

## **Bilateral Blindness: Prevalence and Their Utilization of Existing Eye Care Facilities in a Nigerian Rural Community**

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### **Abstract:**

**Background:** Blindness, which is potentially avoidable, is a serious public health problem globally. This study was carried out to determine prevalence of bilateral blindness and the utilization of existing eye care facilities by the bilaterally blind.

**Methods:** A randomized cross sectional community-based study. Participants were community members aged 5 years and above who were selected from 30 enumeration areas determined with EPI INFO V6 statistical software in line with standard practice. They had detailed ocular examinations and data were analyzed with SPSS.

**Results:** Eligible participants were 1,236 (Male: Female = 1:2). Age ranged 5-103 years (median age, 55 years). Prevalence of blindness was 4% (49/1236) for which Cataract (42.9%); Glaucoma (24.5%), Couching (10.2%) and Cornea opacity (8.2%) were the common causes. Most of those that were blind (57.1%) had never utilized eye care services available in the study area and lack of awareness was the reason in majority of them.

**Conclusions:** Blindness as a result of avoidable causes is high in this community. Despite this, the level of utilization of available eye care facilities is low and this is mainly as a result of lack of awareness. Eye health promotion campaign at the rural level is recommended.

**Keywords:** Awareness, Bilaterally blind, Eye health, Prevalence, Utilization.

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### **1. Introduction**

Blindness is a serious public health problem globally [1]. World Health Organization (WHO) defined blindness as visual acuity of less than 3/60 in the better eye with the best correction [2]. About 80% of the world's blindness is avoidable and most cases occur in developing countries [3]. Three main reasons for the high prevalence of visual impairment (low vision and blindness) are non-availability, non-accessibility and non-affordability of eye care services. However, there could still be low acceptance level despite availability of eye care facility due to negative attitudes of people toward the existing eye care facility. Negative attitude is a major impediment in the provision of healthcare, with research showing that such attitudes can have a direct impact on patients' well-being and the type of health care they receive [4].

Utilization of available eye care facility which is pivotal to achieving vision 2020 goal is influenced by the health seeking behavior such as traditional practices, beliefs, fatalistic attitudes towards blindness, fear of treatment, lack of faith in the intervention, and fear of surgery of the people living in the community [3]. Non utilization of eye care facility could lead to increase in prevalence of avoidable blinding conditions. Studies have documented a lower rate of eye care utilization in rural versus urban areas [5, 6], although majority of these avoidable blind people live in the rural community. For instance, Lewallen reported that most cataract blind live in rural areas while most ophthalmologists live in urban areas [7]. In Nigeria, the use of non-orthodox eye medication has become a common practice because of scarcity of ophthalmologists, which is further compounded by their uneven distribution, as many ophthalmologists live and practice only in cities [8].

For the magnitude of avoidable blindness to be reduced, persons must have positive attitude towards eye care facilities and providers. Therefore, understanding the attitudes and beliefs of these bilaterally blind people who happen to be greatly in need of eye care in the community is a fundamental step in addressing the negative attitudes towards the existing eye care facility which will in turn improve uptake of services thereby reducing the burden of the blindness. This study was thus conducted to determine the prevalence of bilateral blindness and utilization of the existing eye care facility in this rural community. No previous study has been carried out in this locality where there was no single licensed eye care giver until recently (2007) when a General Ophthalmologist was employed to work in a tertiary health care facility established 7 years earlier within the political constituency of the study area.

## II. Methods

This is a cross sectional study carried out with the aid of cluster sampling technique at Ido-Osi local government area of southwestern Nigeria. Sample size for the study was determined using EPI INFO V6 statistical software. Accepting a 95% confidence level, a blindness prevalence rate of 1.1% [9] actual population figure of 159,114 [10] for the communities in the Local Government Area, an acceptable error margin of 0.5% and a design effect of 1.2, a minimum sample size of 1,382 was calculated. This Local Government is composed of 13 rural communities with 449 enumeration areas. Using the 2006 population distribution table of the local government, thirty (30) Enumeration Areas (EA) were selected from the table systematically. Prior to data collection and with the assistance of local government area health officials, the geographical boundaries and midpoints of selected Enumeration Areas were determined and demarcated. Also, written consent for the survey was obtained from the Primary Health Care Coordinator of Ido-Osi Local Government Area and verbal consent from the Chief or Community head of the selected communities.

Based on bottle spinning from the pre-determined mid – point of each EA, 50 respondents aged 5 years and above were selected from each EA moving in a clockwise direction. All individuals aged 5 years and above were interviewed using a structured and pre-tested interview schedule. Parents or guardians of dependents among respondents gave information on their behalf. Information on age, sex, marital status, awareness of eye care facility, visit to the facility, reasons for not accessing the facility, past history of eye disease and self medication applied was obtained. Visual acuity was assessed using Snellen's or the illiterate 'E' charts depending on the literacy level of the individual. The chart was read by the respondents at six {6} meters away in an open space in normal daylight. Each eye was tested separately unaided and with pin hole, glasses or +10DS as required. All respondents were examined. Individuals with visual acuity less than 3/60 in the better eye were regarded as blind while those with visual acuity of less than 6/18 up to 3/60 in the better eye were considered visually impaired.

Using the pen – torch and a binocular loupe, each eye was examined separately for in-turned lashes (trichiasis), the cornea was inspected for cornea opacities and the lens examined for cataract. Other examination carried out included funduscopy using Keeler professional ophthalmoscope and tonometry using Perkins hand-held applanation tonometer after application of a drop of 0.5% tetracaine eye drops and 2% Fluorescein dye strip. Pupils were dilated using 5% phenylephrine or 1% tropicamide eye drops after tonometry to further study the posterior segments when necessary. Diagnosis and the cause of visual impairment were determined. Participants requiring further assessment and treatment were counseled and referred to the nearby tertiary eye clinic.

Data obtained was recorded into the computer using the Statistical Package for Social Sciences (SPSS) version 15. Analysis of data thus recorded was also achieved using the same software. Statistical significance was elicited using the Chi square and Fisher's exact at  $p < 0.05$ . Ethical clearance was obtained from the ethical committee of the Obafemi Awolowo University Teaching Hospitals Complex, Ile Ife.

## III. Results

Enumeration of 1236 eligible people was done. There were 417 (33.7%) males and 819 (66.3%) females with a male to female ratio of 1:2. The age range of the sample population was between 5 and 103 years with a mean age of  $51.44 \pm 21.95$  years. Most 751(60.8%) of the subjects were 50 years and above (Table 1).

### 3.1 Prevalence of Bilateral Blindness

Forty nine (4.0 %) of the participants were bilaterally blind and 110(8.9%) had visual impairment only. The major contributing causes for bilateral blindness were cataract (42.9%), Glaucoma (24.5%), couching which is the unorthodox method of removing cataract (10.2%) and corneal opacity (8.2%).

### 3.2 Utilization of Eye Care Facility

One hundred and seventy two participants (13.9%) had used the existing eye care centre previously while 1064 (86.1%) had never used it. More than half 28(57.1%) of those who were bilaterally blind had never utilized eye care services available in the study location. More males (17.3%) than females (12.2%) were found to utilize existing eye care facility. In the same vein, more married (15.3%) than unmarried (7.0%) people reported to have utilized eye care services. As shown in [Table 2], there was a stepwise increase in the rates of utilization of eye services with increasing age brackets ( $X^2=19.456, p=0.013$ ).

Odds of non utilization of eye care services was significantly higher with those who had no formal education compared with those who had formal education (OR 1.003, 95% CI=0.96-1.05,  $X^2=15.02, p=0.002$ ).

Majority (57.1%) of the bilaterally blind had not utilized the existing eye care facility, even though most of them had avoidable causes of blindness as shown in [Figure 2]. Almost half of the respondents

588(47.6%) gave a previous history of eye disease out of which only 137 (23.3%) people had utilized eye care services while majority 451(76.7%) resorted to alternative eye therapy ( $X^2=82.435, df=1, p=0.001$ ).

Reasons for non utilization of the eye care facility by the bilaterally blind were lack of awareness and cultural belief that eye disorders should not be treated in order to avoid blinding it [Table 3]. Greater proportion (82.0 %) of the people who had previously visited the existing eye care service either as patients or accompanying person claimed not to be satisfied with the eye care service delivery ( $p=0.001$ ).

#### **IV. Discussion**

A total of 1,236 persons were recruited into the study from the selected sample population in Ido- Osi Local Government Area of Ekiti State. Individuals aged 50 years and above constituted 60.8% of the sample population, which is above the 20% expected for such communities [11]. It is also higher than 33% and 44% seen in rural communities of Ogun [12] and Oyo [13] states respectively. The reason for this is not immediately clear.

The major contributing causes for bilateral blindness were cataract (42.9%), Glaucoma (24.5%), Couching (10.2%) and corneal opacity (8.2%). Among these, 44 (89.9%) were avoidable or preventable causes of blindness which is similar to 84.0% found in Nigeria National blindness survey. Cataract and its traditional treatment method called couching, accounted for a lion share of the causes of bilateral blindness. It is more worrisome that couching enjoyed favorable patronage by participants in this study despite the crude manner with which it is done and the plethora of complications associated with it. This unwholesome practice had also been reported across remote areas where there is lack of surgical facilities, particularly in West Africa, the Indian Sub-Continent and in China [14]. This practice has been described as a blinding menace which must be eliminated [15]. To achieve this, there is need to sustain education to both the practitioners and members of the community as well as extend affordable surgical facilities to these remote rural areas.

Every community has developed different means of preventing and managing diseases through its own understanding and belief. Early detection and timely treatment by eye-care providers are necessary to delay disease progression and prevent vision loss. An assessment of eye care service utilization, which is affected by eye care accessibility and individuals' health-seeking behavior among other factors, could be an indicator of effective coverage of a health care service. In this study, a history of eye care visit was considered a determinant of eye care service utilization. Results of this study revealed that over three quarters (86.1%) of the participants had never utilized the eye care facility. Despite the high prevalence of blindness (4.0%), more than half of bilaterally blind patients had never visited the existing eye care facility contrary to common expectation that the blind ought to seek for care. More than half of the causes of bilateral blindness in this study is avoidable and were needlessly blind as result of poor utilization of existing eye care facility. Lack of awareness followed by cultural belief that eye disorders should not be treated in order to avoid blinding it were the reasons given for not accessing and utilizing the eye care facility at their 'backyard'. This is a serious cause for worry since both utilization of eye care services and availability of ophthalmological services in the rural areas of the developing countries are pivotal to achieving vision 2020 goal of elimination of avoidable blindness [16].

Several studies concerning the utilization of eye care services and ophthalmic examinations have reported different rates depending on the geographical variation and the target population. Nirmalan and colleagues[17] reported a 64.5% 'no eye care' visit among a target population of rural Indians, while at the other end of the range, Wang et al reported an impressive 99% eye care service coverage in an older Australian population [18]. We observed an increasing level of eye care utilization with increasing age from 40years upward this may be due to the fact that aging is associated with an increased rate of visual impairment and ophthalmic conditions, a considerable percentage of people are motivated to seek eye care by the factor of need. However, this is contrary to some other studies that found decreasing rates with an increasing age [6, 17, 19].

The greater eye care seeking behaviour found with those who had formal education might be attributable to their greater knowledge, higher socioeconomic class and more affordability.

The reports on the effect of gender on eye care utilization have been inconsistent. Glendenin et al [20] reported equal utilization among gender in an Irish rural population, and Resnikoff et al [11] in a report on behalf of World Health Organization averred that men seek eye care more than women while Lewallen et al reported that women are more likely to seek eye care than men [7]. The relationship between gender and utilization of eye care services in our study is in agreement with reports of Resnikoff et al. Despite a 4% prevalence of bilateral blindness in the study population, more than half of the blind never utilized eye care service. Low level of awareness was the major reason for non-utilization of eye care service. However, other studies [18] have identified poor transport infrastructure, lack of funds to pay for transport, unfamiliar or intimidating hospital environment as reasons for poor utilisation of existing facility. There is therefore need to embark on serious and aggressive awareness campaign by all eye care providers in order to change this negative attitude towards the existing facility.

In conclusion, prevalence of bilateral blindness is high in these rural communities and is majorly caused by avoidable factors. Screening and surgical camps in the village should be carried out regularly in addition to bussing in of some patients to the existing facility. Also, health care workers at the village level must be made to be aware of existing services for prompt referral. The significant proportion of the elderly, visually impaired and the blind that have never had an eye care visit or utilized eye care services must be attended to by engaging in eye health promotion campaign which may eventually correct these fatalistic attitudes towards existing eye care facility in the community.

#### **V. Conflict of interest**

The authors have no conflict of interest.

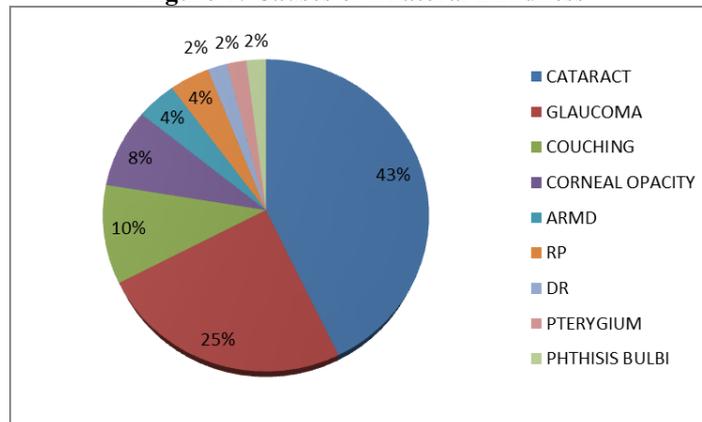
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**Table 1: Age and Sex Distribution**

Age group(years)	Male n(%)	Female n (%)	Total n(%)
0-9	27 (65.9)	14( 34.1)	41 ( 3.3)
10-19	54 ( 49.5)	55 (50.5)	109 (8.8)
20-29	36 (45.0)	44 ( 55.0)	80 (6.5)
30-39	21 (29.6)	50 (70.4)	71(5.7)
40-49	54 (29.4)	130 ( 70.6)	184 (14.9)
50-59	68( 35.2 )	125 ( 64.8)	193( 15.6)
60-69	57(23.5)	186 (76.5)	243 (19.7)
70+	100(31.7)	215( 68.3)	315 (25.5)
TOTAL	417(33.7)	819( 66.3)	1236(100.0)

**Figure 1: Causes of Bilateral Blindness**



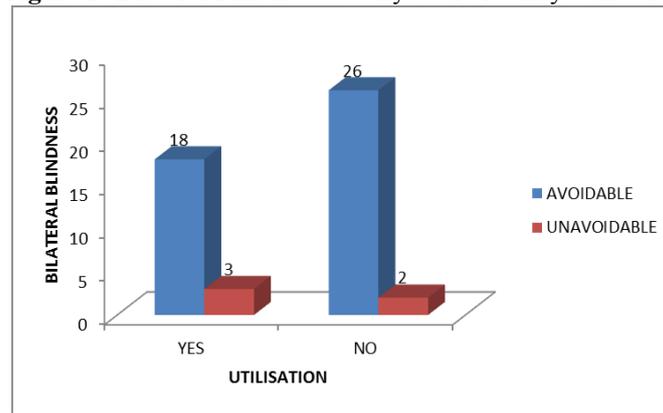
**KEY:** RP-Retinitis Pigmentosa DR-Diabetic Retinopathy, ARMD-Age related macular regeneration

**Table 2: Age Group, Category of Vision, Gender, Marital Status, Educational Status and Utilisation**

Group	Utilisation			P Value
	Yes n(%)	No. n(%)	Total n(%)	
<b>Age Group(years)</b>				
<20	10(6.0)	156(94.0)	166(13.4)	0.001
21-40	18(9.0)	181(91.0)	199(16.1)	
>40	144(16.5)	727(83.5)	871(70.5)	
<b>Total</b>	172(13.9)	1064(86.1)	1236(100.0)	
<b>Category of Vision</b>				
≥6/18	133(12.3)	944(87.7)	1077(87.1)	0.001
<6/18-6/60	18(16.4)	92(83.6)	110(8.9)	
<3/60-NPL	21(42.9)	28(57.1)	49(4.0)	
<b>Total</b>	172(13.9)	1064(86.1)	1236(100.0)	
<b>Gender</b>				
Male	72(17.3)	345(82.7)	417(33.7)	0.002
Female	100(12.2)	719(87.8)	819(66.3)	
<b>Total</b>	172(13.9)	1064(86.1)	1236(100.0)	
<b>Marital Status</b>				
Single	14(7.0)	186(93.0)	200(16.2)	0.015
Married	158(15.3)	878(84.7)	1036(83.8)	
<b>Total</b>	172(13.9)	1064(86.1)	1236(100.0)	
<b>Educational Status</b>				
None	67(13.8)	420(86.2)	487(39.4)	0.002
Primary	38(10.8)	313(89.2)	351(28.4)	
Secondary	30(12.6)	209(87.4)	239(19.3)	
Tertiary	37(23.3)	122(76.7)	159(12.9)	
<b>Total</b>	172(13.9)	1064(86.1)	1236(100.0)	

NPL-no light perception

**Figure 2:** Bilateral Blindness Vs. Eye Care Facility Utilisation



**Table 3:** Reasons for Non Utilisation of Eye Care Services among People with Bilateral Blindness

Reasons	Avoidable Blindness		Total n (%)
	Yes n (%)	No n (%)	
No Money	1(100.0)	0(0)	1(3.6)
No Escort	4(80.0)	1(20)	5(17.8)
Not Aware	14 (100.0)	0(0)	14(50.0)
Belief	7(87.5)	1(12.5)	8(28.6)
Total	26(92.9)	2(7.1)	28(100.0)