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Prevalence and associated factors of visual impairment in two rural communities in Ghana

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Background: Limited information on the burden of visual impairment (VI) impedes decision-making in terms of eye health provision.

Aim: This study assessed the prevalence, causes and associated factors of VI in rural communities in Ghana.

Setting: The study site included two rural communities of the Birim Central Municipality (BCM) in the Eastern Region of Ghana.

Methods: A cross-sectional study was conducted using a multi-stage sampling technique in two randomly selected villages within the Birim Central Municipality (BCM). Participants were recruited through systematic household sampling. Socio-demographic data were collected using interviewer-administered questionnaires. Comprehensive eye examinations included visual acuity testing, anterior and posterior segment evaluation, auto-refraction and tonometry. Visual impairment was classified according to the International Classification of Diseases (ICD-11).

Results: The overall prevalence of VI was 30.1% (95% confidence interval [CI]: 25.80–34.70). Cataracts were the leading cause, accounting for 39–40.28% of VI per eye**,** 52.46% of bilateral VI and 68.75% of blindness**.** Uncorrected refractive error was the primary cause of unilateral VI (48.57%). Significant risk factors for VI included age ($P < 0.001$), marital status ($P = 0.02$) and occupation ($P = 0.01$). Participants aged 36–59 years (adjusted odds ratio [AOR] 4.93, 95% CI 1.14–21.31) and 60+ years (AOR 11.29, 95% CI 2.41–52.85) had higher odds of VI. Civil servants and traders had 20% and 28% lower odds of VI compared to students.

Conclusion: Visual impairment prevalence in rural Ghana is high, with cataracts and uncorrected refractive error as the primary causes, both of which are preventable or treatable. Establishing community vision centres could enhance early detection and management, reducing the VI burden in underserved areas.

Contribution: This study has shed light on the burden of VI in rural communities in Ghana; the main drivers of the VI and risk factors. Additionally, the study has called attention to making eye care accessible and affordable for rural dwellers in Ghana.

Keywords: visual impairment; blindness; prevalence; associated factors; visual acuity; uncorrected refractive error; cataracts; preventable.

Introduction

Visual impairment (VI) enjoys the centre of attention within the public health domain, manifesting as an escalating concern with growing instances.[1] Globally, it is estimated that about 2.2 billion individuals are visually impaired, and a substantial proportion, approximately 50%, could have been averted through preventive measures.[2,3,4] Notably, empirical evidence establishes that the occurrence of blindness in developing nations surpasses that of the developed counterparts, and it is worth noting that the prevalence of VI in economically disadvantaged countries is four times higher when compared to high-income nations.[2]

The prevalence of VI varies across geographical locations. In the Americas, the prevalence of VI ranged between 1.3% and 12.5%, which is lower compared to other continents, with a significant proportion of cases being preventable.[5,6,7,8] In Africa, the reported prevalence of VI among the general population ranges between 3% and 29.4%.[9,10,11,12,13,14] This variation is influenced by the availability and affordability of eye care services and the level of eye care literacy.[2] According to the Ghana Blindness and VI Study conducted in 2015, the overall

prevalence of VI in Ghana was reported as 1.46%, with 0.74% of the Ghanaian population being classified as blind.[15]

Visual impairment negatively impacts both the individual and the community in various ways. This ranges from physical and mental to academic and activities of daily living. For children who experience early onset of VI, developmental difficulties such as delayed motor, emotional, language, cognitive and social development have been found.[16] Additionally, school-aged children with VI will likely experience reduced educational achievement compared to their peers.[9] In adults, the lack of independence associated with VI can have a detrimental effect on an individual's regular work activities, which leads to poverty and depression.[17] The risk of mortality among people with VI is higher because of the reduced capacity to perceive environmental dangers, thereby increasing the vulnerability of visually impaired individuals to potential risks.[16,17] Visual impairment poses a significant global economic challenge, with an estimated annual loss of about US$411bn in global productivity when adjusted for purchasing power parity.[18] According to a 2020 World Vision report, the yearly worldwide costs of productivity losses because of VI from uncorrected myopia and presbyopia were reported to be 244bn and 25.4bn dollars, respectively.[19]

In Ghana, the rural population accounts for approxmately 41% of the total population. According to the latest Population and Housing Census (PHC, 2021), it is estimated that 13,908,804 people live in rural areas.[20,21] Cocoa farming is the primary source of employment among small households in rural areas.[22] Despite efforts by the Ghana Health Service over the years to improve healthcare delivery, access to healthcare in rural Ghana is still lagging because of several factors, including inadequate health infrastructure, poverty, insufficiently trained health personnel and lack of basic healthcare equipment that hamper access to healthcare delivery in rural areas.[23] Other barriers to healthcare delivery in rural Ghana include negative societal norms about hospitals, lack of health insurance and long distances to access health facilities.[23,24,25] The situation regarding eye care delivery in rural Ghana is particularly dire. Ofosu et al.[26] reported that eye care provision in Ghana is through District, Regional and Tertiary hospitals, with a few other private hospitals located in the bigger urban cities. Consequently, it can be hypothesised that the burden of VI profoundly affects the rate of economic growth of Ghana, as well as people's quality of life, especially in rural areas where agriculture is the primary source of employment. However, the prevalence of VI among the general population in rural communities remains unknown and possibly underestimated because of scarce data and research publications related to the prevalence of VI among rural Ghanaian communities.

In a recent study, Boadi-Kusi et al.[22] found that the prevalence of moderate, severe VI and blindness among cocoa farmers in rural Ghana was 13.9%, 3.5% and 5.3%, respectively. The Eastern Region of Ghana is generally considered underdeveloped and rural because of limited access to healthcare and lower socio-economic standards.[27] Additionally, there is limited information on eye health and the burden of VI in this region. Furthermore, there is a growing concern about the inequitable distribution of eye care professionals in Ghana, with over 50% of the eye care workforce concentrated in cities, contributing to the high prevalence of VI in rural communities.[15,28] These present a severe challenge in decision-making regarding the provision of eye care services to rural communities in the region, especially considering both a newly established eye clinic and associated interventions seeking to address the burden of VI in the area and in Ghana.

This research aimed to determine the prevalence and causes of VI in the eastern region of Ghana. The findings could aid as the foundation for initiating a sustainable eye care programme in rural communities in the Eastern Region of Ghana.

Research methods and design

Study design, area and population

This quantitative, cross-sectional analytical study recruited 402 participants from two selected rural communities of the Birim Central Municipality (BCM) in the Eastern Region of Ghana from August 2023 to November 2023. These rural communities were Akim Aboabo and Oda-Nkwanta, which, according to the national population data, have a population of 7257 and 4936, respectively, adding up to a target population 12 193. The study employed multi-stage sampling, where the BCM was conveniently selected out of the 21 districts within the Eastern region of Ghana. All 24 rural communities within BCM were arranged alphabetically using their names. A simple random sampling technique was used to select the two rural communities for the study. Within the selected rural communities, households were thereafter systematically selected. All households in Ghana have unique house numbers. As such, houses with even numbers were selected for inclusion in this study. After identifying houses with even house numbers, the researcher then selected every other house with an even house number. Participants for the study were recruited from selected households. This recruitment was conducted a week before the data collection. A pilot study involving six participants (three males and three females, consisting of two children and four adults) was conducted to assess the practicality and viability of the study design, techniques and data collection sheets, with participants drawn equally from the two rural communities. The pilot study data were excluded from the main study; however, the pilot helped us to categorise participants' ages into groups to facilitate analysis.

Definitions

The study classified VI into different categories according to the World Health Organization International Classification of Diseases 11th Revision (WHO ICD-11).[29] No VI was defined as presenting distance visual acuity in the better eye

equal to or better than 6/12 (20/40, 5/10, 0.3), corresponding to category 0 (ICH-11 QA00.62). Mild VI referred to presenting distance visual acuity in the better eye worse than 6/12 (20/40, 5/10, 0.3) but equal to or better than 6/18 (20/70, 3/10, 0.5), corresponding to category 1 (ICH-11 9D90.1). Moderate VI was defined as presenting distance visual acuity in the better eye worse than 6/18 (20/70, 3/10, 0.5) but equal to or better than 6/60 (20/200, 1/10, 1.0), corresponding to category 2 (ICH-11 9D90.2). Severe VI was defined as presenting distance visual acuity in the better eye worse than 6/60 (20/200, 1/10, 1.0) but equal to or better than 3/60 (20/400, 1/20, 1.3), corresponding to category 3 (ICH-11 9D90.3). Blindness corresponding to categories 4, 5 and 6 in the ICH-11 9D90 categorisation was combined and termed blindness. Thus, the present study defined blindness as presenting distance visual acuity in the better eye worse than 3/60. Near VI was defined as presenting near visual acuity worse than N6 or M0.8 at 40 cm, paralleling category 7 (ICH-11 9D90.7). Refractive error was defined as a spherical error equal to or greater than ±0.50D and a cylinder error equal to or greater than -0.50D.[30]

Data collection and examination procedures

The data sheet contained information relating to socio-demographic, socio-economic and ocular examination. Oculo-visual examinations were conducted by using Logarithm of Minimum Angle of Resolution (LogMAR) and Near (N-Chart) charts, pinhole occluder, pen torch, Nidek Ark-1 autorefractor, slit-lamp biomicroscope, non-contact tonometer, indirect ophthalmoscope and +20D biconvex, aspheric magnifying lens. All the instruments were calibrated before each procedure was conducted. The research team comprised trained ophthalmic nurses, optometrists and an ophthalmologist. After obtaining written informed consent and assent from the participants, the ophthalmic nurses measured the distance and near VA for each eye separately at distances of 4 m and 40 cm, respectively. Tumbling E LogMAR charts were used for illiterate participants to measure distance VA, while Landolt C charts were employed for near VA. The expected VA for distance and near VA was 0.0 (6/6) and N.5 in each eye, respectively. A pinhole test was carried out when the distance VA was worse than 0.0 (6/6) to determine whether the reduced acuity was because of the refractive error or a pathological cause. Optometrists with at least 5 years of experience conducted refractions on all participants. Both objective refraction and subjective refraction were conducted. The objective refraction findings were used to diagnose refractive error and were also used as the basis for subjective refraction. The autorefractor was used to perform objective refraction at optimal illumination. Subjective refraction was then performed to determine the amount of refractive error, to select glasses that provided comfortable vision and to obtain the final corrected visual acuity[31,32,33] They also performed anterior and posterior segment eye examinations on all participants to determine the possible ocular disorders that decrease the VA. All the findings were verified and documented by the principal investigator. Tropicamide eye drops were used to aid the indirect ophthalmoscopy procedure. Participants with undetermined eye problems were referred to the ophthalmologist for a detailed eye examination, and the required data were collected after the ophthalmologist had confirmed the diagnosis. All study participants with VI were linked to the referral hospital for appropriate management and follow-up. If a participant was diagnosed with more than one disease as the cause of VI, the principal cause of VI for that participant was selected as the disease that is more amenable to treatment or, if not treatable, the one that is more amenable to prevention.[34]

Ethical considerations

Ethical clearance was obtained from the Ghana Health Service Ethics Review Committee with ethics approval number (GHSERC ID 076-04-23), and from the Health Science Research Ethics Committee of the University of the Free State with ID (UFS-HSD2023/0623/2811). The study adhered to the protocols and principles of the Declaration of Helsinki. Participation was voluntary, with written consent forms provided to parents or guardians and assent forms signed by participants under 18. Each study participant had the right to withdraw from the study at any stage. Examination procedures were explained beforehand, and privacy and confidentiality were maintained. Ocular examination results were shared with participants, and those with eye problems received free medication and reading glasses. Data were password-protected, and hard copies were stored securely with limited access, available only to the researcher.

Data management and analysis

After verifying the completeness and consistency of data, the data were coded and entered into the Statistical Package for Social Sciences (version 20; SPSS Inc., Chicago, IL, United States) for analysis. The descriptive part of the present study was summarised by employing descriptive statistics, including frequencies and measures of central tendency. Specifically, the results were diagrammatically presented in tables and bar graphs. Multinomial logistic regression was used to identify the relationship between VI and the associated demographic factors. A *p*-value of less than 0.05 was considered statistically significant.

Results

Socio-demographic and economic characteristics of the study participants

A total of 402 participants, comprising 151 (37.6%) males and 251 (62.4%) females, were included in the study. The mean age of the participants was 42.13 years (standard deviation [s.d.] = 23.49), with an age range from 7 to 96 years. Most participants, 126 (31.3%), were 36–59 years old. Most of the participants were not married (single), 158 (39.30%). Almost a quarter of participants were students, 111 (27.60%), and nearly half, 191 (47.50%), had attended secondary school. Most of the study participants, 392 (97.5%), reported being of the Christian faith (Table 1).

TABLE 1: Socio-demographic and economic characteristics of the study participants (N = 402).

Characteristics	Frequency	%
Age (years)		
< 18	91	22.6
18–35	77	19.2
36–59	126	31.3
≥ 60	108	26.9
Gender		
Male	151	37.6
Female	251	62.4
Marital status		
Single	158	39.3
Married	150	37.3
Widowed	86	21.4
Separated	8	2.0
Occupation		
Student	111	27.6
Farmer	85	21.1
Civil Servant	32	8.0
Trader	92	22.9
Artisan	13	3.2
Unemployed	57	14.2
Others*	12	3.0
Educational status		
Primary	135	33.6
Secondary	191	47.5
Tertiary	36	9.0
No formal education	40	10.0
Religion		
Christianity	392	97.5
Islam	7	1.7
Others**	3	0.7

*, Other forms of occupations; **, Atheism and other forms of religion.

TABLE 2: Prevalence and clinical characteristics of visual impairment among the study participants (N = 402).

Category	Frequency	Prevalence (%)	95% CI	
			Lower	Upper
Presence of VI				
Yes	121	30.10	25.80	34.70
No	281	69.90	65.30	74.20
Gender				
Male	52	12.93	9.90	16.50
Female	69	17.17	13.70	21.10
Age (years)				
< 18 (Children)	18	4.50	2.80	6.80
18–35 (Youth)	15	3.73	1.88	5.58
36–59 (Adults)	37	9.20	6.70	12.30
≥ 60 (Elderly)	51	12.69	9.69	16.23
Type of VI				
Distance- and near-based VI				
Distance VI	39	9.70	7.10	12.90
Near VI	57	14.18	11.00	17.80
Distance + near VI	25	6.22	4.20	8.90
Laterality-based VI				
Bilateral	64	15.92	12.60	19.70
Unilateral	57	14.18	11.00	17.80
Severity of bilateral VI				
Mild	35	8.71	6.20	11.80
Moderate	11	2.74	1.50	4.70
Severe	2	0.50	0.10	1.60
Blindness	16	3.98	1.80	6.20
Severity of unilateral VI				
Mild	49	12.18	9.30	15.70
Moderate	8	1.99	0.90	3.70
Severe	0	0.00	0.00	0.00
Blindness	0	0.00	0.00	0.00

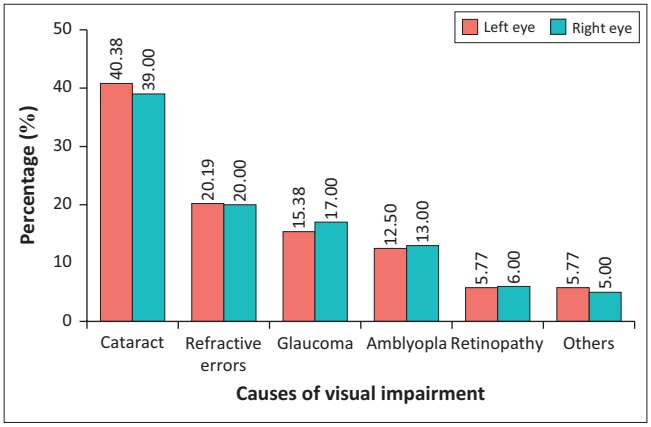
CI, confidence interval; VI, visual impairment.

Prevalence and clinical characteristics of visual impairment among the study participants

The present study found an overall prevalence of VI of 30.10% (95% confidence interval [CI] = 25.80–34.70). The prevalence of VI was higher in females, 17.17% (95% CI = 13.7–21.1), and in participants aged 60 years and older, 12.69% (95% CI = 9.44–15.94). Near VI was the most common type of VI, 14.18% (95% CI = 11.00–17.80). Regarding laterality, bilateral VI accounted for 15.92% (95% CI = 12.60–19.70), compared to unilateral VI. Based on severity, mild VI was most common, with unilateral at 12.18% (95% CI = 9.30–15.70) and bilateral at 8.71% (95% CI = 6.20–11.80). Bilateral blindness was more prevalent, accounting for 3.98% (95% CI = 1.80–6.20) (Table 2).

Causes of the presenting visual impairment and blindness

The leading cause of VI was cataracts, contributing to 39% and 40.38% of VI in the right eye (RE) and left eye (LE), respectively (Figure 1). This was followed by refractive errors (RE = 20%, LE = 20.19%), glaucoma (RE = 17%, LE = 15.38%), amblyopia (RE = 13%, LE = 12.50%) and retinopathy (RE = 6%, LE = 5.77%). Retinopathy included diabetic and hypertensive retinopathies. Other causes included phthisis bulbi, micro-cornea, corneal scar and pseudophakia (RE = 5%, LE = 5.77%).



Note: Causes of visual impairment by eye (right vs. left).

FIGURE 1: Distribution of the causes of visual impairment among the study participants.

Cataract was the leading cause of VI in both sexes (male = 36.59%, female = 38.18%) (Figure 2). Glaucoma (26.83%) was the second most common cause in males, while refractive errors (23.64%) ranked second in females.

Refractive errors were the leading cause of VI among the children (33.33%) and the adults (28.57%) (Figure 3). Among the elderly, cataracts (62.50%) followed by glaucoma (14.58%) were the leading cause of VI. Glaucoma (25%) was also the second leading cause of VI among adult participants aged 60 years and older.

By laterality, refractive errors (48.57%), followed by amblyopia (34.29%), and then cataracts (11.43%) were the leading causes of unilateral VI. Cataract (52.46%) and glaucoma (24.59%) were the leading causes of bilateral visual impairment (Figure 4).

Regarding severity, refractive errors (32.20%) and cataracts (28.81%) were the leading causes of mild VI. Moderate VI was predominantly caused by cataracts (36.84%) and amblyopia (31.58%). Severe VI was caused by cataracts (50%) and retinopathy (50%). Cataract (68.75%) and glaucoma (31.25%) were the two leading causes of blindness (Figure 5).

Factors associated with the presenting visual impairment and blindness

On bivariate analysis, age, marital status and occupation were found to have associations with VI ($P < 0.05$; Table 2). On multivariate logistic regression, age and occupation remained significantly associated with VI (Table 3).

Adults had nearly five times higher odds of VI, while the elderly had 11 times higher odds (AOR: 4.93, 95% CI: 1.14–21.31; AOR: 11.29, 95% CI: 2.41–52.85) compared to the children. Civil service and trading were found to be inversely related to VI. Civil servants and traders had 20% and 28% lower odds of VI than student participants, respectively (Table 4).

Discussion

This study was conducted as part of efforts to establish an eye health social enterprise in the BCM community. Among others, the study sought to establish the state of VI in the BCM by determining the prevalence, distribution and causes of VI in the selected communities. The prevalence of VI in the BCM was higher than the national average reported by Ghana Blindness and Vision Impairment Study.[15] and that reported in a similar study among rural dwellers in Ghana.[22] Furthermore, the prevalence of VI in this study is also higher than reported in previous studies conducted in various locations, including Addis Ababa, South Africa, Ethiopia, South Korea, South Sudan, Saudi Arabia and India.[12,35,36,37,38,39,40]

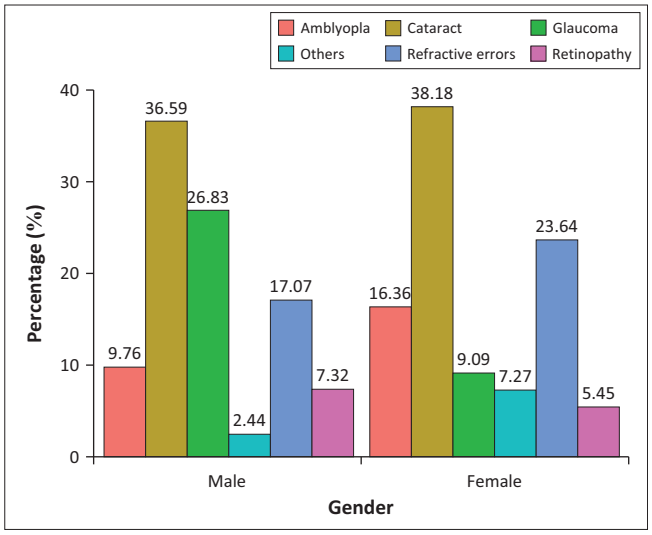


FIGURE 2: Distribution of causes of visual impairment according to sex.

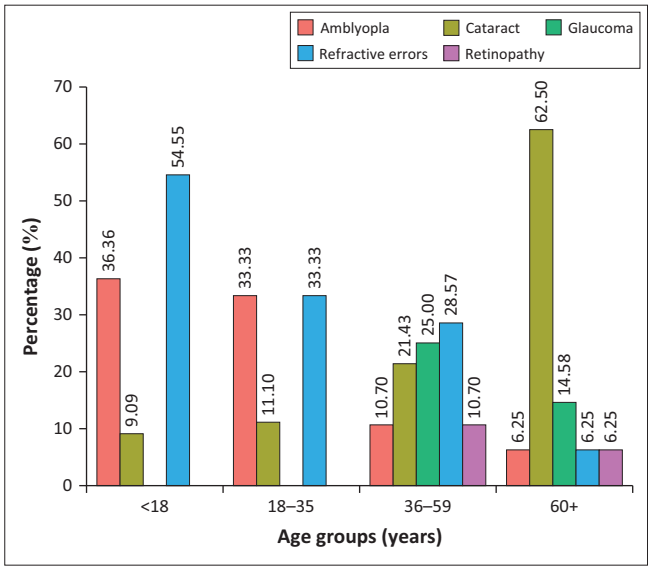


FIGURE 3: Distribution of causes of visual impairment according to age.

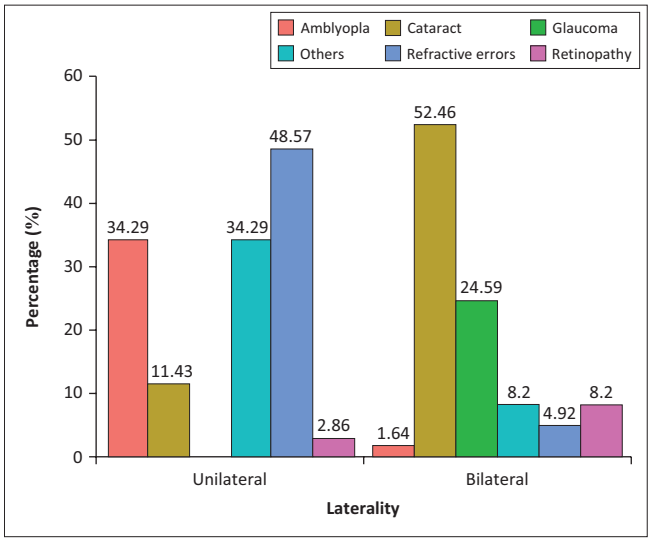


FIGURE 4: Distribution of causes of visual impairment according to laterality.

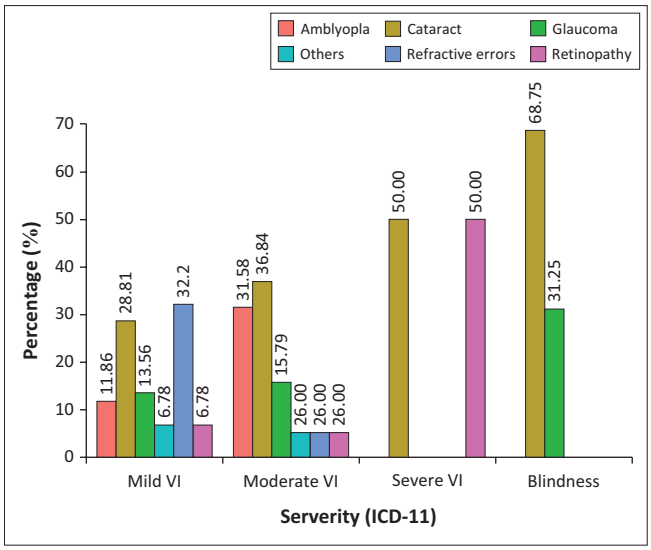


FIGURE 5: Distribution of causes of visual impairment according to severity.

The higher prevalence found in this study could be attributed to how VI was defined. This study defined VI using presenting VA for both distance and near, as recommended by the ICD-11.[29] On the contrary, most previous studies defined VI using distance VA only, as well as defined VI by ICD-10. The use of distance VA alone to define VI will likely underestimate the prevalence of VI in the population. Additionally, compared to the previous studies, this study was conducted in a remote/deprived area where access to healthcare is limited. As postulated, VI is impacted by the availability, accessibility and affordability of eye care services, and the absence of such services increases the magnitude of VI.[13] It can, therefore, be speculated that the higher prevalence of VI in this study could result from the unavailability of eye care services in the communities studied.[28] On the contrary, the prevalence identified in this study was lower compared to that reported in studies conducted in Russia, South Africa and Nepal.[34,41,42] This variance could be attributed to variations in the age range of the research participants. The studies mentioned above encompassed adult populations, with the Russian study focusing on individuals aged 85 and above, while the South African and Nepalese studies included participants aged 60 years and above.

TABLE 3: Association between socio-demographic factors and visual impairment in the better-seeing eye.

Socio-demographic factors	Visual impairment				*P*-value
	No	%	Yes	%	
Age (years)					
< 18	73	26.0	18	14.9	< 0.001
18–35	62	22.1	15	12.4	-
36–59	89	31.7	37	30.6	-
≥ 60	57	20.3	51	42.1	-
Gender					
Male	99	35.2	52	43.0	0.730
Female	182	64.8	69	57.0	-
Marital status					
Single	124	44.1	34	28.1	0.02
Married	100	35.6	50	41.3	-
Widowed	50	17.8	36	29.8	-
Separated	7	2.5	1	0.8	-
Educational level					
Primary	94	33.5	41	33.9	0.790
Secondary	134	47.7	57	47.1	-
Tertiary	27	9.6	9	7.4	-
No formal education	26	9.3	14	11.6	-
Occupation					
Student	85	30.2	26	21.5	0.010
Farmer	51	18.1	34	28.1	-
Civil Servant	27	9.6	5	4.1	-
Trader	69	24.6	23	19.0	-
Artisan	9	3.2	4	3.3	-
Unemployed	34	12.1	23	19.0	-
Others	6	2.1	6	5.0	-
Religion					
Christianity	275	97.9	117	96.7	0.790
Islam	4	1.4	3	2.5	-
Others	2	0.7	1	0.8	-

%, Percentage.

This study found a significant association between age and the prevalence of VI. Age increased the risk of developing VI, with people aged 60 and older (the elderly) having the highest risk of VI (AOR 11.29, 95% CI, 2.41–52.85, $P < 0.002$). This finding agrees with global trends indicating that age is a critical determinant of VI, with older age groups consistently showcasing higher rates of VI than younger age categories.[2,12,18,36,37,38,43,44] One study suggests that the higher risk of VI in older age could be because of the weakening of the bodily cells and functions, as well as the presence of senile diseases such as diabetes and hypertension.[45] The increased risk of VI with age presents a unique global health challenge, even more so for Ghana. Ghana has a relatively young population that will age in a few years. The burden of VI in the country is likely to increase drastically with a growing ageing population.[18] The situation becomes more distressed when taking into account that Boadi-Kusi et al.[28] reported that the risk of VI is higher in rural communities in Ghana because of eye care personnel's predilection for urban

TABLE 4: Socio-demographic factors associated with the likelihood of visual impairment in the better-seeing eye.

Socio-demographic factors	Univariate			Multivariate		
	COR	95% CI	*P*-value	AOR	95% CI	*P*-value
Age (years)						
< 18	-	-	0.000	-	-	0.007*
18–35	1.07	0.52, 2.23	0.849	2.42	0.88, 6.7	0.088
36–59	1.81	0.95, 3.45	0.069	4.93	1.14, 21.31	0.033*
≥ 60	4.06	2.13, 7.73	0.000	11.29	2.41, 52.85	0.002*
Marital status						
Single	-	-	0.003	-	-	0.588
Married	2.05	1.24, 3.4	0.005	1.03	0.35, 3.06	0.962
Widowed	2.63	1.48, 4.65	0.001	1.00	0.30, 3.30	0.998
Separated	0.52	0.06, 4.38	0.548	0.22	0.02, 2.43	0.217
Occupation						
Student	-	-	0.008	-	-	0.154
Farmer	2.29	1.24, 4.24	0.008	0.43	0.13, 1.46	0.176
Civil Servant	0.61	0.21, 1.73	0.349	0.20	0.05, 0.82	0.026*
Trader	1.15	0.61, 2.19	0.661	0.28	0.09, 0.91	0.034*
Artisan	1.45	0.41, 5.11	0.560	0.51	0.11, 2.38	0.393
Unemployed	2.55	1.29, 5.06	0.007	0.37	0.10, 1.33	0.126
Others	3.27	0.97, 11.01	0.056	0.90	0.18, 4.40	0.896

*P-value significant at 0.05; COR, Crude odds ratio; AOR, adjusted odds ratio; CI, confidence interval.

areas over rural areas. Therefore, early conscious efforts are required to address the burden of VI in Ghana, especially in rural communities.

The leading causes of VI identified in this study are cataracts and uncorrected refractive errors, which accounted for about a quarter and a fifth of all cases of VI, respectively. This finding is broadly consistent with previous studies on the African continent. In a review of the literature on VI in Africa, two studies reported the leading causes of VI in sub-Saharan Africa to be uncorrected refractive error and cataracts.[2,46] In Ghana, similar causes of VI have been reported. The Ghana Blindness and VI Survey also identified refractive errors and cataracts as the principal causes of VI[15] in the country. Similar findings have been reported by Akpabla and Signes-Soler and Boadi-Kusi et al.[22,47] In the present study, the causes of VI differed by age group, with cataracts being more prevalent in the older participants and uncorrected refractive error contributing heavily to VI in the participants aged 18 and below. It has been contended that cataracts are common in the aged because of 'physiological deterioration'. The argument is that ageing is associated with a reduced efficiency of the body's functionality and a consequent rise in metabolic diseases such as cataracts and retinopathies.[48] More so, uncorrected refractive error may be higher in children because of prolonged indoor activities and increased near work (sustained accommodation).[49] In addition, the lack of awareness of poor vision, reduced purchasing power among children and the negative societal views of children wearing glasses could contribute to the higher prevalence of uncorrected refractive errors and amblyopia in this age group.[50]

The leading causes of VI in this study are treatable. Cataracts can be treated by an uneventful yet fast and safe surgical procedure.[51] Similarly, a simple pair of spectacles or contact lenses can treat refractive errors.[52] Although other causes of VI, such as glaucoma, amblyopia and retinal diseases, contributed a smaller proportion, their presence cannot be overlooked. Therefore, urgent and comprehensive strategies are required to address the causes of VI in rural communities in Ghana.

The present study was, however, not without limitations. Given the numerous rural communities in BCM, selecting only two for this study was largely insufficient to represent the rural population of the municipality adequately. Additionally, the study only considered rural communities; hence, the results cannot be generalised to urban settings in the Eastern region.

Conclusion

A high prevalence of VI among the rural residents was found. The main causes of VI included cataracts and refractive errors, whereas the leading cause of severe VI and blindness was cataract, retinopathy and glaucoma. Near VI was the most prevalent type of VI recorded in this study. Therefore, the researchers recommend establishing vision centres in rural communities, establishing Local Eye Screening Programmes and including optometric facilities in the national health insurance scheme to expand accessibility to eye health in rural communities.

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contribution

B.V.O., M.D., T.R. and S.K. spearheaded the conceptualisation and design of the research framework and guaranteed the integrity and accuracy of the data analysis throughout the study. B.V.O. and B.A. were responsible for data acquisition, analysis and interpretation. B.V.O. and B.A. drafted the manuscript, while M.D., T.R. and S.K. provided critical intellectual reviews. M.D., T.R. and S.K. supervised the research process, providing essential guidance and oversight.

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Data availability

The data that support the findings of this study are available from the corresponding author, B.V.O., on reasonable request.

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