterior fundus.
- (15) Surgical complications refer to an eye that was blind or visually impaired that had undergone cataract surgery in the absence of other causes of blindness/visual impairment.
- (16) Household was defined as all those living under the same roof and eating from a common cooking pot routinely.

Ethical Considerations

Ethical approval was obtained for from the Medical Research Ethic Committee of the Jos University Teaching Hospital. An informed consent was also obtained from the local government chairman and ward heads where clusters are located. The nature, aims, and objectives of the study were explained to the participants and those who consent to the study gave consent for the study.

RESULT

Participant's characteristics

A total of 858 participants who met the inclusion criteria were enumerated for the study. Seven of them declined participation giving a response rate of 99.2%. Of the 851 study participants, 482 (56.6%) were males and 369 (43.4%) were females. A higher proportion 423 (49.7%) of participants was aged 50 to 59 years [Table 2]. Figure 1 shows the gender distribution of study participants.

The data on the literacy level indicated that the predominant participants had no formal education [447 (52.5%)] and primary education [198 (23.3%)].

Prevalence of visual impairment

Up to 691 (81.2%) participants had a presenting VA of 6/18 or better, 160 (18.8%, 95% CI=16.2–21.4%) had visual impairment (VA $< 6/18$) and 48 (5.6%, 95% CI=4.2–7.0) persons were blind [Table 3].

Table 2: Age-specific prevalence of visual impairment

Age group (years)	Total <i>n</i> (%)	No impairment <i>n</i> (%)	Visually impaired <i>n</i> (%)	Prevalence (%)	95% CI (%)
50–59	423 (49.7)	403 (58.3)	20 (12.5)	4.7	2.7–6.7
60–69	203 (23.9)	163 (23.6)	40 (25.0)	19.7	14.3–25.3
70–79	126 (14.8)	83 (12.0)	43 (26.9)	34.1	25.8–42.4
≥80	99 (11.6)	42 (6.1)	57 (35.6)	57.6	41.8–73.9
Total	851 (100)	691 (100)	160 (100)		

*CI, confidence interval; *P* < 0.001 (Fisher exact derived).

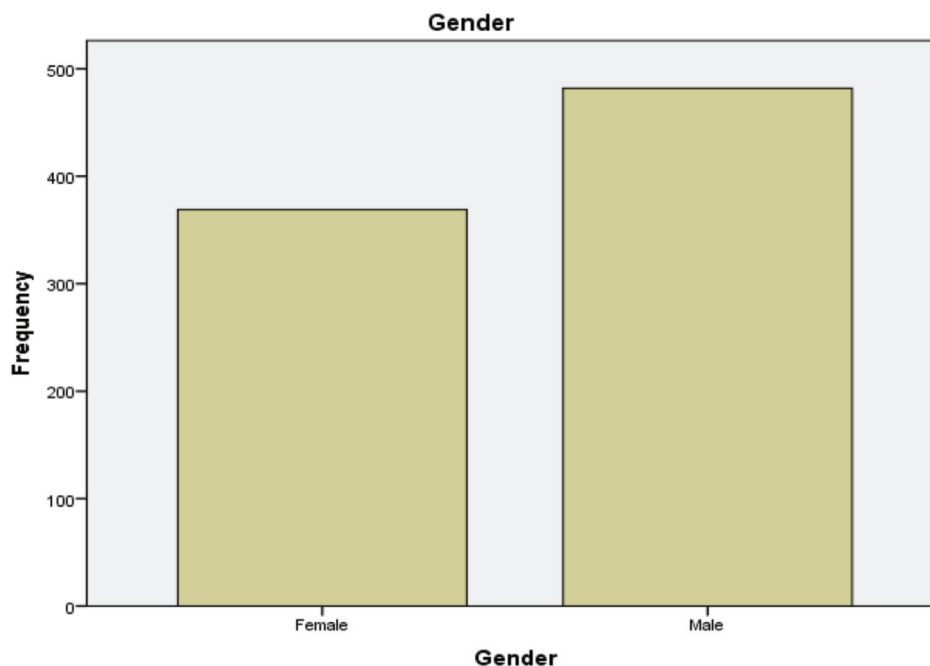


Figure 1: Gender distribution of study participants.

Table 3: Visual impairment among study participants without and with correction

Category of VI	Without correction		With correction	
	Freq.	Percent (95% CI)	Freq.	Percent (95% CI)
No VI	691	81.2 (79.9–82.5)	716	84.2 (81.8–86.7)
Moderate VI	100	11.8 (9.6–14.00)	75	8.8 (6.9–10.7)
Severe VI	12	1.4 (0.6–2.2)	12	1.4 (0.6–2.2)
Blindness	48	5.6 (4.2–7.0)	48	5.6 (4.2–7.0)
Total	851	100	851	100

*VI, visual impairment; CI, confidence interval; Prevalence of visual impairment using presenting visual acuity: 160 (18.8%, 95% CI: 16.2–21.4). Prevalence of visual impairment using best corrected visual acuity: 135 (15.8%, 95% CI: 13.4–18.4).

After the best correction, a total of 135 (15.9%) participants had visual impairment, whereas 716 (84.2%) had no visual impairment [Table 3]. Of those who had visual impairment, 75 (8.8%) persons had moderate visual impairment, 12 (1.4%) persons had severe visual impairment, and 48 (5.6%) remained blind [Table 3]. The median age of the 160 (18.8%) participants who had visual impairment was 71 years. In addition, most persons with visual impairment [103 (64.4%)] were aged 50 to 79 years. There was a statistically significant increase in the prevalence of visual impairment with increasing age rising from 4.7% in the age group 50 to 59 years to 57.6% among those aged ≥ 80 years [χ^2 (Fisher exact) = 201.1, $P < 0.001$; Table 2].

Of the 160 persons with visual impairment, 104 (65.0%) were males and 56 (35.0%) were females, with a male to female ratio of 1.9:1. Of the males with visual impairment, 59 (56.7%) had moderate visual impairment, 8 (7.7%) had severe visual impairment, and 37 (35.6%) had blindness, whereas of the females with visual impairment 41 (73.2%)

had moderate visual impairment, 4 (7.1%) had severe visual impairment, and 11 (19.7%) had blindness.

The majority of the participants with visual impairment had no formal education [127 (79.4%)], whereas 22 (13.8%) had primary education, 9 (5.6%) had secondary education, and only 2 (1.3%) had tertiary education. There was a statistically significant association between literacy level and visual impairment [χ^2 (Fisher exact test) = 111.4, $P = 0.01$].

The prevalence of blindness was found to increase with age: 7 (1.7%) persons in the age group 50 to 59 years were blind, whereas 15 (15.2%) persons ≥ 80 years of age were blind [χ^2 (Fisher exact) = 37.3, $P < 0.001$; Table 4].

The ward with the highest proportion of visual impairment was Rigiza (46.2%), this was closely followed by Gangare and Ibrahim Katsina wards (36% each) and then Anguwan Rogo/Anguwan Rimi ward (30.1%) [Table 5]. However, Tudun Wada ward had the highest magnitude (2077) of visual impairment, whereas the Tafawa Balewa ward had the lowest magnitude (50) of visual impairment [Table 5].

Causes of visual impairment (persons)

Among the 160 persons with visual impairment, the common causes of visual impairment were untreated cataract [78 (48.8%)], glaucoma [26 (16.3%)], uncorrected refractive error [25 (15.6%)], surgical complications [17 (10.6%)], and couching [5 (3.1%)] Table 6. About 96.8% of visual impairments were avoidable. The common causes of blindness were cataract (37.5%), glaucoma (33.3%), and couching (10.4%). Other causes of blindness, severe visual impairment, and visual impairment are summarized in Table 6.

DISCUSSION

The high response rate attained in this study allows for generalization of the results to the local government as a

whole. The current study is the first survey on the prevalence of visual impairment in Jos North LGA of Plateau State. In this study, visual impairment and blindness were observed to be a significant problem in the community as revealed by the high prevalence and magnitude. Visual impairment is considered to be a public health problem when it interferes with ordinary life as a disability, adversely affects the quality of life, increases susceptibility to injuries or accidents, negatively impacts productivity and national progress dramatically increases economic and social costs and burdens the health-care system.^[8] This high prevalence and magnitude could be attributed to the lack of a well-organized eye-care program in this LGA and the state at large. A population-based study among adults aged 50 years and above in Plateau State put the prevalence at 4.2% for blindness and 15.8% for visual impairment which is similar to the prevalence of visual impairment of 15.9% and that of blindness of 5.6% obtained from this study with best correction.^[9] A similar study in North West Nigeria of adults 40 years and above revealed prevalence of 8.2% and 15.1% for blindness and refractive error, respectively.^[10] The higher prevalence of blindness (8.2%) could be because the study was carried out in a remote, underserved rural area, where eye-care services are not available, inaccessible, and also unaffordable to the majority of the population. Onakpoya *et al.* had observed in a similar population-based cross-sectional study in Southwest Nigeria that the prevalence of visual

Table 4: Distribution of prevalence of blindness with age

Age group (years)	Total n (%)	Blindness n (%)	Prevalence (%)	95% CI
50–59	423 (49.7)	7 (14.6)	1.7	0.5–2.9
60–69	203 (23.9)	16 (33.3)	7.8	4.1–11.5
70–79	126 (14.8)	10 (20.8)	7.9	3.2–12.6
≥80	99 (11.6)	15 (31.2)	15.2	8.0–22.4
Total	851 (100.0)	48 (100.0)		

*CI, confidence interval; P=0.001 (Fisher exact derived).

Table 5: Ward-specific distribution of prevalence and magnitude of visual impairment

S. no.	Ward	No. of persons ≥50 years	No. of personsexamined	No. of visuallyimpaired	Freq. (%)	Magnitude (persons)
1	Rigiza	1750	39	18	46.2	809
2	Gangare	3932	39	14	36	1416
3	Ibrahim Katsina	3777	39	14	36	1360
4	Anguwan Rogo/Rimi	3720	39	12	31	1153
5	Sarkin Arab	2190	39	10	26	569
6	Tudun Wada	7988	39	10	26	2077
7	Mazah	3082	39	9	23.1	712
8	Nassarawa ward A	2494	39	8	21	524
9	Ali Kazaure	5731	39	7	18	1032
10	Lamingo	3123	39	7	18	563
11	Garba Daho	4129	39	7	18	743
12	Jos Jarawa	2763	39	6	15.4	426
13	Naraguta B	5199	39	6	15.4	801
14	Jenta Adamu	3744	39	6	15.4	577
15	Ahwol	3188	39	5	13	414
16	Nassarawa ward B	2175	39	5	13	283
17	Targon	1650	39	3	8	132
18	Abba Nashehu	5191	39	4	10.3	535
20	Vandapuye	1497	39	2	5.1	76
21	Kabong	7448	39	3	8	596
21	Jenta Apata	5290	39	3	8	423
22	Tafawa Balewa	1684	39	1	3	50

*Magnitude = Prevalence (%) × Number of persons 50 years and above.

Table 6: Causes of visual impairments

Causes	Visual impairment	Moderate visual impairment	Severe visual impairment	Blindness
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Untreated cataract	78 (48.8)	53 (53)	7 (58.3)	18 (37.5)
Glaucoma	26 (16.3)	8 (8)	2 (16.7)	16 (33.3)
Uncorrected refractive error	25 (15.6)	25 (25)	0	0
Surgical complications	17 (10.6)	11 (11)	2 (16.7)	4 (8.3)
Couching	5 (3.1)	0	0	5 (10.4)
Other corneal opacity	3 (1.8)	0	0	3 (6.3)
Optic atrophy	2 (1.3)	2 (2)	0	0
Phthisis bulbi	2 (1.3)	0	0	2 (4.2)
Retinitis pigmentosa	1 (0.6)	1 (1)	0	0
Trachoma	1 (0.6)	0	1 (8.3)	0
Total	160 (100)	100 (100)	12 (100)	48 (100)

impairment and blindness was 6.3% and 1.1%, respectively.^[11] Another population-based study in Ogun State, Nigeria, put the prevalence of visual impairment and blindness at 2.09% and 1.22%, respectively.^[12] The lower prevalence could be due to the readily available health services in most parts of Southern Nigeria as presumed by WHO.^[13] A higher prevalence of visual impairment (39.0%) and blindness (6.4%) was found in Imo State, Nigeria, and this could be because the study was largely carried out in a rural setting where eye-care services are not available and inaccessible.^[14] A similar prevalence of blindness (5.5%) was obtained from the Nigerian National Blindness and Visual Impairment Survey among participants 50 years and above.^[7] A lower prevalence of blindness was found in some Asian countries such as Pakistan (3.4%), Bangladesh (3.9%), and India (2.3%).^[15-17] This lower prevalence could be due to differences in life expectancy (which is 77 years), causes of blindness, and access to eye-care services. The prevalence of blindness in this survey is much lower than the WHO estimate for sub-Saharan Africa of 9% among adults aged 50 years and above.^[18] The prevalence of blindness is, however, high compared to that reported in similar age group in Cape Town (1.4%).^[19] Rwanda (1.0%),^[20] Kenya (1.6%),^[21] and Malawi (1.3%),^[22] the lower prevalence reported could be due to the presence of organized affordable and accessible eye-care services in these countries.

There was a statistically significant ($P < 0.001$) increase in the prevalence of visual impairment and blindness with age and this is consistent with the findings of similar population-based studies.^[7,9,12,22,23] Therefore, age serves as a risk factor for visual impairment. The observed prevalence of visual impairment and blindness in this study was highest in persons aged 80 years and above which is similar to many previous studies.^[7,9,11,12] In the present study, the prevalence of visual impairment and blindness was higher in males than females which is consistent with data from a similar study in Malawi.^[22] The reason for the male preponderance of visual impairment and blindness could be attributed to the fact that many more women either went to the market or the farm

during data collection. The prevalence of visual impairment and blindness was found to be higher among participants who had no formal education which are consistent with the findings (76.0%) of the Nigerian National Blindness and Visual Impairment Survey.^[7] In this study, there is variation in the prevalence and magnitude of blindness among the wards. Rigiza had the highest prevalence, whereas Tudun Wada had the highest magnitude. This is likely due to the fact that the population of adults 50 years and above is higher in Tudun Wada compared to that in Rigiza and this translates to the high number of visually impaired adults. In this study, the most common causes of visual impairment were untreated cataract (48.8%), glaucoma (16.3%), uncorrected refractive error (15.6%), and surgical complications (10.6%). This is similar to the findings of Nigerian National Blindness and Visual Impairment Survey, where the most common causes of mild visual impairment were uncorrected refractive errors (77.9%), untreated cataract (12.3%), uncorrected aphakia (1.2%), and glaucoma (1.0%).^[7] Untreated cataract (53.0%), uncorrected refractive errors (25.0%), and surgical complications (11.0%) were the most common causes of moderate visual impairment, whereas the most common causes of blindness were untreated cataract (37.5%), glaucoma (33.3%), couching (10.4%), and surgical complications (8.3%).^[7] It is important to note that untreated cataract, glaucoma, uncorrected refractive error, and couching were the top common causes of all categories of visual impairment. This finding is similar to the results from other study in Nigeria,^[7] where the major causes of mild visual impairment were refractive error (77.9%), cataract (12.3%), uncorrected aphakia (1.2%), and glaucoma (1.0%). However, these findings differ from the global causes of visual impairment which include: uncorrected refractive errors (43%), cataracts (33%), glaucoma (2%), ARMD, diabetic retinopathy, trachoma, and corneal opacities each 1.0%.^[2] Causes of blindness globally includes cataract (51%), glaucoma (8%), ARMD (5%), childhood blindness, and corneal opacities 4%, uncorrected refractive error, and trachoma 3.0% among others.^[2]

In this study, more than 96.8% of causes of visual impairment and 95% of blindness were avoidable. This finding mirrors the VISION 2020 estimate of avoidable blindness of 80%.^[7] The fact that the majority of causes of visual impairment and blindness are avoidable points to the need to establish a well-organized eye-care program which is lacking in the study as well as the state.

CONCLUSION

The prevalence and magnitude of visual impairment and blindness were found to be high in the study area. In addition, most causes of visual impairment and blindness in Jos North LGA of Plateau State are avoidable. There is, therefore, a need to develop an organized and effective eye-care program as well as integrate eye care into the existing health-care services in the study area and the state at large so as to reduce the burden of visual impairment and blindness. The eye-care program should focus on providing services for cataract surgeries, glaucoma screening and treatment, and refractive error to reduce the burden and causes of visual impairment.

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Conflicts of interest

There are no conflicts of interest.

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