Trends In The Utilization Of Low Vision Aids Among Patients At The University Of Port Harcourt Teaching Hospital: A 6-year Review

Onua AA, Ani EU

Abstract— **Objective: To identify the types of ophthalmological diagnoses, preferred low vision devices, demographic profile of clients utilizing low vision services atEye Clinic of University of Port Harcourt Teaching Hospital (UPTH) from 2013 to 2018. Methodology: A retrospective review of 6 years clinical records from the low vision clinic of UPTH - 2013 to 2018. Data extraction: Data on biodata of patients, ocular pathologies and patients' preferred low vision deviceswere obtained from the eye clinic out-patient register and entered into Microsoft Excel sheet using a template comprising of the ophthalmological diagnosis and year of diagnosis. Data analysis: Data from Microsoft Excel sheet were exported to SPSS version 25 for statistical analysis. Line graph was used to express trends in demographic profiles, ophthalmological diagnoses and preferred low vision devices. The absolute number of patients across the time period was presented in tables and figures. Trend analysis was performed using Chi square for trend statistics and statistical significance set at p≤0.5. Results: Patients in 41 – 50 age group showed a more step wise consistency in accessing our services. The trend in the utilization of low vision services among urban and rural dwellers had a step-wise increasing pattern in both instances. Glaucoma, oculocutaneous albinism were the most common cause of low vision. The preferred low vision aids were telescope and spectacle magnifiers.Conclusion:The trend of the utilization of low vision services in UPTH through a period of six years was undulating with improvement among rural dwellers and female folks.**

Index Terms— **Low vision, Trends, University of Port Harcourt Teaching Hospital..**

I. INTRODUCTION

Ocular diseases including low vision can affect an individual's quality of life, economic productivity and social challenges to the individual patients as well as economic burden to the society. The pattern of ocular diseases varies among countries of the world and is influenced by racial, geographic, socioeconomic, - age, gender and cultural factors[1-4]. The World Health Organization (WHO) defines low vision as "an impairment of visual function with a visual acuity of less than 6/18 to 3/60 in the better eye or a visual field of less than 10 degrees from the point of fixation, with the ability to use the vision for planning and/or execution of tasks for which vision is essential even after treatment and/or standard refractive correction[5]" Functional Low Vision"

Onua AA, Department of Ophthalmology, University of Port Harcourt, Nigeria.
Ani EU, The Ophthalmic Specialists Hospital, 37 Woji Road, GRA II, Port Harcourt, Nigeria.

(FLV) is more encompassing than the WHO definition of low vision which considers individuals who fall outside this definition (outside the boundaries of VA< 6/18 to 3/60) but could benefit from low vision services to achieve reasonable degree of function; such as those with a corrected VA of at least light perception (LP) in one or both eyes but who have, for example, paracentral scotomas, reduced contrast sensitivity, or pronounced photophobia[5,6].

The World Health Organization (WHO) currently estimates that about 285 million people are visually impaired worldwide of which 246 million has low vision[7]. About 90% of the world's visually impaired live in low-income settings[8,9]. The Nigerian National Survey of Blindness and Low Vision of 2005-2007, estimates the prevalence of low vision to be 3.5%; 95% CI, 3.1–3.9%)[10].

The common causes of low vision vary across the world. Age-related macular degeneration[11,12,13] appears to be the leading case of low vision in the more developed countries of the world while cataract, glaucoma, uncorrected refractive error, oculocutaneous albinism, retinitis pigmentosa and corneal opacity are the prominent causes of low vision in developing countries[10,14,15,16,17].

Majority of ocular morbidities which can lead to blindness are either potentially preventable or curable[9]. The profile and trend of low vision disorders in developing countries like ours will help in the planning and execution of healthcare policies that will ensure the reduction of ocular morbidity and consequently improve socioeconomic well-being of the citizens.

This study sets out to report the trend of low vision disorders seen at the Eye Clinic of University of Port Harcourt Teaching Hospital with a view to proffering scientifically-sound ways of reducing the burden of low vision in our locality. This result will certainly help in planning towards the prevention of visual impairment in the Niger Delta Region.

II. MATERIALS AND METHODS

A retrospective review of clinical records from the low vision clinic of UPTH from 2013 till 2018. All consecutive cases of low vision patients of all ages presenting at the Low Vision Clinic of the University of Port Harcourt Teaching Hospital within the study period were included in the study. This study was approved by the Institutional Ethics Review Board and was performed in accordance with the tenets of the Helsinki Declaration for research involving human subjects.

Data extraction: Data on low vision pathologies and the demographics of patients seen were obtained from the low vision clinic register and entered into Microsoft Excel sheet. Data analysis: Data from Microsoft Excel sheet were exported to IBM Statistical Package for Social Sciences version (SPSS) version 25 for statistical analysis. Relevant data were presented in tables and charts. Line graphs were used to express trends in demographic profiles, ophthalmological diagnoses and preferred low vision devices. The absolute number of patients across the time period was presented in tables and figures. Trend analysis was performed using Chi square for trend statistics and statistical significance set at p≤0.5.

III. RESULTS

One hundred and eight medical records of patients with varying causes and degrees of low vision were studied.

A. Table 1: Age and Gender Distribution of the Study Population

Age Group (Years)	Males	(%)	Females	(%)	Total	(%)
0-10	4	(4)	3	(3)	7	(7)
11-20	11	(10)	5	(5)	16	(15)
21-30	11	(10)	9	(8)	20	(18)
31-40	8	(7)	6	(6)	14	(13)
41-50	8	(7)	4	(4)	12	(11)
51-60	8	(7)	3	(3)	11	(10)
61-70	10	(9)	3	(3)	13	(12)
71 & Above	9	(8)	6	(6)	15	(14)
Total	69	(62)	39	(38)	108	(100)

*Pearson Chi Square Value=2.731   df =7   p-value=0.9*

The ages of the patients ranged from 2 to 81 years, with a mean age 41.4 ± 22.5 years. The Female: Male ratio was 1:1.8. Twenty patients representing 18%, were within the age group of 21 to 30 years. The difference in the ages of male and female participants in this study was not statistically significant (p=0.9) [Table 1].

B. Table 2: Distribution of the study population according to Age groups and year of assessing services

Age group (yrs)	2013	2014	2015	2016	2017	2018	Total	%	Chi Square	p-Value
0 – 10	-	-	-	-	3	4	7	7	1.347	0.975
11 – 20	2	6	4	-	3	1	16	15	2.672	0.876
21 – 30	8	4	1	3	1	3	20	18	2.734	0.023§
31 – 40	2	3	5	1	-	3	14	13	2.321	0.043§
41 – 50	1	-	3	3	3	2	12	11	1.245	0.034§
51 – 60	-	2	3	2	4	-	11	10	1.981	0.016§
61 – 70	-	1	4	3	3	2	13	12	2.213	0.036§
71 & ABOVE	2	3	5	1	1	3	15	14	2.134	0.025§
TOTAL (%)	15	19	25	13	18	18	108	100		

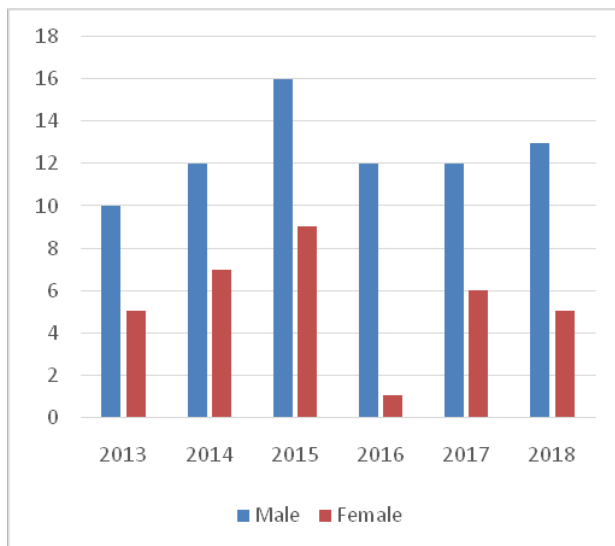§Trend analysis statistically significant p≤0.05

The general trend of clients (patients) accessing the Low Vision Clinic in UPTH was undulating and showed non-specific pattern. However, patients of age group 21-30 more frequently utilized the services of the clinic. Patients in 41 – 50 age group showed a more step wise consistency in accessing of our services. During the period of review, there was a steady increase in the number of patients seen in the clinic except in 2016 when there was a sharp drop in the total number of patients attended to in the clinic.
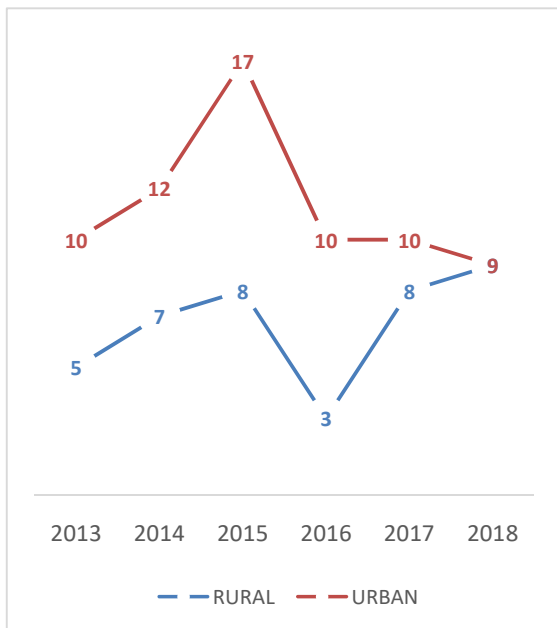
C. Figure1:Line graph for thetrend in the utilization of low vision services among urban and rural dwellers in the study population. Trend analysis statistically significant p≤0.05

The trend in the utilization of Low Vision Services among urban and rural dwellers in the study population had a step-wise increasing pattern in both instances throughout the period under review except in the year 2016 when there was a down trend of patients' utilization of the low vision services. More urban dwellers utilized the services of the clinic throughout the period under review.

D. Figure2:Chart showing the trend in the utilization of low vision services among males and females in the study population. Trend analysis statistically significant p≤0.05

There was a steady greater number of males accessing the services of low vision clinic than females during the period under review. The trend in females utilizing the services of low vision clinic was undulating: The number of females

increased from 2013 to peak in 2015 after which there was a decline in 2016 and rising in 2017 to decline slightly in 2018.
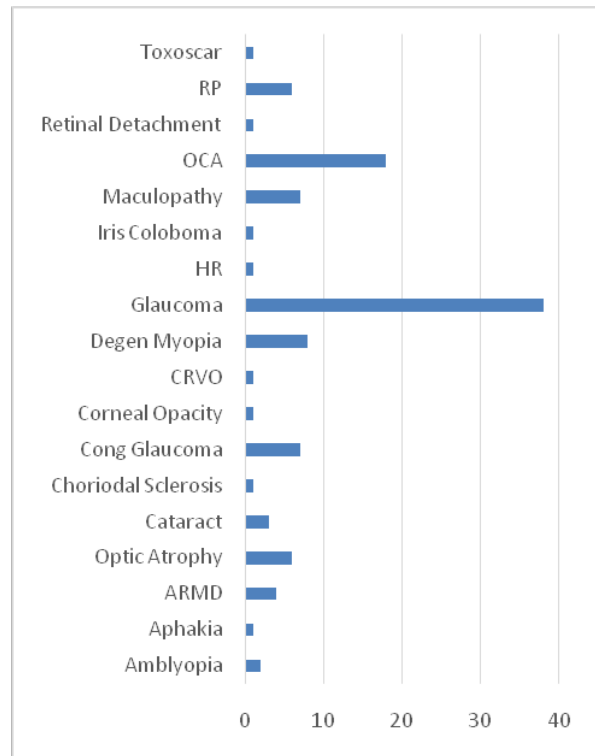

E. Figure 3: Causes of low vision in the study population

The causes of low vision in the study population were glaucoma (35.2%), followed by oculocutaneous albinism (16.7%) and degenerative myopia (7.4%). Others were maculopathy (7%), congenital glaucoma (7%), retinitis pigmentosa (6%), optic atrophy (6%) and Age Related Macular degeneration (3.7%).
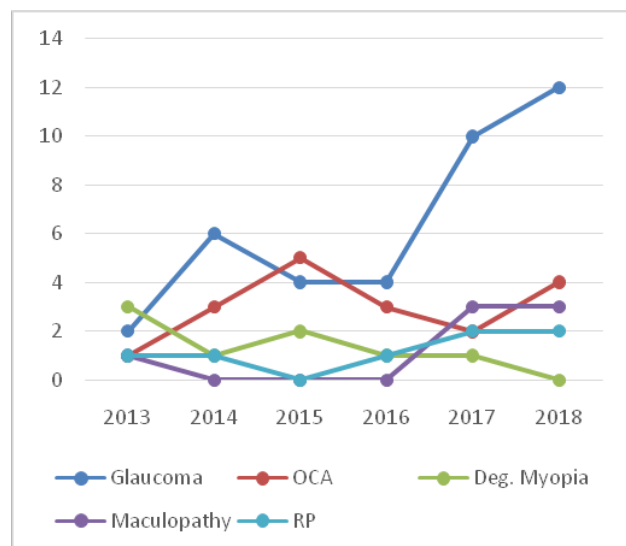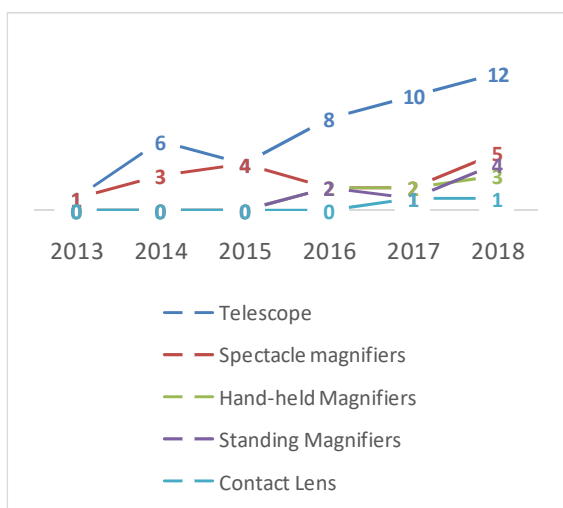

F. Figure 4: Line graph depicting the trend in the 5 major etiological factors of low vision among the study participants. Trend analysis statistically significant p≤0.05

The five most common etiological factors of low vision during the period under review were glaucoma, oculocutaneous albinism, degenerative myopia, maculopathy and retinitis pigmentosa. The trend in the frequency of occurrences of these diseases during the period under review was undulating with peaks in the years - 2014,2015,2017 and 2018.
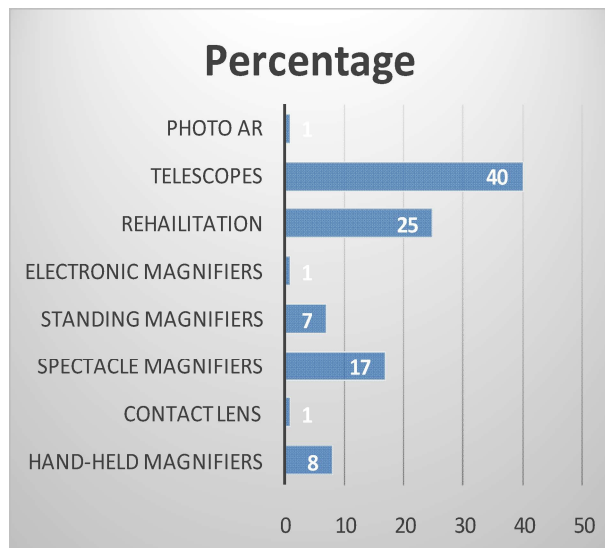
G. Figure 5: Preferred low vision aids among the study population

The preferred low vision aids during the period under review were telescope, spectacle magnifiers, hand-held magnifiers, standing magnifiers, contact lenses, photo-antireflective lenses and electronic magnifiers.

H. Figure 6: Line graph showing the trend in the 5 most preferred low vision aids among the study participants. Trend analysis statistically significant p≤0.05.

The five most preferred low vision aid during the period under review were telescope, spectacle magnifiers, hand-held magnifiers, standing magnifiers and contact lenses. The trend in the frequency of preference of telescope had a steady

step-wise increase except for a slight drop in 2015. Also, spectacle magnifier was increasingly demanded throughout the period under review except in 2016.

I. DISCUSSION

Low vision service Clinic in the ophthalmology department of the University of Port Harcourt Teaching Hospital (UPTH) was established in 2013. It runs every Wednesdays by an optometrist trained in low vision under the supervision of a consultant ophthalmologist. The clinic serves as a catchment center for patients in Rivers State and its environs as well as referral center for other hospitals in the neighboring states of Bayelsa, Abia, Imo and Delta states in Nigeria.

This study is a 6-year review of the trend of the utilization of low vision services in thecenter from its inception in 2013 to 2018. It is a retrospective study, in which 108 clinical records of low vision patients who utilized our services were reviewed. The ages of the patients ranged from 2 to 81 years, with a mean age 41.4 ± 22.5 years. The female: male ratio was 1:1.8. A high proportion of the study population, 20 (18%), were within the younger age group of 21 to 30 years. The difference in the ages of male and female participants in this study was not statistically significant (p=0.9) [Table 1].

During the period under review, the general trend of clients (patients) accessing the Low Vision Clinic in UPTH was undulating and showed non-specific pattern. However, patients of age group 21-30 more frequently utilized the services of the clinic. Patients in 41 – 50 age group showed a more step wise consistency in accessing of our services. During the period of review, there was a steady increase in the number of patients seen in the clinic.This trend was statistically significant among the various age groups during the period under review expect in the age groups 0 – 10 and 11 – 20 years (p≤0.05) [Table 2]. However, in the year 2016, there was a sharp decline in the total number of patients attended to in the clinic. The reason for this drop in the number of clients utilizing the low vision services could be attributed to the industrial strike action embarked upon by various trade unions in the health sector in Nigeria. This study corroborates with that of Cookey et al[18]in terms of undulating trend in the presentation of ocular morbidities in the outpatient ophthalmic clinic, university of Port Harcourt teaching Hospital for a period of eleven years (2006 to 2016).

The trend in the utilization of Low Vision Services among urban and rural dwellers in the study population had a step-wise increasing pattern in both instances throughout the period under review [Figure 1]. The Line graph for the trend in the utilization of low vision services among urban and rural dwellers in the study population was statistically significant p≤0.05. However, it was observed in this study that more urban dwellers utilized the services of the clinic throughout the period under review than their rural counterparts. The geographical situation of the low vision clinic in Port Harcourt city coupled with possible more awareness of low vision services among urban dwellers could be reasons for the observed disparity.

In this study, it was found that there was a steady greater number of males accessing the services of low vision clinic than females throughout the period under review. This finding

corroborates with the observations of the Nigerian national blindness and visual impairment survey, 2005–2007, Onua et al the burden of blindness in Emohua Local Government Area, Rivers State, Nigeria, Ejimadu and Pedro-Egbe in Ikwerre Local Government Area, Nigeria[8,19-22]. In this study, there was observed difference among the male and female folks in health-seeking behavior and uptake of low vision services. Women, probably are prohibited by some traditions and cultures from leaving their homes even when they need for medical attention without the permission of their husbands. Also, women are expected to take care of their homes and raise children while the men go out to fend for the families and therefore, have less socioeconomic strength.

This our study reveals that the trend in females utilizing the services of low vision clinic was undulating: However, the number of females increased from 2013 to peak in 2015 after which there was a decline in 2016 and rising in 2017 to decline slightly in 2018 [Figure 2] The Chi square trend analysis in the gender disparity in the use of the low vision facility was statistically significant p≤0.05.

In this study, we observed that the causes of low vision in the study population were glaucoma (35.2%), followed by oculocutaneous albinism (16.7%) and degenerative myopia (7.4%). Others were maculopathy (7%), congenital glaucoma (7%), retinitis pigmentosa (6%), optic atrophy (6%) and Age-Related Macular degeneration (3.7%) [Figure 3]. Glaucoma is known to be a major etiological factor of visual impairment in our environment, this was also the finding in previous studies[22,23-25] glaucoma in Benin City and its environs. These findings also corroborate with the reports of the Nigerian National Blindness and Visual Impairment Survey of 2005-2007 and in Western Nepal [26-39].

The line graphs depicting the trend in the 5 major etiological factors of low vision among the study participants-glaucoma, oculocutaneous albinism, degenerative myopia, maculopathy and retinitis pigmentosa were undulating with peaks in the years - 2014,2015,2017 and 2018 [Figure 4]. The ophthalmologist and the other Eye Care Team personnel should therefore be ready at all times to accommodate and treat all forms of low vision pathologies.

In this study, the preferred low vision aids during the period under review were telescope, spectacle magnifiers, hand-held magnifiers, standing magnifiers, contact lenses, photo-antireflective lenses and electronic magnifiers [Figure5]. This study compares well with the study of Ackuaku-Dogbe et al in Ghana, where majority of the participants preferred magnifiers as low vision devices for near and telescopes for distant vision with varying degrees of magnifications[30]. The Chi square trend analysis of the 5 most preferred low vision aids (telescope, spectacle magnifiers, hand-held magnifiers, standing magnifiers and contact lenses) among the study participants during the period of review was statistically significant p≤0.05 [Figure 6]. The trend in the frequency of preference of telescope had a steady step-wise increase except for a slight drop in 2015. Also, spectacle magnifier was increasingly demanded throughout the period under review except in 2016.

II. CONCLUSION

The trend of the utilization of low vision services in UPTH through a period of six years was undulating with improvement among rural dwellers and female folks. Glaucoma, oculocutaneous albinism, degenerative myopia, maculopathy and retinitis pigmentosa were the major etiological factors of low and the Chi Square trend analyses of their occurrences in our clinical practice were all statistically significant. Our Eye Care Service Systems should therefore be equipped and prepared to provide adequate low vision service to the populace.

III. FINANCIAL SUPPORT AND SPONSORSHIP
Nil

IV. CONFLICTS OF INTEREST:

There are no conflicts of interest.

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