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Demographic Assessment of Low Vision in Niger State, Nigeria.

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Abstract

Purpose: The study was conducted to assess the demographic distribution of low vision in Niger State, Nigeria.

Methods: The retrospective cross-sectional study design was adopted. The study sample consisted of 306 low vision patients selected from a total of 12,960 clinical records of patients seen over a 5-year period (2012-2016) in three selected public hospitals in Niger State. Diagnostic criterion for low vision was based on World Health Organization (WHO) definition. Data were analyzed using the Statistical Package for the Social Sciences (SPPS) version 21.0.

Results: The prevalence rate of low vision was 2.36%. There were more males (184; 60.1%) than females (122; 33.9%). The males had a higher proportion of the middle-aged (36-55 years; 33.7%) while the females had more of older adults/elderly (≥ 56 years; 33.6%). Low vision was most prevalent among students (39.2%). Glaucoma (118; 38.6%) was the leading cause of low vision. Albinism accounted for more than half (16/31) of low vision cases amongst children while glaucoma (37/91) and cataract (38/91) accounted for 82.5% of low vision cases among older adults/elderly. The majority (115; 37.6%) of patients had severe low vision (VA < 6/60 to 3/60). The uptake of low vision devices was high (217; 70.9%) and the spectacle magnifier (70; 22.9%) was mostly dispensed.

Conclusion: The study has provided baseline information on the demographics of low vision in Niger State, Nigeria which could be the basis for the planning of low vision services in the State.

Keywords: Demographic, assessment, low vision, Niger State, Nigeria.

Introduction

A working definition of low vision was designed in the report of the WHO Consultation on Management of Low Vision in Children[1], and the visual criteria included in the definition refer to acuity in the better eye with correction: A person with low vision is one who has impairment of visual functioning even after treatment and/or standard

1. World Health Organization. Management of low vision in children: report of a WHO consultation, Bangkok, 23-24 July 1992. Geneva: WHO/PBL/93.27.[internet]. 1993.[Accessed 2017 October 16] Available from http//www.who.int/iris/handle/10665/61105

refractive correction, and has a visual acuity of less than 6/18 to light perception, or a visual field less than 10 degrees from the point of fixation, but who uses, or is potentially able to use vision for the planning and/or execution of a task[1].The WHO definitions of low vision based solely on visual acuity were not appropriate[2] and there is need for one stated in functional terms. Functional vision is a person's ability to integrate the components of vision effectively to accomplish a task[3]. Low vision has been defined differently but the fundamental concept remains unchanged which is the limitation or loss of visual function that interferes with one's ability to function independently, to perform activities of daily living, and/or to travel safely[4]

A useful way to think of the types of problems the patient may encounter is to use functional terms to classify the type of visual impairment with respect to the presence of a visual field defect[5]: (a)No visual field defect, but a loss of resolution or contrast throughout the entire visual field; general haze, glare or blurring of vision e.g. cataracts, albinism, amblyopia, achromatopsia etc, (b) Central visual field defect e.g. age-related macular degeneration (ARMD), macular hole, Stargardt's disease, myopic maculopathy etc; and (c)Peripheral visual field defect e.g. glaucoma, retinitis pigmentosa, retinal detachment, optic atrophy etc.

It is estimated that 285 million people are visually-impaired worldwide; 39 million are blind and 246 million have low vision[6].The prevalence of low vision in Africa has been reported to be 3%[7] with considerable regional variations[8]. Studies in Nigeria have revealed variations in the magnitude of low vision in different parts of the country, for example, prevalence of low vision was found to be 5.7% in Benin[9], 8% in Ojo[10], 16.7% in Imo State[11] etc. These variations highlight the differences in the ages of the patients, the causes of low vision, and the methods of the data collection employed.[12]. The overall prevalence of low vision was significantly associated with age in both children and adults[13.] The prevalence of low vision was found to be statistically higher in older children (12-17years old) than among younger ones (6-11 years old).[14] Among adults, the prevalence of low vision increases significantly with increasing age.[11,16] Prevalence of low vision was higher among adults (≥40 years; 5.3%) than among children (10-15 years; 1.2%).[15,17,]

1. World Health Organization. Management of low vision in children: report of a WHO consultation, Bangkok, 23-24 July 1992. Geneva: WHO/PBL/93.27.[internet]. 1993.[Accessed 2017 October 16] Available from http//www.who.int/iris/handle/10665/61105
2. World Health Organization. Global initiative for the elimination of blindness: action plan 2006-2011. [internet]. 2007. [Accessed 2017 October 16] Available from : http://www.iapb.org/resources/vision-vision-2020-action-plan-2006-2011
3. Faye EE, Albert DL, Freed B, Seidman KR, Fischer M. The lighthouse ophthalmology resident training manual. A new look at low vision. Lighthouse International (NY): 2000. p. 3.
4. West SK, Rubin GS, Broma AT. How does visual impairment affect performance on tasks of everyday life? Arch Ophthalmol. 2002; 120: 774-80.
5. Moore JE, LeJeune BJ. Low vision. Encyclopedia of rehabilitaion. Centre for International Rehabilitation, Research Information and Exchange. New York. 2010: p 2-3.
6. World Health Organisation. Visual impairment and Blindness. Fact Sheet; 2014. [Accessed 2019 February 8]. Available from: http://www.who.int/mediacentre/factsheets/fs282/en/
7. World Health Organization. Magnitude and causes of visual impairment. Fact sheet No. 282. 2004. [Accessed 2019 February 8]. Available from http://iapbwesternpacific.org /reports data/worldhealthorganization/WHO_282
8. Jutai J, Hooper P, Strong G, Cooper L, Hutnik C, Sheidov T, *et al*. Vision Rehabilitation: Evidence-based review. Terminology, demography and epidemiology of low vision. 2005 p. 1- 62.
9. Akpalaba RUE, Asonye CC. Low Vision in Benin Nigeria-Etiology and age characteristics. J Afr C Optom. 2004; 1(1):34-40.
10. Akinlabi GA, Ojoh O, Ajayi OB. Prevalence and causes of low vision in the Nigerian Naval Hospital-A case study. Optom Educator. 2001; 2(2):4-12.
11. Megwas AU, Iwuagwu FO, Opara MC. Prevalence and causes of Low Vision in Imo State. Bl & LV J, 2012; 1: 29-31.
12. Oduntan AO. Prevalence and causes of low vision and blindness worldwide. S Afr Optom. 2005; 64(2):44-54.
13. Gilbert CE, Ellwein LB; Refractive Error Study in Children Study Group. Prevalence and causes of functional low vision in school-age children: results from standardized population surveys in Asia, Africa, and Latin America. Invest Ophthalmol Vis Sci. 2008; 49 (3):877-881. doi:10.1167/iovs.07-0973
14. Kingo AU, Ndawi BT. Prevalence and causes of low vision among schoolchildren in Kibaha District, Tanzania. Tanz J Hlth Res. 2009;11(3):111-115
15. Nigerian Federal Ministry of Health (2007). The Nigeria National Blindness and Visual Impairment Survey 2005-2007. Retrieved from http://pbunion.org/Countriessurveyresults/Nigeria/Nigeria_survey_Summary_report.pdf
16. Ahuama OC, Awazie T, Esenwa EC. Major causes of low vision and blindness in Abia State. Bl LV J, 2012; 1:40-3.
17. Abdull MM, Sivasubramaniam S, Murthy GV, Gilbert C, Abubakar T, Ezelum C, Rabiu MM, Nigeria National Blindness and Visual Impairment Study Group Causes of blindness and visual impairment in Nigeria: the Nigeria national blindness and visual impairment survey. Invest Ophthalmol Vis Sci. 2009; 50(9):4114–4120.

The leading causes of low vision (visual impairment) and blindness are cataract[18,19,20,21] and glaucoma.[22,23,24,25] Other causes include age-related macular degeneration[11,24,25], retinitis pigmentosa[9,22,23] and optic atrophy.[9,11,16,25]

About 90% of the world's visually impaired live in developing countries[6]. In such countries like Nigeria, low vision and blindness constitute a major public health concern. Also, the vast majority of population lives in the rural areas where blindness is associated with considerable disability and excess mortality resulting in huge economic and social consequences[26,27]. The significant negative impact of visual impairment on the well-being and quality of life of individuals of all ages have been documented[28], and can, in many cases, be lessened by appropriate vision rehabilitation, including optometric low vision intervention[29]. Although there is no possibility of reversing the visual impairment in low vision patients, people with the condition can return to an active, productive, rewarding and independent lifestyle with low vision devices and rehabilitation training[30, 31].

The need for low-vision services is often not fully recognized, owing to inadequate epidemiological data on the prevalence and causes of functional low vision. This information is needed for planning services. In some national VISION 2020 plans, planning for low-vision services is inadequate, yet one of the WHO's action plan indicators is the number of persons with functional low vision who have access to low-vision services[2]. Prior to this study, no data existed on low vision in Niger State. This study, therefore, is a quest into the causes of low vision in Niger State, the demographic characteristics and any correlation between low vision and the distribution variables.

Methods

Study setting: The study was carried out in Niger State, Nigeria. The state occupies about 10% of the total land area of Nigeria making it the largest of the thirty six states in terms of land mass. The 2006 population and housing census put the State's population at 3,950,249.[19] The three public hospitals which provide low vision services and receive referrals from all over the state for low vision assessment were used. They are located in the major zones of the state.

Study design: The retrospective cross-sectional study was adopted.

Sampling procedure/sample size: Out of a total of

2. World Health Organization. Global initiative for the elimination of blindness: action plan 2006-2011. [internet]. 2007. [Accessed 2017 October 16] Available from : http://www.iapb.org/resources/vision-vision-2020-action-plan-2006-2011
6. Berhane Y, Worku A, Bejiga A, Adamu L, Alemayehu W, Bedri A, et al. Prevalence and causes of blindness and low vision in Ethiopia. Ethiopian J Hlth Dev. 2007; 21:204–210.
9. Akpalaba RUE, Asonye CC. Low Vision in Benin Nigeria-Etiology and age characteristics. J Afr C Optom. 2004; 1(1):34-40.
11. Megwas AU, Iwuagwu FO, Opara MC. Prevalence and causes of Low Vision in Imo State. Bl & LV J, 2012; 1: 29-31.
16. Ahuama OC, Awazie T, Esenwa EC. Major causes of low vision and blindness in Abia State. Bl LV J, 2012; 1:40-3.
18. Guzek JP, Anyomi FK, Fiadoyor S, Nyonator F. Prevalence of blindness in people over 40 years in the Volta Region of Ghana. Ghana Med J. 2005; 39 (2): 55-62.
19. Adegbehingbe BO, Fayemilehin BR, Ojofeitimi EO, Basiriyu LA. Blindness and visual impairment among the elderly in Ife-Ijesha zone of Osun State, Nigeria. Indian J Ophthalmol. 2006; 54(1): 59-62.
20. Ahuama OC, Nwala OR, Opara OS. Major causes of blindness in Imo State, Nigeria. Bl LV J. 2014; 3:43-5.
21. Akpalaba RUE, Idogho OB. Low vision in children and adolescents: Hospital-based study. J Afr C Optom, 2006;13:19-27.
22. Ekpenyong BN, Ndukwe OC. Provision of low vision service in the Department of Ophthalmology, University of Calabar Teaching Hospital. J Nig Optom Assoc. 2010; 16: 34-8.
23. Adamu M, Muhammad N. Low vision services in Sokoto state. Borno Med J. 2014; 11(1):33-40
24. Atanya GN, Amiebenomo OM. Prevalence and causes of blindness and visual impairment in Kwale, Delta State Nigeria. Bl LV J. 2014; 3: 59-61.
25. Awurum, A. Causes of visual impairment in Nigerian Navy Reference Hospital, Ojo. Bl LV J. 2014. 3:50-1.
26. Taylor HR, Pezzullo ML, Keeffe JE. The economic impact and cost of visual impairment in Australia. Br J Ophthalmol. 2006; 90:272-5
27. Frick KD, Foster A. The magnitude and cost of global blindness: An increasing problem that can be alleviated. Am J Ophthalmol. 2003; *135*: 471–6.
28. O'Connor PM, Keeffe JE. Focus on low vision. [internet]. 2007. [Accessed 2019 February 8] Available from https://www.cera.org.au/publication.
29. Stelmack J. Quality of life of low vision patients and outcomes of low vision rehabilitation. Optom Vis Sci.2001; 78(5):335-42.
30. Kupfer C. The low vision education program: Improving quality of life. Optom & Vis Sci. 1999; 76:729-730.
31. Massof RW. A systems model for low vision rehabilitation. Basic concepts. Optom & Vis Sci. 1995; 72:725-736.

12,960 clinical records of patients who attended the three selected public hospitals over a 5-year period (2012-2016), 306 clinical records of low vision patients were selected.

Inclusion criteria: Patients with diagnosis of low vision made after assessment by qualified and licensed ophthalmologists and optometrists, and who have a visual acuity of less than 6/18 to light perception in the better eye after correction[1] were included for the study.

Exclusion criteria: Those who did not meet the inclusion criteria were excluded from the study

Data collection: Data collected were secondary as they were retrospectively derived from the clinical records. The data collection tool was the data spread sheet. The distribution of low vision according to age, gender, occupation, etiology, degree of impairment by best corrected visual acuity, and low vision devices dispensed were profiled. Data were analyzed using the Statistical Package for the Social Sciences (SPPS) version 21.0.

Ethical approval: Ethical approvals were obtained from the Research Ethics Committees of the Niger State Ministry of Health (Ref No: MOH/CMH/1151/1) and the selected public hospitals (The Federal Medical Centre, Bida (Ref No: FMCB/HCS/HREC/APPR/VOL.1/59)., General Hospital Minna (HMB/GHM/STA/136/VOL.III/454) and General Hospital, Suleja (HMB/GHS/HS/16/11/16)

Results

Prevalence of low vision

Out of a total of 12,960 clinical records reviewed for the study over the five-year period (2012 – 2016), 306 (2.36%) patients had low vision. The age of low vision patients ranged between 5 – 90 years, with a mean age of 42.6 ± 19.8 years (95% CI of mean = 40.4 – 44.8). There were more males 184 (60.1%) than females 122 (39.9%) who had low vision (Table 1). The mean age of the males was 42.3 ± 19.7 years (95% CI of mean = 39.5 – 45.2) while that of the females was 43.1 ± 20.0 years (95% CI of mean = 39.5 – 46.6).The age difference between male and female participants was not significant (MD = 0.75, t = 0.32, p = 0.75) (Table 1). The middle-aged adults accounted for about one third (33.7%) of the male patients and this was closely followed by young adults (30.4%). The age distribution was quite different among the female patients, having a higher proportion of older adults, aged 56 years and above (33.6%), as well as children (13.1%) (Table 1).

The occupational distribution showed that the majority of the patients with low vision were students (n= 120; 39.2%) followed by civil servants (n= 73; 23.9%). The least were applicants (n=13; 4.5%) (Figure 1).

Glaucoma was found to be the leading cause of low vision accounting for 118 (38.8%) followed by macular degeneration 62 (20.4%) and cataract 43 (14.1%) as shown in Figure 2. These three causes cumulatively accounted for 73.3% of the 306 cases of low vision. Other causes of low vision identified in the study included non-glaucomatous optic neuropathy 36(11.8%), albinism 18(5.9%), retinitis pigmentosa 8(2.6%), degenerative myopia 8(2.6%), corneal opacity 8(2.6%) and retinopathy 2(0.7%). Causes of low vision differed according to age

1. World Health Organization. Management of low vision in children: report of a WHO consultation, Bangkok, 23-24 July 1992. Geneva: WHO/PBL/93.27.[internet]. 1993.[Accessed 2017 October 16] Available from http//www.who.int/iris/handle/10665/61105

group (Table 2). Albinism accounted for more than half (16/31) of low vision cases amongst children (less than 18 years). For young adults (18 to 35 years), 45.8% (38/83) of cases were due to macular degeneration, while glaucoma was responsible for 64.6% (64/99) of cases among middle-age adults (36 to 55 years). Causes of low vision among older adults/elderly (56 years and above) are mainly due to glaucoma (37/91) and cataract (38/91), both conditions accounting for 82.5% of low vision cases among the elderly.

The distribution of the categories of low vision using visual acuity (VA) as criteria showed that majority (n= 115, 37.6%) of the patients had severe low vision (VA <6/60 to 3/60) followed by moderate low vision (VA< 6/18 to 6/60) (n=87, 28.4%) (Table 3). (Near-total blindness (VA < 1/60 to light perception) accounted for the least (n=6, 2.0%). Table 3 also showed that there was male dominance across all categories of low vision. However, there was no statistically significant relationship between categories of low vision and patient gender (χ^2 = 2.78, p = 0.25).

Figure 3 shows the low vision devices dispensed to the patients. For 218 (71.2%) patients, low vision devices were dispensed while for 88 (28.8%) none was dispensed. Spectacle magnifier was the commonly dispensed low vision device being dispensed for 70 (22.9%) of the 306 patients with low vision and represented 32.1% of the 218 dispensed LVDs. In 13 (4.2%) of the patients a combination of spectacle magnifier and hand magnifier were dispensed.

Table 1. Age and sex distribution of low vision patients in Niger state, Nigeria (2012-2016)

Age (years)	Sex		Total
	Male (n %)	Female (n %)	
< 18 years	16 (8.7%)	16 (13.1%)	
18 to 35 years	56 (30.4%)	28 (23%)	
36 to 55 years	62 (33.7%)	37 (30.3%)	
56 years & above	50 (27.2%)	41 (33.6%)	
	184(60.1%)	**122(39.9%)**	**306 (100%)**
Range	5-90 years	6-81 years	5-90 years
Mean ± SD	42.3 ± 19.7	43.05 ± 20.0	42.6 ± 19.8
95% CI	39.5 to 45.2	39.5 to 46.6	40.4 to 44.8
t	0.32		
P	0.75		

t = t-test statistics

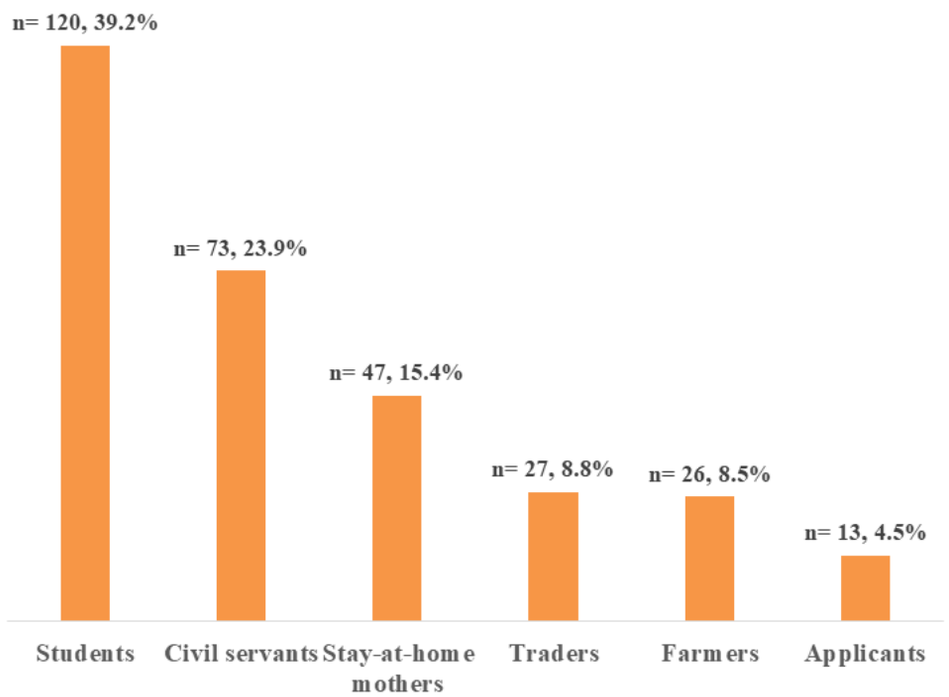

Figure 1. Occupational distribution of low vision patients in Niger state, Nigeria (2012 – 2016).

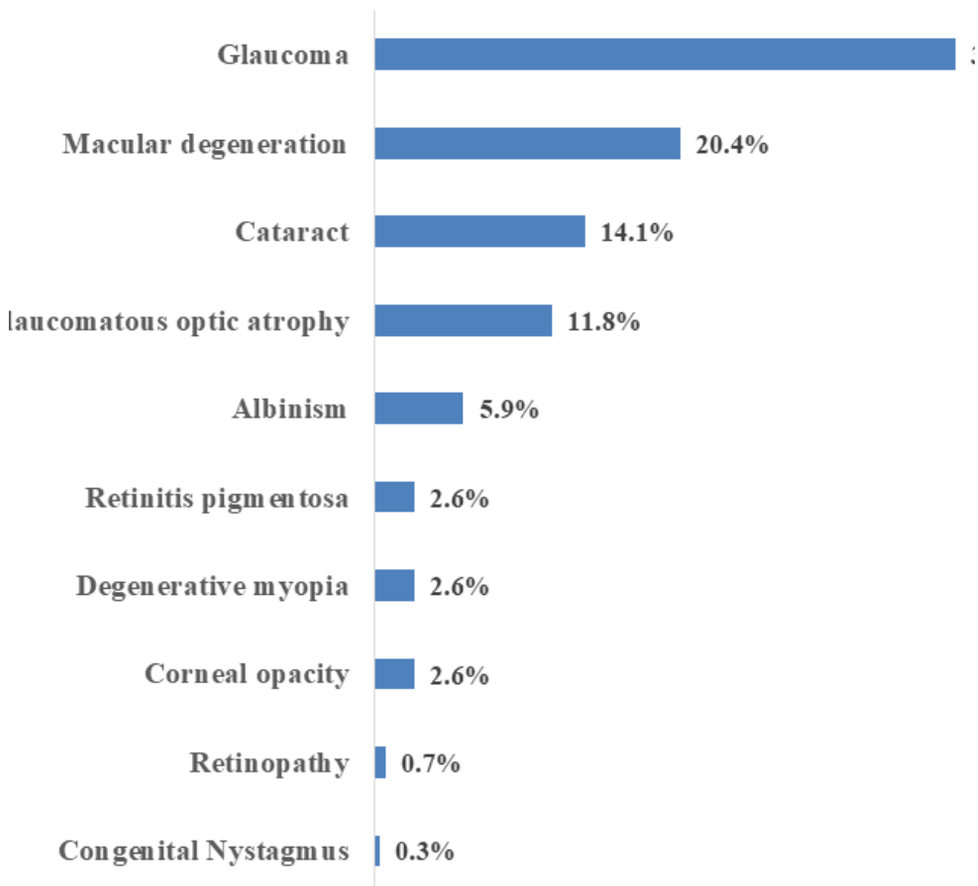

Figure 2. Causes of low vision among patients in Niger state, Nigeria (2012 – 2016).

Table 2. Major causes of low vision across patient age groups in Niger state, Nigeria (2012 – 2016).

Age group	Causes	Proportion within age group
Children (< 18 years)	Albinism	51.6%
Young Adults (18 to 35 years)	Macular degeneration	45.8%
Middle-age adults (36 to 55 years)	Glaucoma	64.6%
Older adults/Elderly (56 years & above)	Cataract, Glaucoma	41.8%, 40.7%

Table 3. Category of low vision (using VA as criteria) and patient gender in Niger state, Nigeria (2012 – 2016)

	Male (n %)	Female (n %)	Total (n %)
Moderate	58 (31.5)	29 (23.8)	87 (28.4)
Severe	69 (37.5)	46 (37.7)	115 (37.6)
Profound	53 (28.8)	45 (36.9)	98 (32.0)
Near-total blindness	4 (2.2)	2 (1.6)	6 (2.0)
	184(60.1)	**122(39.9)**	**306 (100)**

Chi-square statistics (χ^2)= 2.78 *p-value* = 0.25

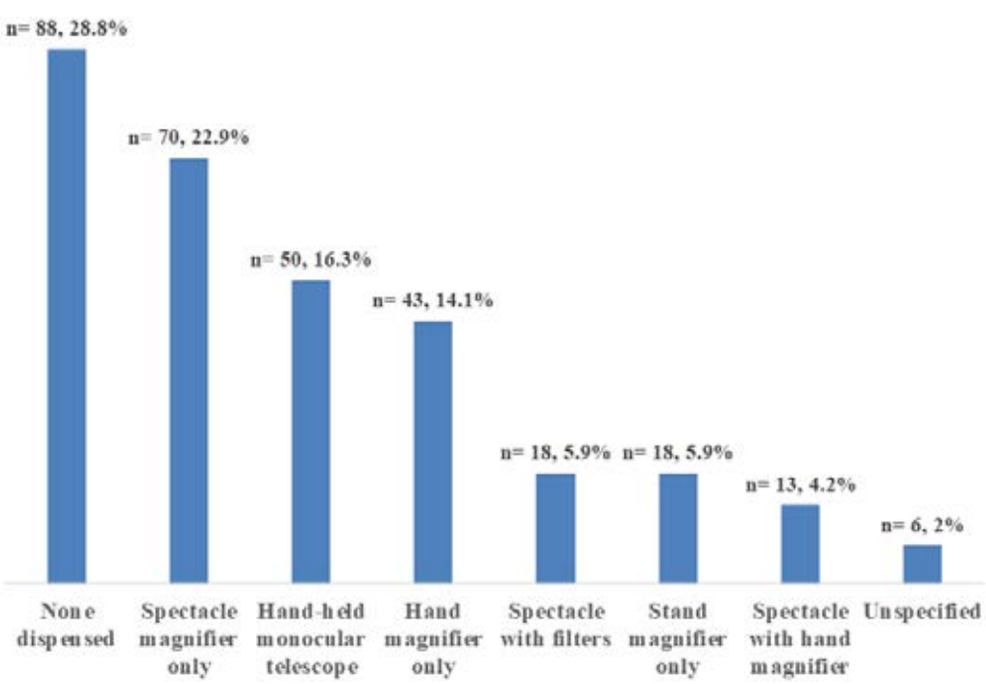

Figure 3. Low vision devices dispensed to low vision patients in Niger state, Nigeria (2012 – 2016).

Discussion

The higher proportion of males than females in all the reviewed clinical records including those with low vision showed that more males visited the clinics and sought eye care for their eye health conditions, and also accessed low vision services than did females[33]. This is in agreement with the findings of other studies[20,34,35] and holds true about women in Northern Nigeria who may face more than double rigors to scale through the huddles of limited access to quality education, untreated health challenges, lack of skills and aspects of traditions hampering them (women) from contributing meaningfully to the economy[36].In contrast however, some other studies showed that there were more females who had low vision and blindness than males[15,18,37,38] and it was argued that since women generally have a longer life expectancy than men and many eye diseases are age-related, it would be expected for women to have a higher burden of visual impairment and blindness[39,40]. The result of this study also showed that the females who took part were older compared to the males. However, the age difference between male and female participants was not statistically significant.

The male-dominated study population consisted of more middle-aged and young adults. These age groups are characterized by high level of self-motivation and positive behavior to seek help/ intervention driven by the desire to learn, work, support self and be independent, which is a good prognostic factor for successful low vision care and/or rehabilitation. Also, these individuals are probably at the peak level of their formal education or stabilizing in their career path so they would find it difficult to cope with problems with visual impairment. On the other hand, the smallest proportion of patients with low vision was recorded among children and adolescents who are not old enough to take decisions on their own and to independently seek eye care. They would depend on their parents/guardians to take them to the hospital/ clinic and this in turn depended on the parent's/ guardian's knowledge about the eyes and vision problems, availability of funds, time, distance etc[41].

It was found that the majority of the patients with low vision were students. The major complaints from their recorded history revolved round visual difficulties in the classroom; inability to see the board and/or read prints from the book. This is consistent with previous findings.[42,43,44] The result which showed that civil servants who had low vision were the second highest in the study sample is in consonance with other findings[23,45]. These patients would be primarily concerned with securing and/or maintaining employment, workplace productivity,

15. Nigerian Federal Ministry of Health (2007). The Nigeria National Blindness and Visual Impairment Survey 2005-2007. Retrieved from http://pbunion.org/Countriessurveyresults/Nigeria/Nigeria_survey_Summary_report.pdf
18. Guzek JP, Anyomi FK, Fiadoyor S, Nyonator F. Prevalence of blindness in people over 40 years in the Volta Region of Ghana. Ghana Med J. 2005; 39 (2): 55-62.
20. Ahuama OC, Nwala OR, Opara OS. Major causes of blindness in Imo State, Nigeria. Bl LV J. 2014; 3:43-5.
23. Adamu M, Muhammad N. Low vision services in Sokoto state. Borno Med J. 2014; 11(1):33-40
33. Abou-Gareeb I, Lewallen S, Bassett K, Courtright P. Gender and blindness: a meta-analysisof population-based prevalence surveys. Ophthalmic Epidemiol. 2001 Feb; 8(1):39-56. [PubMed: 11262681]
34. Ejukonemu BOM. Characteristics of the Nigeria low Vision population. J Nig Optom Assoc. 2004; 11:6-10.
35. Muhammad N, Mansur RM, Dantani AM, Elhassan E, Isiyaku S. Prevalence and causes of blindness and visual impairment in Sokoto State, Nigeria: Baseline Data for Vision 2020: The Right to Sight Eye Care Programme. Mid East Afr J Ophthalmol. 2011; 18(2): 123-8.
36. Anote A. Harnessing the potential of women in Northern Nigeria. The Guardian. [newspaper on the internet] 2017 Aug 12 [cited 2019 Feb 15]. Available from: https://m.guardian.ng/guardian-woman/harnessing-the-potential-of-women-in-northen-nigeria-2/
37. Timothy CO, Onu NO, Okoye II. A survey of blindness and low vision in some rural communities in Anambra State of Nigeria. Bl & LV J. 2014; 3:73-5.
38. Monsudi KF, Saka ES, Azonobi RI. Pattern of eye diseases present at free outreach in rural community in the Northwestern Nigeria. Sudan Med Monit. 2015; 10: 113-6.
39. Courtright P. Gender and blindness: Eye diseases and use of eye care services. Comm Eye Hlth J. 2003; 16(52):11-2.
40. Ulldemolins AR, Lansigh VC, Valencia LG, Carter MJ, Eckert KA. Social inequalities in blindness and visual impairment: a review of social determinants. Indian J Ophthalmol. 2012. 60(5): 368-75.
41. Amiebenomo DC, Achugwo DC, Abah I. Parental knowledge and attitude to children's eye care services. Niger J Paediatr. 2016; 43 (3): DOI:http://dx.doi.org/10.4314/njp.v4313.11
42. Ejukonemu BOM. The socio-economic implications of unattended true low vision in Africa. J Nig Optom Assoc. 2014; 3:62-4.
43. Mabaso RG, Oduntan OA. Risk factors for visual impairment and blindness amongst black adult diabetics receiving treatment at Government healthcare facilities in Mopani District, Limpopo province, South Africa. Afr J Prm Health Care Fam Med. 2014; 6(1), Art. #623, 8pages. Available from http://dx.doi.org/10.4102/phcfm.v6i1.623.
44. Freeman KF, Cole RG, Faye EE, Freeman PB, Goodrich GL, Stelmack JA. Care of the patient with visual impairment (low vision rehabilitation). Optometric clinical practice guideline: Reference guide for clinicians. Am Optom Assoc, USA. 2007. p. 2.
45. Duke R, Lewallen S, Courtright P. Estimated prevalence of monocular blindness and monocular severe visual impairment in children of Cross Rivers State, Nigeria. Nig J Ophthalmol. 2014; 22(2): 66-68

and independence, as well as maintaining a home and fulfilling family and social obligations[5].

Glaucoma was found to be the leading cause of low vision in Niger State and this is consistent with the findings from some studies.[22,25,46] On the other hand, cataract accounted for the third leading cause of low vision behind macular degeneration in Niger State- a finding which is contrary to the finding of most studies[16,21,47] and to the global estimates[48] which have it that cataract remains the leading cause of visual impairment in all areas of the world, except for developed countries. In the past few decades however, treatable or preventable disorders (such as cataract) have become a less common cause of low vision[49]. It has been suggested[50] that organized eye camps sponsored by non-governmental organizations can effectively minimize cataract blindness. Therefore, as a direct consequence of investments made by the state governments like Niger State and of interventions by national and international partners[51], there has been a drastic reduction in the prevalence of cataract evident in the result of this study. Unfortunately, cases of glaucoma and other vision-threatening conditions which cannot be handled in an eye camp because they require more thorough eye examinations and follow-up are referred to the nearest government hospitals. This could explain why glaucoma was found to be the commonest cause of low vision in this 'hospital-based' study.

Causes of low vision differed according to age group. Albinism which was also listed as one of the causes of low vision in some studies[25,52,53] was the major cause of low vision amongst children < 18 years accounting for more than half (16/31) of the cases among them. Only two out of the sixteen cases of albinism recorded were ocular while the remaining were oculocutaneous. All of them were found to have benefitted from spectacle correction with either tints, antireflection coating or filters and this is in agreement with a previous finding.[54] On the other hand, glaucoma was responsible for almost two-thirds of cases among middle-age adults (36 to 55 years) and in combination with cataract, both conditions were the major causes of low vision cases among the older adults/elderly (56 years and above). This finding agrees with other studies in which it was shown that the major causes of low vision especially glaucoma and cataract increase with age.[11,24]

On the category of low vision, the findings showed that the majority of the patients had severe low vision (VA < 6/60 to 3/60) and this is in consonance with previous studies.[8,55,56] Severity of visual impairment is a non-modifiable personal factor and the more severe the visual loss, the lower the employability,

5. Moore JE, LeJeune BJ. Low vision. Encyclopedia of rehabilitaion. Centre for International Rehabilitation, Research Information and Exchange. New York. 2010: p 2-3
8. Bastawrous A, Mathenge W, Wing K. Six-year incidence of blindness and visual impairment in Kenya: the Nakuru Eye Disease Cohort Study. Invest Ophthal Vis Sci. 2016; 57:5974–5983. DOI:10.1167/ iovs.16-19835
11. Megwas AU, Iwuagwu FO, Opara MC. Prevalence and causes of Low Vision in Imo State. Bl & LV J, 2012; 1: 29-31.
21. Akpalaba RUE, Idogho OB. Low vision in children and adolescents: Hospital-based study. J Afr C Optom, 2006;13:19-27.
22. Ekpenyong BN, Ndukwe OC. Provision of low vision service in the Department of Ophthalmology, University of Calabar Teaching Hospital. J Nig Optom Assoc. 2010; 16: 34-8.
23. Adamu M, Muhammad N. Low vision services in Sokoto state. Borno Med J. 2014; 11(1):33-40
24. Atanya GN, Amiebenomo OM. Prevalence and causes of blindness and visual impairment in Kwale, Delta State Nigeria. Bl LV J. 2014; 3: 59-61.
25. Awurum, A. Causes of visual impairment in Nigerian Navy Reference Hospital, Ojo. Bl LV J. 2014. 3:50-1.
46. Entekume G, Patel G, Sivasubramaniam S, Gilbert CE, EzeluM CC, Murthy GVS, Rabiu MM. Prevalence, Causes, and Risk Factors for Functional Low Vision in Nigeria: Results from the National Survey of Blindness and Visual Impairment. Invest Ophthalmol & Vis Sci. 2011; 52(9).
47. Fasina FO, Ajaiyeoba AI. Prevalence and causes of blindness and low vision in Ogun State, Nigeria. Afr J Biomed Res. 2003; 6: 63 – 7.
48. World Health Organisation. Blindness and vision impairment. Key facts. [internet] 2019. (Accessed July 2020) Available from https://www.who.int/news-room/fact-sheet/details/blindness-and-visual-impairment
49. Boonstra N, Limburg H, Tijmes N, van Genderen M, Schuil J, van Nispen R. Changes in causes of low vision between 1988 and 2009 in a Dutch population of children. Acta Ophthalmologica, 2012; 90: 277–286. doi:10.1111/j.1755-3768.2011.02205.x
50. Adeoye A. Survey of blindness in the rural communities of South West Nigeria. Trop Med Int Hlth, 1996; 1:672-6.
51. World Health Organization. Global data on visual impairments 2010. WHO/NMH/PBD/12.01. Geneva. 2012. Retrieved from http://www.who.int/blindness/GLOBALDATAFINALforweb.pdf
52. Gothwal VK, Herse P. Characteristics of a paediatric low vision population in a private eye hospital in India. Ophthalmol & Physiol Opt, 2000; 20(3), 212-219.
53. Shah M, Khan M, Khan MT, Khan MY, Saeed N. Causes of visual impairment in children with low vision. J Coll Physicians Surg Pak. 2011; 21(2):88-92
54. Jhetam S, Mashige KP. Ocular findings and vision status of learners with oculocutaneous albinism. Afr Vision Eye Health. 2019; 78(1): a466. https//doi.org/10.4102/aveh.v78i1.466
55. Carvalho KM, Monteiro GB, Isaac CR, Shiroma LO, Amaral MS. Causes of low vision and use of optical aids in the elderly. Rev Hosp Clin Fac Med. 2004; 59(4): 157-160.

work participation and work performance of the individual[57]. This could explain the high proportion of patients with severe low vision who had sought a solution to the handicap associated with the degree of their visual loss by reporting to the hospital. A test of significance also showed that the category of low vision was not significantly associated with the gender of the patients. In other words, the severity of low vision was relatively similar across both genders: majority of both male and female low vision patients had severe and profound low vision. This is at variance with a previous study in which the difference in gender distribution and low vision was statistically significant in all age groups, being more severe in women[58].

Low vision devices were prescribed and dispensed for 218/306 (71.2%) of the low vision patients. This shows a high uptake of low vision devices and in agreement with some studies in which166/189 (87.8%) and 211/380 (55.5%) were reported respectively[59,60]. The spectacle magnifier which was dispensed for 23.2% of the low vision patients was the most commonly dispensed low vision device. This also is consistent with some other studies[22,23,61] which reported 41.3%, 46.6% and 41.6% respectively. Spectacle magnifiers provide large field of view[62] and they have high 'acceptability'[63].

It is worthy to note that this is the first time any similar study is being conducted in Niger State, Nigeria, and it covered the major zones in the state. However, since it is a hospital-based study, a population-based study is suggested to make-up for inaccurate clinical documentations and to establish more reliable epidemiological data on low vision in Niger State.

Conclusion

This study suggests that albinism and glaucoma cause a considerable proportion of low vision in children and adults respectively visiting the public hospitals in Niger State, Nigeria.

The study has also provided baseline information on the demographics of low vision in Niger State, Nigeria which could be the basis for the planning of low vision services in the State.

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56. Jitendrakumar1 SN, Tiwari N. Ocular morbidity among elderly population in rural areas of Bundelkhand. J. Dent Med Sci, 2016; 15(6): 05-10 doi: 10.9790/0853-1506080510 e-ISSN: 2279-0853, p-ISSN:
22. Ekpenyong BN, Ndukwe OC. Provision of low vision service in the Department of Ophthalmology, University of Calabar Teaching Hospital. J Nig Optom Assoc. 2010; 16: 34-8.
23. Adamu M, Muhammad N. Low vision services in Sokoto state. Borno Med J. 2014; 11(1):33-40
57. Josee D. Factors influencing work participation for people with a visual impairment. Information Monitoring Summary. Institut Nazareth et Louis-Braille. [internet] 2013; p 4. [Accessed 2019 February 10] Available from http://www.inlb.qc.ca/wp-15content/uploads/2015/01/
58. Woldeyes A, Adamu Y. Gender differences in adult blindness and low vision, Central Ethiopia Med J. 2008; 46(3):211-218.
59. Cho J, Cho P. Low vision findings in China and Hong Kong. In: Proceedings of the International Conference on Low Vision. 1996: 335–343.
60. Alotaibi AZ. A Retrospective Study of Causes of Low Vision in Saud Arabia, A Case of Eye World Medical Complex in Riyadh. Glob J Hlth Sci, 2015; 8(5): 205.
61. Khan SA. A retrospective study of low-vision cases in an Indian tertiary eye-care hospital. Indian J Ophthalmol, 2000; 48 (3): 201.
62. Lee SMY, Cho JCW. Low Vision devices for children. Comm Eye Health J. 2007; 20(62): 28-29.
63. Macnaughton J. Low Vision Assessment. Elsevier Butterwoth-Heinemann. Edinburgh. 2005; p. 108; 171-5.