Journal of Science and Technology, Vol. 44, No. 1 (2026), pp. 47 - 64
Kwame Nkrumah University of Science and Technology (KNUST)
https://dx.doi.org/10.4314/just.v44i1.4

KNOWLEDGE AND AWARENESS OF AGE-RELATED EYE CONDITIONS AMONG ADULTS IN OFORIKROM MUNICIPALITY, GHANA

Mohammed Abdul-Kabir[1*], Michael Kwesi Asante[1], Bright Boakye[1], Felix Kofi Awuriki[1], Prince Mintah[1], Abdul-Sadik Ahmed[1], Nana Yaa Koomson[1], Richchris Konadu Yiadom[1], Isabella Amoabeng Sam[2], Stephanie Adjei[1], Ernest Dartey Kumi[1]

[1]Department of Optometry and Visual Science, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

[2]Department of Health Promotion and Disability Studies, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

***Corresponding author: kabir265@gmail.com**

ABSTRACT

***Purpose**: This study aimed to assess the level of awareness and knowledge regarding age-related eye conditions among adults in Oforikrom Municipality, Ghana.*

***Methods**: A population-based cross-sectional survey was conducted among adults aged 40 years and above in the Oforikrom Municipality. A structured interviewer-guided questionnaire was used to collect data on demographic characteristics, awareness, knowledge, and sources of information regarding age-related eye conditions. Descriptive statistics were used to present data as frequencies and percentages. A logistic regression analysis was employed to determine relationships between variables.*

***Results**: A total of 250 participants responded to the questionnaire. The mean (±SD) age of the participants was 51.2 (±9.4) years. Of the participants, 55.2% were females, 69.6% were employed, and 80.0% had formal education. Awareness of cataract (94.4%) and glaucoma (74.0%) was high in this population, while they were low for presbyopia (36.4%) and age-related macular degeneration (7.2%). The major sources of information on age-related eye conditions were: family and friends (16.7%), television (14.9%), and healthcare professionals (11.4%). Participants demonstrated low knowledge of the conditions: cat racts (57.2%), glaucoma (82.0%), presbyopia (86.4%) and AMD (97.2%). Religious affiliation (p=0.003), higher level of education (p=0.001) and frequent eye examination (p=0.025) were found to be positively associated with awareness of cataract, glaucoma and AMD, respectively.*

***Conclusion:** The study revealed high awareness of cataract and glaucoma, but low for presbyopia and AMD. Interventions, particularly ocular health education on age-related eye conditions, should be intensified to ensure timely diagnosis and treatment.*

Keywords: Age-related, awareness, eye conditions, knowledge, Ghana.

INTRODUCTION

Knowledge and awareness of adults' eye health is crucial for developing successful eye care initiatives (Capó *et al*., 2022). Vision is a fundamental sense that profoundly impacts an individual's quality of life, and its preservation is crucial as people age (de Carvalho Cordeiro *et al*., 2021). Awareness and knowledge of common eye conditions play an important role in encouraging people to seek timely treatment for their eye problems. A major factor hindering public health strategies is the lack of requisite knowledge and awareness of eye conditions that hinders the promotion of eye health (Pallerla *et al*., 2020). Age-related eye conditions such as age-related macular degeneration, cataracts, and glaucoma are among the leading causes of visual impairment and blindness worldwide, especially among older adults (Bourne *et al*., 2018). Age-related eye conditions remain a significant public health concern in Africa, particularly in settings where access to quality eye care services is limited and health systems are under-resourced (Bechange *et al*., 2020a). Patients with chronic eye disorders who possess health literacy or are informed about eye health have better eye health outcomes and a better integration into the healthcare system than those with less knowledge and literacy (Kamińska *et al*., 2023).

In Ghana, presbyopia, cataracts, glaucoma, and age-related macular degeneration (AMD) are among the common age-related eye conditions (Kumah *et al*., 2011, Bourne *et al*., 2013, Nuertey *et al*., 2019). Projection results indicate that by 2050, the aged population in Ghana will account for 14.1 percent of the total population (Mba, 2010). Given Oforikrom Municipality's status as one of the most populous municipalities in the Ashanti region of Ghana, where the average regional population growth rate is estimated at 1.2 according to the Ghana Statistical Service, there is an anticipation of an upward trend in the prevalence of age-related eye conditions (GSS, 2021). This expectation is compounded by socioeconomic and cultural factors within the municipality (Aberese-Ako *et al*., 2023), which exacerbate the issue of inadequate awareness and knowledge about these conditions. Thus, addressing both eye care delivery systems and lifestyle factors becomes imperative to mitigate the anticipated increase in prevalence. Healthcare resources are generally limited in most regions of Ghana and access to specialised eye care services can be challenging. Hence, the level of awareness and knowledge among the general population regarding these eye conditions takes on even greater significance (Bechange *et al*., 2020b, Rao, 2015). Despite the growing awareness and knowledge of age-related eye conditions in global public health (Assi *et al*., 2021), there is a paucity of literature on the knowledge and awareness of these age-related conditions among adults in Ghana. The absence of comprehensive, context-specific data impedes the development of targeted interventions, making it challenging to understand the awareness and knowledge levels of these eye conditions among adults. Therefore, there is a pressing need to raise awareness of age-related eye conditions to promote preventive measures, early detection, and proper management of these conditions. By increasing awareness and providing access to quality eye care services, it is possible to mitigate the negative impact of age-related eye conditions and improve the overall health and well-being of the elderly population in Ghana. Hence, the purpose of this study is to determine the awareness and knowledge of age-related eye conditions among adults in the Oforikrom Municipality, Ashanti Region of Ghana.

METHODS

Data and Sampling

This is a descriptive cross-sectional study, conducted between September 2023 and June 2024, to assess the knowledge and awareness of age-related eye conditions among adults in Oforikrom Municipality in the Ashanti region of Ghana. Oforikrom Municipality is one of the 18 municipalities in the Ashanti region of Ghana. It shares borders with Bosomtwe, Ejisu, Asokore Mampong, Kumasi Metropolitan Assembly, and Asokwa (Asante *et al*., 2024). Oforikrom Municipal Assembly's population is 213,126 with 107,426 males and 105,700 females (Ghana, 2021a). The most densely populated community is Ayigya with a projected population of 67,604, whilst the least densely populated is Bebre with a projected population of 2,667 (Ghana, 2021b). The study included adults aged 40 and above residing in the Oforikrom municipality. The number of adults aged 40 years and above in the municipality is estimated at 29,667 (Service, 2021). Individuals who met the inclusion criteria were approached and were informed about the research purpose, procedures, and their voluntary participation. Only those who provided informed consent were included in the study. Five localities—Tech, Bomso, Ayigya Zongo, Ayigya Akatego, and Ahenbronum—were selected randomly from the fifteen electoral areas in the municipality using the lottery method. The names of all electoral areas were written on identical slips of paper, folded, placed in a container, mixed, and five were drawn without replacement. Within each selected locality, participants were recruited through convenience sampling. Two trained researchers visited households and public areas and invited eligible and available adults to participate in the study. Fifty participants were enrolled from each locality, resulting in a total sample size of 250.

Data Collection

Data was collected with the help of two trained researchers who conducted guideline interviews using a semi-structured questionnaire. The questionnaire was pretested and modified through cognitive interviews to ensure reliability and validity. The questionnaire included sections dedicated to respondents' demographics and each of the four age-related eye conditions: presbyopia, cataract, glaucoma, and age-related macular degeneration (AMD). The first section measured the demographic data including: age, sex, education, locality, religion, employment status and health finance plan. The second section measured participants' awareness and knowledge of each eye condition. Participants were asked to indicate Yes or No (Aware or Unaware) whether they had heard of presbyopia, cataract, glaucoma, or AMD. Participants who answered YES to being familiar with any of the age-related eye conditions were asked to answer the second set of questions to evaluate participants' knowledge of each eye condition they were familiar with. The questionnaire contained items that assessed the knowledge related to symptoms, risk factors, preventive measures, and available treatment options for each of the age-related eye conditions. A participant was graded as having high knowledge about a particular age-related eye condition when he or she answered >6 questions correctly, moderate knowledge when he or she answered 4-6 questions correctly and low knowledge when he or she answered <4 questions correctly. However, for presbyopia, the grading scale was adjusted: <2 correct answers were rated as low knowledge, 2 correct answers were rated as moderate knowledge, and >2 correct answers were rated as high knowledge. Table 1

Ethical considerations

The study was approved by the Committee on Human Research, Publication and Ethics of the Kwame Nkrumah University of Science and Technology, Kumasi, Ghana (CHRPE/AP/552/23) after permission was obtained from the Municipal Chief Executive in Oforikrom Municipal Assembly to conduct the study in the municipality. The study obtained informed consent from all participants and adhered to the Tenets of the Declaration of Helsinki.

Data analysis

The data for the survey were processed and analysed in Statistical Package and Service Solution version 25, compatible with Windows 11 (IBM corporation IBM® SPSS® statistics for Windows, version 25.0 Armonk, NY). Descriptive statistics were used to present data as frequencies and percentages. Chi-square tests and binary logistic regression analysis were employed to evaluate relationships between variables. At a 95% confidence interval, p-values of ≤ 0.05 were considered to be significant.

Table 1: Grading criteria for knowledge assessment on age-related eye conditions.

Variable	Score				
	Minimum	Maximum	Low	Moderate	High
Knowledge of presbyopia	0	4	< 2	= 2	> 2
Knowledge of cataract	0	10	< 4	4 - 6	> 6
Knowledge of glaucoma	0	9	< 4	4 - 6	> 6
Knowledge of AMD	0	9	< 4	4 - 6	> 6

RESULTS

Socio-demographic characteristics of participants

A total of 250 participants responded to the questionnaire. The mean (±SD) age of the participants was 51.2 (±9.4) years. The majority were females (55.2%, n=138), 69.6% (n=174) were employed, and only 20.0% (n=85) had no formal education. Two out of five participants (40.0%, n=100) had never had an eye examination. Most participants (59.7%, n=188) reported that their healthcare financing was through the NHIS. Table 2 presents the detailed demographic characteristics.

Table 2: Socio-demographic characteristics of participants

Characteristics	n (%)
Gender	
Male	112 (44.8)
Female	138 (55.2)
Highest level of education	
No formal education	85 (20.0)
High School	58 (13.7)
Senior high	42 (9.9)
Tertiary	65 (15.3)
Health finance plan *	
NHIS	188 (59.7)
Out of Pocket	109 (34.6)
PHIS	18 (5.7)
Religion	
Christianity	206 (82.4)
Muslim	38 (15.2)
Other	6 (2.4)
Employment status	
Employed	174 (69.6)
Unemployed	76 (30.4)
Frequency of eye examination	
Annually	18 (7.2)
Every 2-3 years	10 (4.0)
Only when experiencing vision problems	63 (25.2)
Once a while	59 (23.6)
Never had an eye examination	100 (40.0)

n(%), percentages and frequencies of participants; *n≠250 (multiple responses)

Awareness of age-related eye conditions

Awareness of AMD and presbyopia was very low, with only 7.2% (n=18) and 36.4% (n=91) of the participants indicating having ever heard of these conditions, respectively. Of the participants, the majority had heard of glaucoma (74.0%, n=185) and cataract (94.4%, n=236). Table 3 shows the awareness of the various age-related eye conditions.

Table 3: Awareness of age-related eye conditions among the participants

Variables	Presbyopia		Cataract		Glaucoma		AMD	
	Aware (n= 91, 36.4%)	Unaware (n=159, 63.6%)	Aware (n=236, 94.4%)	Unaware (n=14, 5.6%)	Aware (n=185,74.0%)	Unaware (n=65, 26.0%)	Aware (n=18, 7.2%)	Unaware (n=231,92.8%)
Gender								
Female	43, 31.2%	95, 68.8%	130, 94.2%	8, 5.8%	95, 68.8%	43, 31.2%	12, 4.4%	131, 95.6%
Male	48, 40.8%	64, 71.2%	106, 94.6%	6, 5.4%	90, 80.4%	22, 19.6%	18, 10.7%	100, 89.3%
Highest level of education								
No formal education	26, 30.9%	59, 69.4%	78, 91.8%	7, 8.2%	43, 50.6%	42, 49.4%	3, 3.6%	81, 96.4%
Junior high	21, 36.2%	37, 63.8%	57, 98.3 %	1, 1.7%	45, 77.6%	13, 22.4%	3, 5.2%	55, 94.8%
Senior high	16, 38.1%	26, 61.9%	38, 90.5%	4, 9.5 %	35, 83.3%	7, 16.7%	2, 4.8%	40, 95.2%
Tertiary	28, 43.1%	37, 56.9%	63, 96.9%	2, 3.1%	62, 95.4%	3, 4.6%	10, 15.4%	55, 84.6%
Frequency of eye examination								
Annually	9, 50.0%	9, 50.0%	17, 94.4%	1, 5.6%	16, 88.9%	2, 11.1%	5, 27.8%	13, 72.2%
Every 2-3 years	5, 50.0%	5, 50.0%	10, 100.0%	0, 0.0%	8, 80.0%	2, 20.0%	3, 30.0%	7, 70.0%
Only when experiencing vision problems	17, 27.0%	46, 73.0%	60, 95.2%	3, 4.8 %	53, 84.1%	10, 15.9%	4, 6.3%	59, 93.7%
Once a while	28, 47.5%	31, 52.5%	57, 96.6%	2, 3.4%	44, 74.6%	15, 25.4%	5, 8.5%	54, 91.5%
Never had an eye examination	32, 32.0%	68, 68.0%	92, 92.0%	8, 8.0%	64, 64.0%	36, 36.0%	1, 1.0%	98, 99.0%
Religion								
Christianity	76, 36.9%	130, 63.1 %	198, 96.1%	8, 3.9%	155, 75.2%	51, 24.8%	16, 7.8%	189, 92.2%
Muslim	14, 36.8%	24, 63.2%	34, 89.5%	4, 10.5%	26, 68.4%	12, 31.6%	2, 5.3%	36, 94.7%
Other	1, 16.7%	5, 83.3%	4, 66.7%	2, 33.3%	4, 66.7%	2, 33.3%	0, 0.0%	6, 100.0%
Employment status								
Employed	65, 37.4%	109, 62.6%	165, 94.8%	9, 5.2%	141, 81.0%	33, 19.0%	13, 7.5%	165, 92.5%
Unemployed	26, 34.2%	50, 65.8%	5, 6.6%	71, 93.4%	44, 57.9%	32, 42.1%	18, 6.6%	71, 93.4%

n(%); frequencies and percentages of the participants.

Knowledge about age-related eye conditions

Overall, participants demonstrated low knowledge about the various age-related eye conditions. Over 80% of participants had low knowledge about presbyopia (86.4%, n=216), AMD (97.2%, n=243), and glaucoma (82.0%, n=205). Knowledge about cataract was relatively high compared to the other age-related eye conditions with 22.0% (n=55) and 20.8% (n=52) exhibiting moderate and high knowledge respectively. Figure 1 shows the percentage distribution of the participants' knowledge regarding age related eye conditions.

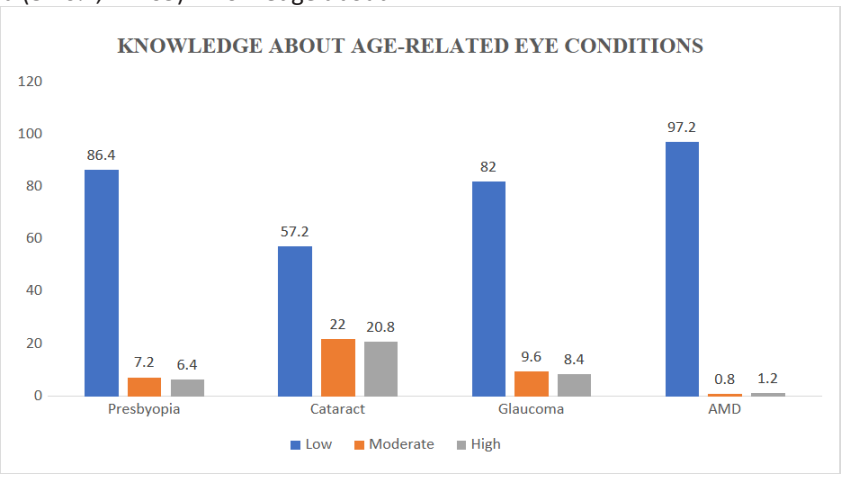


Figure 1: Distribution of participants' knowledge about the various age-related eye conditions.

Of the participants, only 8.8% correctly identified that presbyopia usually begins around age 40. Presbyopia can be corrected with glasses, it is a natural part of ageing, and it only affects near vision were correctly answered by 11.6%, 16.3% and 6.0% of the participants, respectively. Misconceptions included that presbyopia can be reversed or cured (6.3%) and that it is caused by eye disease (6.0%). Correct responses on the knowledge about cataract were: clouding of the eye's lens (26.6%), it is a reversible condition (20.5%), it can cause blurry vision (22.0%), and it can be prevented or delayed (14.0%). The most commonly identified cataract risk factors were ageing (20.0%), family history of cataracts (15.0%), and diabetes (12.1%).

Glaucoma can cause irreversible vision loss, and it is often associated with increased intraocular pressure, was given by 14.8% and 11.9% of the participants, respectively. However, 11.6% incorrectly believed glaucoma can be cured with medication. Family history (16.6%), ageing (14.5%), and diabetes (12.9%) were the common risk factors identified by the participants. AMD is a progressive eye condition, it can lead to significant vision loss or blindness, and it affects the central part of the retina (macula) were correctly answered by 1.9%, 3.4% and 1.9% of the participants, respectively. Of the participants, only 14.4% identified any risk factors, with family history (4.0%), high blood pressure (2.9%), and smoking (2.9%) being the most commonly recognised risk factors. Table 4 shows participants' knowledge about the items included in the assessment of knowledge about age-related eye conditions.

Table 4: Distribution of participants' knowledge on age-related eye conditions.

Age-related eye conditions		n (%)
	Presbyopia	
Age presbyopia starts	30 years	10 (4.0)
	40 years	22 (8.8)
	50 years	16 (6.4)
	60 years	13 (5.2)
	70 years	2 (0.8)
	Do not know	187 (74.8)
What participants believe to be true about presbyopia	Natural part of aging	49 (16.3)
	Can be corrected with glasses	35 (11.6)
	Can be reversed or cured	19 (6.3)
	Only affects near vision	18 (6.0)
	Caused by eye diseases	18 (6.0)
	Do not know	54 (10.3)
Cataract		
What participants believe to be true about cataract	Clouding of the eye's lens	139 (26.6)
	Reversible condition	107 (20.5)
	Can cause blurry or dim vision	115 (22.0)
	Only affects older adults	35 (6.7)
	Can be prevented or delayed	73 (14.0)
	Do not know	73 (14.0)
Risk factors of cataract	Aging	132 (20.0)
	Family history of cataract	99 (15.0)
	Diabetes	80 (12.1)
	Eye injury or trauma	79 (12.0)
	Smoking	79 (12.0)
	UV radiation exposure	72 (10.9)
	Excessive alcohol consumption	46 (7.0)
	Do not know	73 (11.1)

Glaucoma			
	What participants believe to be true about glaucoma.	A group of eye diseases	37 (10.8)
		Can cause irreversible vision loss	51 (14.8)
		Often associated with increased IOP	41 (11.9)
		Only affects older adults	25 (7.3)
		Can be cured with medication	40 (11.6)
		Do not know	150 (43.6)
	Risk factors of glaucoma	Family history of glaucoma	72 (16.6)
		Aging	63 (14.5)
		Diabetes	56 (12.9)
		High eye pressure	49 (11.3)
		Eye injury or trauma	37 (8.5)
		Ethnicity	13 (3.0)
		Do not know	143 (33.0)
AMD			
	What participants believe to be true about AMD.	A progressive eye disease	5 (1.9)
		Affects the central part of the retina (macula)	5 (1.9)
		Lead to significant vision loss or blindness	9 (3.4)
		Only a concern for older adults	4 (1.5)
		Can be cured with medication or surgery	3 (1.1)
		Do not know	240 (90.2)
	Risk factors of AMD	Family history of AMD	11 (4.0)
		High blood pressure	8 (2.9)
		Smoking	8 (2.9)
		Aging	6 (2.2)
		Obesity	4 (1.4)
		Ultraviolet (UV) light exposure	3 (1.1)
		Do not know	238 (85.6)

n (%), frequencies and percentages of participants.

Factors influencing awareness and knowledge of age-related eye conditions

A binary logistic regression was performed to assess the association between a number of demographic factors and awareness of the various age-related eye conditions, as well as knowledge about the conditions. The model contained six independent variables; age, sex, highest level of education, frequency of eye examination, religion and employment status. Religious affiliation was found to be significantly associated with awareness of cataract with Muslims having significantly higher odds of being aware of the condition (OR:33.04, p=0.003). Higher level of education: Junior high (OR; 3.12, p=0.007), senior high (OR; 3.60, p=0.013) and tertiary (OR; 16.32, p=0.001) were found to be significantly associated with awareness of glaucoma. Participants who regularly underwent eye examinations: Every 2-3 years (OR; 36.65, p=0.025) and only when experiencing vision problems (OR; 36.00, p=0.038) had significantly higher odds of being aware of AMD. No statistically significant association was found between any of the sample characteristics and awareness of presbyopia ($p > 0.05$) as shown in Table 5.

Educational level and frequency of eye examinations were the only significant predictors of participants' knowledge about age-related eye conditions. Participants with some level of education; Senior high (OR; 4.67, p=0.021) or tertiary (OR; 7.65, p=0.001) had higher odds of being knowledgeable about the age-related eye conditions than those who had no formal education. Additionally, participants who had their eyes checked annually (OR; 4.99, p=0.017) were more likely to be well-informed about these conditions compared to those who had never undergone an eye examination (see Table 6).

Table 5: Binary logistic regression showing relationship between participant characteristics and awareness of age-related eye conditions

Variables	AGE-RELATED EYE CONDITIONS							
	Presbyopia		**Cataract**		**Glaucoma**		**AMD**	
	OR (C.I)	p-value	OR (C.I)	p-value	OR (C.I)	p-value	OR (C.I)	p-value
Sex								
Female	Ref		Ref		Ref		Ref	
Male	1.67 (0.93-3.01)	0.085	1.50(0.42-5.37)	0.531	1.33(0.65-2.71)	0.440	1.64(0.50-5.38)	0.417
Age (years)	1.00 (0.97-1.03)	0.938	0.96 (0.91-1.02)	0.163	1.00(0.96-1.03)	0.928	0.99(0.93-1.06)	0.791
Highest level of education								
No formal education	Ref		Ref		Ref		Ref	

Junior high	1.23 (0.58-2.64)	0.589	5.76 (0.46-72.14)	0.175	3.12(1.37-7.09)	0.007	1.29(0.21-8.02)	0.786
Senior high	1.00 (0.42-2.38	0.999	0.41 (0.09-1.99)	0.270	3.60(1.31-9.95)	0.013	0.82(0.10-6.52)	0.848
Tertiary	1.27 (0.56-2.86)	0.572	2.22 (0.27-17.91)	0.452	16.32(4.09-65.21)	0.001	1.83(0.34-9.86)	0.482
Frequency of eye examination								
Annually	Ref		Ref		Ref		Ref	
Every 2-3 years	0.80 (0.16-3.88)	0.164	0.42 (0.01-14.26)	0.632	0.43(0.04-0.76)	0.494	36.65(1.56-860.40)	0.025
Only when experiencing vision problems	0.41 (0.13-1.29)	0.131	0.55 (0.08-7.26)	0.531	0.11(0.01-1.20)	0.070	36.00(1.23-1054.13)	0.038
Once a while	0.98 (0.32-3.02)	0.316	0.41 (0.03-6.35)	0.526	0.78(0.15-4.07)	0.772	6.91(0.34-140.86)	0.209
Never had an eye examination	2.12 (0.32-14.20)	0.317	0.56 (0.03-11.92)	0.713	(0.31(0.05-1.80)	0.192	10.63(0.48-236.02)	0.135
Religion								
Christianity	Ref		Ref		Ref		Ref	
Muslim	0.86(0.40-1.86)	0.708	33.04(3.36-324.54)	0.003	3.09(0.38-25.04)	0.290	0.73(0.48-36.02)	0.634
Other	0.30 (0.03-2.72)	0.286	8.70 (0.77-98.81)	0.081	2.12(0.23-19.26)	0.503	1.96(0.10-13.40)	0.712
Employment status								
Employed	Ref		Ref		Ref		Ref	
Unemployed	1.06(0.55-2.03)	0.872	1.07 (0.26-4.39)	0.928	1.95(0.96-3.99)	0.066	0.54(0.13-2.23)	0.393

OR = OD Ratio; C. I= Confidence Interval; Statistical significance considered at (p < 0.05).

Table 6: Binary logistic analysis of participants knowledge on the age-related eye conditions and associated factors.

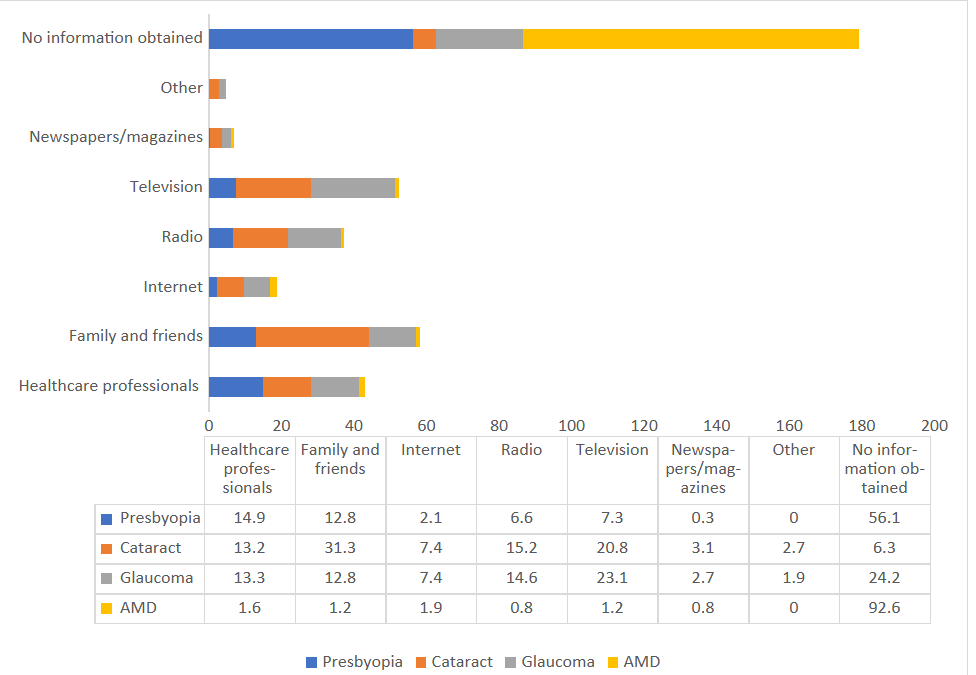
Variables	OR (C.I)	p-value
Sex		
Female	Ref	
Male	0.73 (0.33 - 1.62)	0.445
Age in years	1.04 (0.99 - 1.08)	0.098
Religion		
Christianity	Ref	
Muslim	0.86 (0.29 - 2.59)	0.793
Other	0.00 (0.00 - 1.00)	0.999

Employment status		
Employed	Ref	
Unemployed	1.05 (0.40 - 2.77)	0.918
Highest level of education		
No formal education	Ref	
Junior high	2.95 (0.81 - 10.79)	0.103
Senior high	4.67 (1.26 - 17.35)	0.021
Tertiary	7.65 (2.21 - 26.55)	0.001
Frequency of eye examination		
Never had an eye examination	Ref	0.199
Annually	4.99 (1.34 - 18.67)	0.017
Every 2-3 years	2.62 (0.52 - 13.33)	0.245
Only when experiencing vision problems	1.63 (0.58 - 4.55)	0.353
Once in a while	1.96 (0.72 - 5.38)	0.189

OR = OD Ratio; C. I= Confidence Interval; Statistical significance considered at ($p < 0.05$).

Sources of information on age-related eye conditions

The major sources of information on age-related eye conditions were family and friends (16.7%), followed by Television (14.9%) and healthcare professionals (11.4%). The internet (5.3%) and newspapers/magazines (2.0%) were among the least used sources of information for the participants. Figure 2 shows participants' sources of information on the various age-related eye conditions.



	Healthcare professionals	Family and friends	Internet	Radio	Television	Newspapers/magazines	Other	No information obtained
Presbyopia	14.9	12.8	2.1	6.6	7.3	0.3	0	56.1
Cataract	13.2	31.3	7.4	15.2	20.8	3.1	2.7	6.3
Glaucoma	13.3	12.8	7.4	14.6	23.1	2.7	1.9	24.2
AMD	1.6	1.2	1.9	0.8	1.2	0.8	0	92.6

Figure 2: Stacked bar chart indicating participants' sources of information on age-related eye conditions in Oforikrom Municipality.

DISCUSSION

This study revealed high levels of awareness regarding cataract and glaucoma, but low awareness of presbyopia and age-related macular degeneration (AMD) among participants. However, despite the varying levels of awareness, there was generally very low knowledge across all the age-related eye conditions assessed in this study.

Glaucoma

Although 74.0% of participants had heard of glaucoma, 82.0% had low knowledge of the disease, and only 10.8% correctly defined it. This gap mirrors trends in other studies. For instance, Rewri and Kakkar (2014) found that only 1.89% of rural Indians knew what glaucoma was, and Katibeh *et al*. (2014) reported that just 19.2% of an Iranian population could correctly define it. These consistently low figures may be due to the asymptomatic nature of glaucoma in its early stages and the lack of visible signs, which often delay recognition and understanding. A considerable proportion (11.6%) of our participants wrongly believed that glaucoma can be cured with medication, which echoes findings from South India (Sathyamangalam *et al*., 2009). Furthermore, only 14.8% knew that glaucoma causes irreversible vision loss—lower than the 28.0% reported in Abokobi, Ghana (De-Gaulle and Dako-Gyeke, 2016), and 63.5% in Southeast Nigeria (Kizor-Akaraiwe *et al*., 2017). These differences may stem from variations in urbanisation, education, and access to eye care services. For example, the higher knowledge in urban Nigeria could reflect stronger outreach or clinical programs integrated into primary healthcare. Regarding risk factors, only one-third of participants could name any, with family history

(16.6%) and ageing (14.5%) being the most recognised. This is still relatively higher than Sathyamangalam *et al*. (2009), where only 1.4% identified family history and diabetes as risk factors. Educational level was significantly associated with glaucoma awareness in our study, consistent with findings from Ethiopia, India, and the Netherlands (Nkum *et al*., 2015, Alemu *et al*., 2017, Maharana *et al*., 2017, Hoevenaars *et al*., 2006, Celebi, 2018).

Presbyopia

Awareness of presbyopia was low (36.4%), and over 86.0% of participants had low knowledge about the condition. These findings mirror similar studies in Ghana (Koduah *et al*., 2019) and the UK (Hutchins and Huntjens, 2021). However, a significantly higher awareness was reported in India (74.1%) (Singh *et al*., 2022) and Malaysia (61.0%) (Kay *et al*., 2017), likely due to more active community eye health education and better integration of vision care into primary health services. Knowledge of presbyopia was notably low in this study. Only 8.8 percent of participants correctly identified its typical onset age, and fewer than 12% were aware that it can be corrected with glasses or that it is a natural part of ageing. In contrast, Singh *et al*. (2022) reported that over 80 percent of their respondents knew presbyopia is correctable with glasses. This highlights the need for clearer communication about common, treatable vision conditions. Although previous studies, such as Gajapati *et al*. (2017), found associations between demographic factors like gender and age and awareness of presbyopia, no such associations were observed in our study. This may be attributed to the sample size or specific cultural characteristics of the study population.

Cataract

Cataract was the most widely recognised condition, with 94.4% awareness. This aligns with findings from previous studies in Ghana (Akowuah and Abdul-Sadik, 2018) and Nepal (Shrestha and Shrestha, 2018), suggesting that cataract is more visible, frequently discussed, or linked to local eye health programs. However, awareness alone did not translate into understanding. Only 26.6% of participants could correctly define cataract as the clouding of the eye's lens, a lower figure than the 62.5% reported by Akowuah and Abdul-Sadik (2018). Similarly, only 20.5% knew cataract was reversible, compared to 59.1% in Ethiopia (Fikrie and Andarge, 2021). These differences could stem from disparities in public health outreach programs and overall health literacy levels. Our findings also show that only 20.0% of participants recognised ageing as a cataract risk factor—far below the 78.9% reported in Cape Coast (Akowuah and Abdul-Sadik, 2018). Furthermore, our study found a significant relationship between religion and cataract awareness, with Muslims being more aware. This finding is uncommon, as previous studies have not reported similar associations (Shrestha and Shrestha, 2018, Yezinsh Addis Alimaw *et al*., 2019)and may reflect local sociocultural dynamics or religious group involvement in health outreach in Oforikrom.

Age-Related Macular Degeneration (AMD)

AMD had the lowest awareness (7.2%) and knowledge levels among all four conditions. These findings align with studies from Syria (4.0%) and China (6.8%) (Shamous *et al*., 2023, Zhang and Ma, 2017). Globally, AMD awareness remains low, even in high-income countries. According to the AMD Global Report, awareness levels are 30.0% in the United States, 25.0% in Canada, 16.0% in the United Kingdom, 14.0% in both South Africa and Germany, 13.0% in France, 11.0% in Ireland, and just 2.0% in Australia (Alliance, 2005), underscoring a critical global gap in eye health education. In our study, fewer than 2.0% of participants could identify AMD symptoms or risk factors. Family history, smoking, and high blood pressure were the most

recognised. Similarly, Shamous *et al*. (2022) also highlighted these as key risk factors. We found that regular eye examinations were positively associated with AMD awareness, suggesting that strengthening primary eye care services could play a vital role in bridging the awareness gap.

Sources of Information

Family and friends were the most common sources of information, followed by television and healthcare professionals. The dominance of informal sources may contribute to widespread misconceptions, particularly for conditions such as glaucoma and AMD. Furthermore, the low use of the internet and printed materials may indicate barriers such as digital illiteracy or restricted access to media in underserved communities.

A key strength of this study is that it provides novel, context-specific data on the awareness and knowledge of age-related eye conditions in Oforikrom, Ghana, an area with limited existing evidence. The community-based design, with participants recruited across multiple localities in Oforikrom, enhances the representativeness of the findings. Furthermore, the use of a pretested questionnaire ensured clarity and validity of responses. Importantly, the study highlights critical gaps in knowledge despite high awareness levels, making the findings highly relevant for informing public health education strategies and policy interventions. However, certain limitations should be noted. Explaining Age-Related Macular Degeneration (AMD) comprehensively in local dialects proved challenging, as the complexity of medical terminology and the absence of equivalent terms may have limited participants' full understanding, potentially affecting responses on AMD awareness and knowledge. Furthermore, the study focused exclusively on four age-related eye conditions: presbyopia, cataract, glaucoma, and AMD, while other vision-impairing conditions were not assessed. This limited scope may have constrained a more comprehensive evaluation of overall visual health awareness in the population. In addition, the study did not evaluate the effectiveness of any interventions aimed at improving awareness and knowledge. Future research should explore the impact of targeted health education programs to enhance understanding and promote early detection and management of eye conditions.

CONCLUSION

This study revealed high awareness of cataract and glaucoma but very low awareness of presbyopia and AMD among adults in Oforikrom, Ghana. Overall, participants had limited knowledge about the age-related eye conditions. The primary source of information was family and friends. Considering the reliance on informal sources of information and the widespread misconceptions, there is a crucial need for comprehensive public health education programs on eye health in the municipality.

Data availability

The data supporting the conclusion of this study are available from the corresponding author upon request.

Declarations

There is no conflict of interest associated with this article.

Funding

The authors have no funding to report.

Acknowledgments

The authors are very grateful to the Oforikrom Municipal Assembly and individuals in the Oforikrom municipality who took part in this study.

REFERENCES

ABERESE-AKO, M., IMMURANA, M., DALABA, M. A., ANUMU, F. E., OFOSU, A. & GYAPONG, M. 2023. An Ethnographic Study of Multiple Factors Influencing Perceptions, Attitudes, and Observance of COVID-19 Preventive Measures among Rural and Urban Slum Dwellers in Ghana. *Journal of Environmental and Public Health,* 2023.

AKOWUAH, A.-K. & ABDUL-SADIK, F. 2018. Knowledge about Cataract and its Risk Factors among an Adult Population in the Cape Coast Metropolis, Ghana. *Optometry: Open Access***,** 1-4.

ALEMU, D. S., GUDETA, A. D. & GEBRESELASSIE, K. L. 2017. Awareness and knowledge of glaucoma and associated factors among adults: a cross-sectional study in Gondar Town, Northwest Ethiopia. *BMC ophthalmology,* 17**,** 1-12.

ALLIANCE, A. 2005. Awareness of age-related macular degeneration and associated risk factors. *Toronto, AMD Alliance International*.

ASANTE, F., GUODAAR, L., NYAABA, E. & ADDAI, G. 2024. Gendered flood risk perception and mental health of urban households in Ghana: Insights from the Oforikrom municipality. *Environmental Challenges,* 15**,** 100921.

ASSI, L., CHAMSEDDINE, F., IBRAHIM, P., SABBAGH, H., ROSMAN, L., CONGDON, N., EVANS, J., RAMKE, J., KUPER, H. & BURTON, M. J. 2021. A global assessment of eye health and quality of life: a systematic review of systematic reviews. *JAMA ophthalmology,* 139**,** 526-541.

BECHANGE, S., JOLLEY, E., VIRENDRAKUMAR, B., PENTE, V., MILGATE, J. & SCHMIDT, E. 2020a. Strengths and weaknesses of eye care services in sub-Saharan Africa: a meta-synthesis of eye health system assessments. *BMC Health Services Research,* 20**,** 1-8.

BECHANGE, S., JOLLEY, E., VIRENDRAKUMAR, B., PENTE, V., MILGATE, J. & SCHMIDT, E. 2020b. Strengths and weaknesses of eye care services in sub-Saharan Africa: a meta-synthesis of eye health system assessments. *BMC Health Services Research,* 20**,** 1-8.

BOURNE, R. R., JONAS, J. B., BRON, A. M., CICINELLI, M. V., DAS, A., FLAXMAN, S. R., FRIEDMAN, D. S., KEEFFE, J. E., KEMPEN, J. H. & LEASHER, J. 2018. Prevalence and causes of vision loss in high-income countries and in Eastern and Central Europe in 2015: magnitude, temporal trends and projections. *British Journal of Ophthalmology,* 102**,** 575-585.

BOURNE, R. R., STEVENS, G. A., WHITE, R. A., SMITH, J. L., FLAXMAN, S. R., PRICE, H., JONAS, J. B., KEEFFE, J., LEASHER, J. & NAIDOO, K. 2013. Causes of vision loss worldwide, 1990–2010: a systematic analysis. *The lancet global health,* 1**,** e339-e349.

CAPÓ, H., EDMOND, J. C., ALABIAD, C. R., ROSS, A. G., WILLIAMS, B. K. & BRICEÑO, C. A. 2022. The importance of health literacy in addressing eye health and eye care disparities. *Ophthalmology,* 129**,** e137-e145.

CELEBI, A. R. C. 2018. Knowledge and awareness of glaucoma in subjects with glaucoma and their normal first-degree relatives. *Medical Hypothesis, Discovery and Innovation in Ophthalmology,* 7**,** 40.

DE-GAULLE, V. F. & DAKO-GYEKE, P. 2016. Glaucoma awareness, knowledge, perception of risk and eye screening behaviour among residents of Abokobi, Ghana. *BMC ophthalmology,* 16**,** 1-7.

DE CARVALHO CORDEIRO, T. D., SILVA, L. M., ARAUJO MONTEIRO, E., DE FARIAS PONTES, M. D. L., GOLGHETO CASEMIRO, F. & PARTEZANI RODRIGUES, R. A. 2021. Physiological changes in vision during aging: perceptions of older adults and healthcare providers. *Investigación y Educación en Enfermería,* 39.

FIKRIE, G. & ANDARGE, B. 2021. Knowledge about cataract and associated factors among adults in Yirgalem town, Sidama National Regional State, southern Ethiopia, 2020: a community based cross sectional study design *Knowledge about cataract and associated factors among adults in Yirgalem Town, Sidama National Regional State, Southern Ethiopia***,** 1-9.

GAJAPATI, C. V., PRADEEP, A., KAKHANDAKI, A., PRAVEENCHANDRA, R. & RAO, S. 2017. Awareness of presbyopia among rural female population in north karnataka. *Journal of clinical and diagnostic research: JCDR,* 11**,** NC01.

GHANA, C. P. D. 2021a. *OFORIKROM MUNICIPAL*

Municipal District in Ghana [Online]. citypopulation. Available: https://www.citypopulation.de/en/ghana/admin/ashanti/0640__oforikrom_municipal/ [Accessed 11 May, 2021].

GHANA, M. O. F. 2021b. *PROGRAMME BASED BUDGET ESTIMATES FOR 2021*

OFORIKROM MUNICIPAL ASSEMBLY [Online]. mofep. Available: https://mofep.gov.gh/sites/default/files/composite-budget/2021/AR/Oforikrom.pdf [Accessed 11 May, 2021].

GSS. 2021. *2021 Population and Housing Census: General Report Volumes 3A, 3B, and 3C* [Online]. Available: https://census2020.statsghana.gov.gh/presspage.php?Presentation-on-the-General-Report-Volumes-3A-3B-and-3C=&readmorenews=MTY4OTA1MDkwNC4wOTY%3D [Accessed 6th May 2025 2025].

HOEVENAARS, J. G., SCHOUTEN, J. S., VAN DEN BORNE, B., BECKERS, H. J. & WEBERS, C. A. 2006. Socioeconomic differences in glaucoma patients' knowledge, need for information and expectations of treatments. *Acta Ophthalmologica Scandinavica,* 84**,** 84-91.

HUTCHINS, B. & HUNTJENS, B. 2021. Patients' attitudes and beliefs to presbyopia and its correction. *Journal of Optometry,* 14**,** 127-132.

KAMIŃSKA, A., PINKAS, J., WRZEŚNIEWSKA-WAL, I., OSTROWSKI, J. & JANKOWSKI, M. 2023. Awareness of Common Eye Diseases and Their Risk Factors—A Nationwide Cross-Sectional Survey among Adults in Poland. *International Journal of Environmental Research and Public Health,* 20**,** 3594.

KATIBEH, M., ZIAEI, H., PANAH, E., MOEIN, H.-R., HOSSEINI, S., KALANTARION, M., ESKANDARI, A. & YASERI, M. 2014. Knowledge and awareness of age related eye diseases: a population-based survey. *Journal of ophthalmic & vision research,* 9**,** 223.

KAY, T., NAY, L., MOHAMAD, R., MARGARETH, W. & NEOH, P. 2017. Awareness of presbyopia and factors influencing its correction among local community in Sibu, Sarawak. *correction among local community in Sibu, Sarawak Kay TM, Nay L., Mohamad RBS, Margareth WAY, Neoh PS, Hazheem SBH, Randy OMH, Li Na.,* 2**,** 21.

KIZOR-AKARAIWE, N. N., MONYE, H. I. & OKEKE, S. 2017. Awareness and knowledge about glaucoma and proportion of people with glaucoma in an urban outreach programme in Southeast Nigeria. *BMJ open ophthalmology,* 1**,** e000018.

KODUAH, C., BUNCE, C. & GILBERT, C. 2019. Presbyopia and other eye conditions in teachers in Ghana. *International Journal of Environmental Research and Public Health,* 16**,** 3209.

KUMAH, D. B., LARTEY, S. Y. & AMOAH-DUAH, K. 2011. Presbyopia among public senior high school teachers in the Kumasi metropolis. *Ghana Med J,* 45**,** 27-30.

MAHARANA, P. K., RAI, V. G., PATTEBAHADUR, R., SINGHI, S. & CHAUHAN, A. K. 2017. Awareness and knowledge of glaucoma in central India: a hospital-based study. *The Asia-Pacific Journal of Ophthalmology,* 6**,** 243-249.

MBA, C. J. 2010. Population ageing in Ghana: research gaps and the way forward. *Journal of aging research,* 2010**,** 672157.

NKUM, G., LARTEY, S., FRIMPONG, C., MICAH, F. & NKUM, B. 2015. Awareness and knowledge of glaucoma among adult patients at the eye clinic of a teaching hospital. *Ghana medical journal,* 49**,** 195-199.

NUERTEY, B. D., AMISSAH-ARTHUR, K. N., ADDAI, J., ADONGO, V., NUERTEY, A. D., KABUTEY, C., MENSAH, I. A. & BIRITWUM, R. B. 2019. Prevalence, Causes, and Factors Associated with Visual Impairment and Blindness among Registered Pensioners in Ghana. *J Ophthalmol,* 2019**,** 1717464.

PALLERLA, S. R., KHANNA, R. C., SANNAPANENI, K. & KEEFFE, J. 2020. Public knowledge, attitudes and practices related to eye diseases in Southern Indian population. *Int J Community Med Public Health,* 7**,** 4993.

RAO, G. 2015. The Barrie Jones Lecture—eye care for the neglected population: challenges and solutions. *Eye,* 29**,** 30-45.

REWRI, P. & KAKKAR, M. 2014. Awareness, knowledge, and practice: a survey of glaucoma in north Indian rural residents. *Indian journal of ophthalmology,* 62**,** 482-486.

SATHYAMANGALAM, R. V., PAUL, P. G., GEORGE, R., BASKARAN, M., HEMAMALINI, A., MADAN, R. V., AUGUSTIAN, J., PREMA, R. & LINGAM, V. 2009. Determinants of glaucoma awareness and knowledge in urban Chennai. *Indian Journal of Ophthalmology,* 57**,** 355-360.

SERVICE, G. S. 2021. Ghana 2021 population and housing census. *Population of Regions and Districts*.

SHAMOUS, T., OBEID, K. & SALMAN, A. 2022. Knowledge and Awareness About Age-Related Macular Degeneration Among Students of The Syrian Private University.

SHAMOUS, T., OBEID, K. & SALMAN, A. 2023. Knowledge and Awareness About Age-Related Macular Degeneration Among Students of The Syrian Private University. *Journal of Veterinary Health Science,* 4**,** 26-34.

SHRESTHA, S. & SHRESTHA, S., SHRESTHA, MISHRA, JOSHI 2018. Awareness of Eye Health and Diseases among the Population of the Hilly Region of Nepal *jornal of ophthalmic and vision research***,** 461-469.

SINGH, S., SINGH, K., GUPTA, S. & SINGH, H. 2022. Awareness Regarding Presbyopia Among the Patients Presenting to Eye OPD at Tertiary Care CENTER. *International Journal of Health Sciences***,** 4642-4650.

YEZINSH ADDIS ALIMAW, Y. A. A., MOHAMMED SEID HUSSEN, M. S. H., TSEHAY KASSA TEFERA, T. K. T. & BETELHEM TEMESGEN YIBEKAL, B. T. Y. 2019. Knowledge about cataract and associated factors among adults in Gondar town, Northwest Ethiopia.

ZHANG, G.-M. & MA, X., YANG,CHEN 2017. Awareness of Age-related Macular Degeneration and Its Risk Factors among Beijing Residents in China. *chinese medical journal***,** 155-159.