

# Accessibility and Barriers to Uptake of Ophthalmic Services among Rural Communities in the Upper Denkyira West District, Ghana

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## Abstract

Vision impairment and blindness remain a challenge in developing countries, especially in rural communities. Notwithstanding, VISION 2020 global initiative seeks to eliminate avoidable blindness by 2020. This community-based cross-sectional study aimed at determining the accessibility of ophthalmic services and barriers to its utilization in rural communities in the Upper Denkyira West District, Ghana. One-hundred and seventy participants from 5 randomly chosen rural communities in the district were included. Participants were interviewed using a structured questionnaire. Socio-demographic information, information regarding accessibility, utilization, and barriers to eye care services were obtained. Descriptive statistics were carried out using SPSS version 23. The Chi-squared test was employed to determine associations. P-values less than 0.05 at a confidence interval of 95% were considered significant. Only 21.8% of participants had had eye examination within the past 3 years, with over half of the examinations undertaken at screening grounds and health centres. Significant associations were found between ophthalmic services utilization and increasing age [ $p = 0.004$ ], female gender [ $p = 0.027$ ] and those who had a past history of eye problem(s) [ $p = 0.001$ ]. The study found gross inadequate utilization of ophthalmic services mainly due to unavailable ophthalmic services in the rural district. Public health education and eye care interventions should prioritize and target rural populations.

## Key Messages:

This study found gross inadequate utilization of ophthalmic services mainly due to unavailable ophthalmic services in the rural district. Rural dwellers were thus compelled to resort to harmful eye care practices. Public health education and eye care interventions should prioritize and target rural populations.

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## Introduction

Several studies have reported blindness and vision impairment as major health problems in developing nations [1-4]. According to the World Health Organization (WHO), 90% of all persons with visual impairment live in developing nations [1]. The problem is more alarming among rural populations [5-7]. Amponsa-Achiano *et al.* [2] found that 90.3% of participants of an outreach clinic in a rural Ghanaian district had at least a disorder in one eye. Also, the Ghana National Blindness and Visual Impairment Study by the International Agency for the Prevention of Blindness (IAPB) showed a 0.79% prevalence of blindness in rural areas of Ghana relative to 0.67% in urban areas [3]. Although rural cocoa farmers in Ghana were reported to have very poor perception about their vision, they failed to utilize available ophthalmic services [4]. Eighty-five percent of these rural farmers reported they had poor or very poor vision, yet only 31.9% on Snellen visual acuity examination were found to have poor vision (6/24 - 6/60) or very poor vision ( $\leq 3/60$ ). The relatively higher burden of eye and vision disorders in rural communities poses a major challenge to the attainment of Vision 2020 goals [8]. Chandrashekhar *et al.* [9] found that state-owned hospitals in India which had eye care facilities were too distant away from the rural villages, a major reason why many rural inhabitants avoided or underutilized ophthalmic services. Similarly, Dhaliwal and Gupta [10] attributed the poor usage of ophthalmic services among people with cataract in rural India to lack of affordable transport. Inadequate eye care personnel, inadequate eye care facilities, and unaffordable ophthalmic services have been described as major setbacks in preventing and treating avoidable causes of blindness in Africa [5-7,11,12]. Ntsoane and Oduntan [13] found that most of the hospitals and health care centres with eye care facilities were situated in urban centres. According to them, this was a notable hindrance to universal ophthalmic services utilization. Moreover, the unequal delivery of ophthalmic services among rural communities and urban centres has been suggested as key contributing factor to the overwhelming burden of blindness and visual impairment in rural regions [13]. Ashaye *et al.* [14] reported that rural dwellers in Western Nigeria were underserved because a chunk of ophthalmic services in

Western Nigeria was situated in urban areas. Consequently, inhabitants in these rural communities who had preventable and remediable ocular disorders were left unattended to. According to Silva *et al.* [15], the number of ophthalmic practitioners per million-population is nine times more in the richest countries than the poorest countries, an evidence that availability of ophthalmic services varies between countries in different regions of the world. By considering a nation, availability of ophthalmic services could differ from one region to another, districts and even between communities. For instance, the reported optometrist to population ratio in Ghana was 1:377,661 and that of ophthalmologist was 1:324,552, many of whom practiced in cities leaving rural dwellers underserved [11].

Many rural inhabitants are thus compelled to resort to alternate sources of eye care including herbal preparations and traditional practices which are potentially harmful [16]. Another reported primary hindrance to ophthalmic services in rural regions is the poor road network linking rural communities to health centres [15,17].

Robin *et al.* [18] also reported poverty as a major drawback to the utilization of ophthalmic services in both developing and developed countries. Low economic activity among rural inhabitants renders them incapable of paying for the cost of health services in general. Disorders which could be remedied at the onset are left to deteriorate [5].

Several studies have also indicated under usage of ophthalmic services in rural areas even when they are available and accessible [19-21]. Ntsoane and Oduntan [13] identified socio-demographic characteristics, lack of knowledge on blinding eye care conditions, lack of felt need and socio-cultural beliefs as causes of the poor usage of existing ophthalmic services.

The tendency of resorting to alternate ophthalmic practices in the midst of many ocular conditions coupled with the lack of proper ophthalmic services is very high [16].

While poor utilization of appropriate ophthalmic services contribute to high prevalence of visual impairment and blindness, studies on accessibility and usage of ophthalmic services have not focused much on

rural areas in Ghana [11,22–24]

This study seeks to determine the accessibility, utilization and barriers to uptake of ophthalmic services among rural communities in the Upper Denkyira West District, Ghana.

## Methods

### *Study Area and Design*

This community-based cross-sectional descriptive survey was conducted in the Upper Denkyira West District, Ghana from December 2017 to March 2018. With a total population of 60,054, the district is entirely rural [25]. The district was served by 12 Community Health Centres and 4 private-owned clinics. None of the healthcare facilities had an eye unit.

### *Participant Selection and Procedure*

Adult population 18 years and older who had lived in the district for not less than 3 years and consented to partake in the study were included. A total of 170 participants were included in this study. The Epi-Info™ software version 7 (Centre for Disease Control, Atlanta, Georgia, USA) was used to calculate the sample size using the following parameters: the target population (18 years and older) of 28,684 [25]; expected frequency of 32% [26]; 7% confidence limits and 95% confidence interval.

Five communities were randomly selected. This was chosen on the basis of previous district-wide studies [26,27]. All communities (list obtained from the district assembly) were assigned a number label. Each number was written on equally sized pieces of paper and folded up into a bowl. The 5 communities: Breman-Brofoyedu, Domenasi, Besease, Maudaso, and Nkotumso were then drawn one after the other from the bowl.

Thirty-four participants each from the 5 randomly selected communities were chosen using a systematic random sampling. This was done by selecting every second person who reported to the outreach grounds in response to announcements that were made earlier in the communities.

Participants were interviewed using a structured questionnaire. Socio-demographic information, information regarding accessibility, utilization, and barriers to eye care services were obtained.

## Data Analysis

Data collected were analysed using the Statistical Package for Social Science (SPSS) version 23 (SPSS Inc, Chicago, IL, USA). Descriptive statistics were carried out and the Chi-squared test was employed to determine associations. P-values less than 0.05 at a confidence interval of 95% were considered significant.

### *Ethical Consideration*

The study was conducted in accordance with the tenets of the Declaration of Helsinki. The district authorities and authorities of the various communities were informed of the survey and their permission subsequently obtained. Informed consents were also gotten from study participants. Sufficient information was given to each participant to decide on partaking in the study or not. Participants' anonymity and confidentiality were also kept.

## Results

### *Socio-Demographic Characteristics*

With a 100% response rate, participants' mean age ( $\pm$ SD) was 46.86 ( $\pm$  20.03) years; range 18- 84 years. Table 1 summarizes the socio-demographic characteristics of participants.

Participants' Last Eye Examination (Figure 1). Access to Ophthalmic Services. (Table 2).

Participants past ocular problems and treatments sought (Table 3).

Influence of Socio-demographic Factors on Ophthalmic Service Utilization (Table 4).

### *Barriers to Ophthalmic Services Utilization*

A total of 563 responses from 169 (99.4%) participants were obtained, giving a mean response of 3 per person (Table 5).

## Discussion

While only 21.8% of participants in this study had had their eyes examined within the past 3 years, more than half (54.1%) had never received an eye examination. Ebeigbe et al. [26] found a higher proportion (68%) of older persons (40-75 years) in rural Nigeria who had never received any eye examination. Also, Odutan and Raliavhegwa [28] in rural South Africa found 61% of a rural district populace who had never

Table 1. Socio-demographic characteristics of participants

Variable	N (%)
Age group (years)	
18 – 28	46 (27.1)
29 – 39	20 (11.8)
40 – 50	26 (15.3)
51 – 61	33 (19.4)
62 – 72	25 (14.7)
>72	20 (11.8)
Gender	
Male	81 (47.6)
Female	89 (52.4)
Highest educational level	
Never went to school	33 (19.4)
Elementary	92 (54.1)
Secondary	35 (20.6)
Tertiary	10 (5.9)
Employment status	
Employed	92 (54.1)
Unemployed	73 (42.9)
Retired	5 (2.9)
Ethnicity	
Akan	139 (81.8)
Ga-Adangbe	1 (0.6)
Ewes	7 (4.1)
Northern Tribe	23 (13.5)
Religion	
Christianity	159 (93.5)
Islam	8 (4.7)
Traditional	2(1.8)

N, frequency; %, percentage

Table 2. Access to ophthalmic services among participants who had received previous eye examination.

	Last Eye Examination		
	Less than 3 years ago N (%)	More than 3 years ago N (%)	Total (%)
Place of last eye exam			
Eye facility	21 (26.9)	14 (18.0)	35 (44.9)
Health centre	2 (2.6)	9 (11.5)	11 (14.1)
Outreach grounds	14 (18.0)	18 (23.1)	32 (41.0)
Total	37 (47.4)	41 (52.6)	78 (100.0)
Distance travelled to eye facility			
Less than 5 km	2 (5.7)	1 (2.9)	3 (8.6)
5 – 8 km	4 (11.4)	3 (8.6)	7 (20.0)
More than 8 km	15 (42.9)	10 (28.6)	25 (71.4)
Total	21 (60.0)	14 (40.0)	35 (100.0)
Time taken			
Less than 30 minutes	4 (11.4)	2 (5.7)	6 (17.1)
30 minutes to 1 hour	5 (14.3)	4 (11.4)	9 (25.7)
More than an hour	12 (34.3)	8 (22.9)	20 (57.1)
Total	21 (60.0)	14 (40.0)	35 (100.0)
Means of transport			
Foot	2 (5.7)	2 (5.7)	4 (11.4)
Public transport	18 (51.4)	11 (31.4)	29 (82.9)
Private transport	1 (2.9)	1 (2.9)	2 (5.7)
Total	21 (60.0)	14 (40.0)	35 (100.0)

N, frequency; %, percentage

Table 3. Participants' past ocular problems and treatments sought

	Past ocular history					Total N (%)
	Eye injury N (%)	Red eyes N (%)	Vision problems N (%)	Red eyes And Vision problems N (%)	Eye injury and Vision problems N (%)	
History of eye problem						
Yes	32(18.8)	30(17.6)	68 (40.0)	6 (3.5)	5 (2.9)	141(82.9)
No						29 (17.1)
Treatment						
Treated at an eye facility	9 (5.3)	3 (1.8)	17 (10.0)	1 (0.6)	1 (0.6)	31(18.2)
Used an eye drop obtained from a chemical shop	13 (7.6)	23(13.5)	16 (9.4)	5 (2.9)	3 (1.8)	60 (35.3)
Used herbal preparation	5 (2.9)	0 (0.0)	8 (4.7)	0 (0.0)	1 (0.6)	14 (8.2)
No treatment	5 (2.9)	4 (2.4)	27 (15.9)	0 (0.0)	0 (0.0)	36 (21.2)

N, frequency; %, percentage

Table 4. Utilization of ophthalmic services by socio-demographic characteristics

	Ever Had An Eye Exam?		p-value
	Yes N (%)	No N (%)	
Age (years)			
18-28	17 (10.0)	29 (17.1)	0.004*
29-39	4 (2.4)	16 (9.4)	
40-50	16 (9.4)	10 (5.9)	
51-61	13 (7.6)	20 (11.8)	
62-72	13 (7.6)	12 (7.1)	
>72	15 (8.8)	5 (2.9)	
Gender			
Male	30 (17.6)	51 (30.0)	0.027*
Female	48 (28.2)	41 (24.1)	
Highest educational level			
Never went to school	20 (11.8)	13 (7.6)	0.179
Elementary	41 (24)	51 (30.0)	
Secondary	12 (7.1)	23 (13.5)	
Tertiary	5 (2.9)	5 (2.9)	
Employment status			
Employed	40 (23.5)	52 (30.6)	0.326
Unemployed	37 (21.8)	36 (21.2)	
Retired	1 (0.6)	4 (2.4)	
Ethnicity			
Akan	63 (37.)	76 (44.7)	0.078
Ga-Adangme	1 (0.6)	0	
Ewes	6 (3.5)	1 (0.6)	
Northern Tribe	8 (4.7)	15 (8.8)	
Religion			
Christianity	75 (44.1)	84 (49.4)	0.427
Islam	2 (1.2)	6 (3.5)	
Traditional	1 (0.6)	2 (1.2)	
History of eye problem			
Yes	74 (43.5)	67 (39.4)	0.001*
No	4 (2.4)	14.7)	

N, frequency; %, percentage; \*p< 0.05, variables with significant association with use of ophthalmic services.

Table 5. Barriers to utilization of ophthalmic services among participants

Barriers	N (%)
There are no eye clinics around	99 (17.6)
Nearest eye clinic too far away	93 (16.5)
Can't afford the cost of services	79 (14.0)
My eye problems are not too serious	74 (13.1)
Challenges with transportation	63 (11.2)
Do not have health insurance	51 (9.1)
Do not see the need to check my eyes because I have not had an eye problem	40 (7.1)
Not old enough (18-28 years) to be having eye problems	33 (5.9)
Prefer herbal or traditional treatment	24 (4.3)
My eye problems are of a spiritual cause than medical	7 (1.2)
Total	563 (100.0)

N, frequency; %, percentage

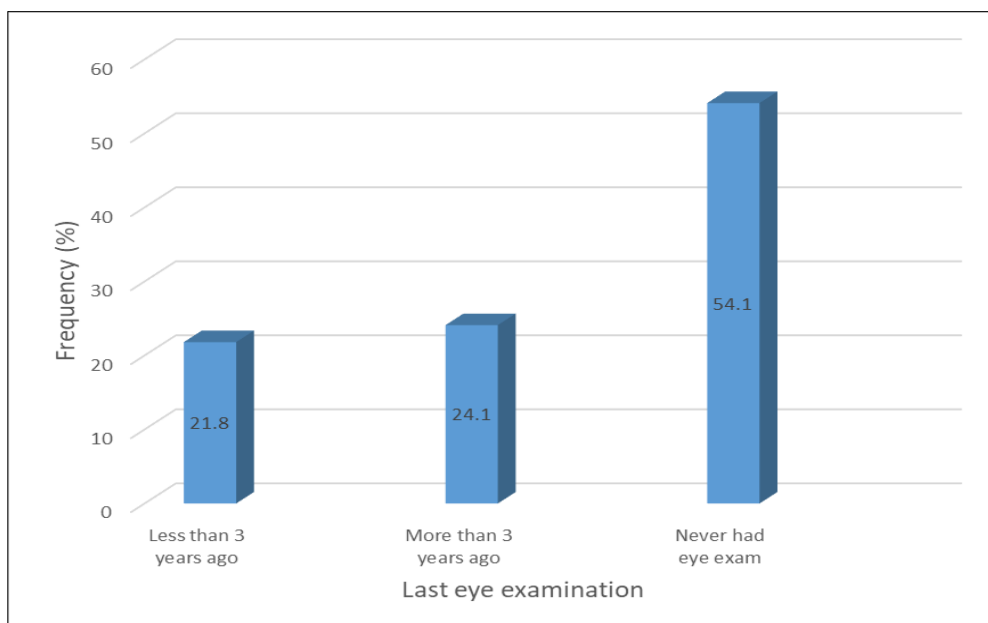


Figure 1. Participants' Last eye examination

had their eyes examined. These studies however employed larger sample sizes which might have accounted for the relatively large percentages of non-usage of ophthalmic services.

Although there are minor differences in reported levels of ophthalmic services utilization in rural areas, many are consistent indicators of inadequate utilization [11]. Coincidentally, Ocansey [24] found the same proportion (45.9%) of elderly participants (40 years and above) ever utilizing ophthalmic services in an urban Ghanaian region. While this was unexpected, it could possibly be because of reported barriers to uptake of available, accessible and affordable ophthalmic services [13]. This seems to better explain the coincidence as 45.2% of participants in a Ghanaian urban community who had never checked their eyes were of the view that their eye problems were not bothersome [23].

In this study (table 4), about 82.9% of the participants indicated they had ever experienced at least one form of eye problem. About 40% indicated they had problems with vision. Yet, 15.9% of those who reported reduced vision received no treatment. In a Nigerian rural study, Ebeigbe et al. [26] found that rural dwellers do not see reduced vision as a problem until they can no longer perform their visual task. Again, this study found that non-prescription drops from chemical shops were used by 13.5% of the participants to manage red eye conditions. Herbal and/or traditional preparations were also common ways of treating eye injuries and red eyes. This was similar to the findings of Oveneri-Ogbomo et al. [29] on ophthalmic services utilization in shanty areas of the Accra Metropolis (Ghana) where study participants between 18 and 80 years were found to use sea water and breast milk in managing some eye disorders. Again, the report of an urban study in Ghana was no different [23]. Ntim-Amponsah et al. [16] found no significant difference ( $p=0.78$ ) between patronage of alternate ophthalmic services and the regular ophthalmic services by participants of Akuapim South District, Ghana, revealing that easy access to alternate ophthalmic services and longer waiting hours at hospitals were the compelling factors. Of the 45.9% participants who had had an eye examination, there were more females (28.2%) than males. A significant association between ophthalmic services utilization and

gender was thus found in this study [ $\chi^2 = 4.875$ ;  $p = 0.027$ ]. Several studies also found significant associations between gender and ophthalmic services utilization affirming the fact that women seek more ophthalmic services than their counterpart [17,26,30–33]. Since older people are predisposed to many eye conditions, the relatively longer lifespan of women may be the reason why women access more eye care than men.

Also in this study, a statistically significant association [ $\chi^2 = 17.204$ ;  $p = 0.004$ ] was found between ophthalmic services utilization and increasing age. Kovai et al. [19], Robin et al. [18], Schaumberg et al. [32] have all reported positive associations. This could generally be due to the increased susceptibility to ocular problems as one ages. With the gradual decrease in vision, older people are more expected to seek ophthalmic care than young people who perceive eye problems as a disease of old age.

Although 74.4% of participants who have had eye examination had obtained at least elementary education, there was no significant association [ $\chi^2 = 4.909$ ;  $p = 0.179$ ] between highest educational level and ophthalmic services utilization in this study. This was contrary to Fotouli et al. [34] who reported a significant association between ophthalmic services utilization and highest educational level, asserting one was more expected to seek ophthalmic care when he or she is much educated. Fatouli et al. [34] believed that educated people seek ophthalmic services because they may have a better knowledge of their condition and also understand the implications of not seeking attention to their eye problems. Also, educated people mostly belong to the higher socioeconomic class, thus are more capable of bearing the total cost of ophthalmic services.

Again in this study, no significant associations were found for employment status [ $\chi^2 = 2.241$ ;  $p = 0.326$ ], ethnicity [ $\chi^2 (2) = 6.811$ ;  $p = 0.078$ ], religion [ $\chi^2 = 1.701$ ;  $p = 0.427$ ], and ophthalmic services utilization.

A statistically significant association was nonetheless found in this study between those who had a past history of eye problem(s) and ophthalmic services utilization [ $\chi^2 = 14.500$ ;  $p = 0.001$ ]. In rural Nigeria, Ebeigbe et al. [26] also found that people who had no or



minor eye problems scarcely utilized ophthalmic services. This explains why people who found their eye problems unbearable more probable to utilize ophthalmic services as there was a need or reason to do so.

About 44.9% (table 2) of participants in this study who had had their eyes examined at an eye care facility did so outside the district. The remaining majority received their examination from outreach grounds and health centres. None of the clinics nor the community health centres had an eye care professional or an ophthalmic unit. This implies that non-eye care professionals attended to patients who presented with eye problems. For those who were seen at outreach grounds, they had to wait with their problems until luck shone on them for mobile eye clinics to come to their aid. This may be risky in cases of ocular emergencies. The few who travelled to eye care facilities travelled a distance of more than 8 km taking more than an hour (Table 2). Chatora and Tumusine<sup>[35]</sup> recommended that an individual accessing primary health care should not travel over 8 km distance and over 60 minutes time. It was in light of the poor access to primary health care that called for the Declaration of Alma-Ata in 1978 stating that access to primary eye care is fundamental human right.

The lack of any eye care facility in the Upper Denkyira West District was the major hindrance to eye care as 17.6% of all responses to barriers to eye care utilization indicated "there are no eye clinics around" (Table 5). Buchanan and Horwitz<sup>[36]</sup> also found unavailable eye care facilities and limited eye care personnel as the major barrier to ophthalmic services in rural Jamaica. According to Buchanan and Horwitz, the unavailable services accounted for more than 43% of the rural Jamaican populace who had never examined their eyes. Residents in the Upper Denkyira West District had to travel outside the district to seek eye care which could be inconvenient to make people consider their eye problems not too serious to demand intervention. Unaffordable cost of ophthalmic services, challenges with transportation, beliefs that eye problems were of a spiritual cause than medical, preference to herbal and/or traditional treatments were also reported barriers to ophthalmic services utilization in this study.

Also in this study, about 5.9% of indicated barriers to ophthalmic services utilization was the fact that they were not old enough (18 and 28 years) to be having eye problems.

Moreover, about 13.3% of the participants in this study indicated their eye problems were not too serious that needed attention. Red eyes and itching were considered by participants as "normal" in that, they could easily be remedied with over the counter eye drops.

## Conclusions

This study found gross inadequate utilization of ophthalmic services mainly due to unavailable ophthalmic services in the rural district. Some rural dwellers were thus compelled to make use of potentially harmful eye care practices such as the use of non-prescribed eye drops and herbal preparations.

Notwithstanding, older persons, females, and participants who had a past history of eye problem(s) significantly utilized more ophthalmic services.

## Recommendation

Public health education and eye care interventions should prioritize and target rural populations. These interventions could yield positive outcomes as many visual impairing and blinding eye conditions are avoidable.

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