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Determinants of health literacy among older adults in Saboba district in Ghana: a cross-sectional study

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Abstract

Background Patient health literacy (HL) is increasingly recognized as a critical factor affecting healthcare outcomes. People with inadequate or limited health literacy are more likely to misunderstand their disease and treatment, which subsequently leads to incorrect use of medications or failure to follow prescribed treatment regimens, resulting in poor outcomes. Therefore, this study assessed the level of health literacy, and the factors associated with health literacy among older adults in Saboba District in the northern region of Ghana.

Method An analytical quantitative cross-sectional design was used. The study participants (420) were selected through a multistage sampling technique. Data were collected using a structured questionnaire and analyzed with Stata Version 16.0. An adjusted odds ratio (AOR) with a 95% confidence interval (CI) was reported to indicate the presence of statistically significant factors associated with older adults' health literacy. Variables with p values less than 0.05 were considered significant.

Results The overall health literacy (HL) score was 15.34 ± 4.88. Among the health literacy domains, the healthcare HL domain had the highest mean score (16.78 ± 2.17), whereas the disease prevention HL domain had the lowest mean score (14.45 ± 4.38). Multiple linear regression analysis indicated that age, religion, and educational attainment were significant predictors of health literacy among elderly participants. Compared with those aged 65–69 years, participants aged 70–79 years presented a reduction in the general HL score of -0.87 units (95% CI: -1.54; -0.20, $p = 0.011$). Similarly, traditionalists had a -0.79-unit reduction in the HL score (95% CI: -1.47; -0.10, $p = 0.024$) compared with Christian participants. In contrast, significantly higher HL scores were observed among older adults with education levels of J.H.S. (β = 4.08, 95% CI: 2.87; 5.29), S.H.S. (β = 7.72, 95% CI: 5.90; 9.54), and tertiary (β = 10.79, 95% CI: 8.75; 9.54) than among those with no formal education.

Conclusions The study found that overall health literacy levels among older adults in the Saboba district were suboptimal. Age, religious affiliation, and educational attainment were significant predictors of higher health literacy scores. These findings underscore the need for sustained, targeted interventions aimed at improving health literacy among older populations, particularly in underserved rural settings.

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Keywords Health literacy, Healthcare, Health promotion, Disease prevention, Adults, SABOBA district, Northern region

Background

Health literacy is an important topic in today's healthcare environment, especially for elderly people [1]. The ability to obtain, understand, and use fundamental health information and services to safeguard health, enhance health, and treat impairments is referred to as health literacy [2]. Health literacy is an umbrella of challenging reading, listening, and comprehension skills; analytical and decision-making abilities; and the capacity to use these abilities in health-related situations [3]. A low level of literacy leads to a weakness in the ability to understand health information, difficulties in fulfilling processes and instructions, and problems with the ineffective use of health services [4]. Low levels of health literacy are more common among persons who are older, less educated, impoverished, from minorities, and who have trouble speaking the language of the nation of residence [5].

Furthermore, dementia risk is greater for people with poor health literacy [6]. This has been confirmed by [7], who reported that age-related declines in cognitive performance are linked to greater despair, deterioration of physical health, and a decline in health literacy. It has also been reported that health literacy is attributed to low social status, low educational and income levels, poor health conditions, limited activity secondary to health problems, an older population, and ethnic origin [8–10].

A study in Europe revealed variations between countries and indicated that some groups within countries are less literate in matters of health [11]. For example, in Germany, a study of the literacy level of the population revealed that 66% of those above 65 years of age and 80% of those over 76 years of age had limited health literacy [12]. A study in Turkey reported inadequate health literacy among 85.1% of the older groups [3].

The low level of health literacy among adults has led to 60% of care experience, 35% of hospitalization, and 47% of hospital delays among this group [13]. Hence, older persons are more likely to experience a mismatch between their daily difficulties and the competencies required to manage their health [14], particularly those from poorer social classes, who are at greater risk of having poor health literacy [11].

Ghana is one of the countries in sub-Saharan Africa, is experiencing rapid growth in its elderly population [15]. According to Knoema's World Datahub, the proportion of individuals aged 65 years and has risen from 2.5% in 1972 to 3.2% in 2021, reflecting at an average annual rate of 0.51% [16]. This demographic shift presents significant challenges, as older adults in Ghana often face age-related degenerative conditions that impair physical and cognitive functioning [17]. Consequently, adequate health literacy—defined as the ability to access, understand, and apply health information—is critical for elderly individuals to navigate healthcare systems, manage chronic conditions, and mitigate risks such as poverty, social neglect, and exclusion.

Despite the growing elderly population, there is limited research on health literacy levels among older adults in Ghana, particularly in rural and underserved regions like the Saboba District in the Northern Region [18]. Low health literacy rates may exacerbate existing health disparities, leading to poor health outcomes and increased vulnerability among this population group. Therefore, this study seeks to assess the health literacy rate and its determinants among older adults in the Saboba District, providing crucial insights to inform targeted interventions and policies aimed at improving elderly healthcare access and well-being.

Methods and materials

Study location and design

Saboba is a predominantly rural district located in the Northern Region of Ghana. The district was purposively selected for this study due to several contextual factors relevant to the research objectives. Saboba has limited access to specialized health services and has experienced a growing trend of return migration of many retirees relocating from urban areas. Additionally, preliminary evidence suggests low utilization of preventive health services and inadequate dissemination of health information—factors directly pertinent to the study's focus on health literacy in marginalized communities [19]. According to the 2022 population estimates, Saboba had a total population of 84,317, with males comprising 49.2% and females 50.8% of the population [20]. This study employed a quantitative cross-sectional design to determine the factors associated with health literacy among older adults.

Population and sampling

The target population for this study was persons aged 65 years and above living in Saboba District. The eligibility criteria included individuals aged ≥ 65 years, those who had stayed in the district for 3 or more months, those who agreed to be part of the study, and those who signed informed consent forms. Persons who were severely ill were excluded from this study.

Four hundred and twenty (420) adults ≥ 65 years were recruited for this study. The sample size was determined

via Yamane's formula for population-based sample size determination [21]. The stated formula is as follows:

$n = N/1 + N (e)^2$.

where n = the sample size of the total population.

N = Population size.

e = Margin of error.

The population for older adults (65+) in Soboba was estimated at 2235 based on the Ghana Statistical Services projections [20]. The margin of error, which was represented as (e), was estimated at 0.05. Substituting these values yielded a sample of 400; however, a nonresponse rate of 5% was added, which resulted in the current sample size.

A multistage sampling approach was used to select participants. Firstly, thirty communities within the district were randomly selected. The number of participants recruited from each community was determined using proportional allocation based on estimated community size. Given the absence of a sampling frame, a random walk sampling technique was implemented. Data collectors began at the centre of each selected community, identifying the first housing unit by moving clockwise. From this initial unit, they proceed in a specified direction to identify subsequent housing units. In each housing unit, the first encountered elderly person (aged 65 and above) was recruited. If no eligible adult was found, data collectors moved to the next household, repeating this process until a targeted adult was located.

Data collection tools and procedure

Two final-year public health students from the Fred Newton Binka School of Public Health who were completing their internships in the Zubzugu and Saboba districts were recruited and trained as data collectors. Prior to data collection, the questionnaire was pretested to ensure consistency and validity. The questionnaire included an adapted version of the 12-item Health Literacy Questionnaire (HL-SF12) by Van Duong et al. (2017) to measure health literacy, along with a sociodemographic questionnaire [22]. The HL-SF12 assesses health literacy across three domains, namely, healthcare, disease prevention, and health promotion, in addition to a composite score for overall (general) health literacy. Each domain consists of four items, with reliability coefficients of 0.81 for healthcare, 0.82 for disease prevention, and 0.76 for health promotion. The health literacy domains covered various topics, such as understanding information about treatments, interpreting medication leaflets, evaluating treatment options, calling an ambulance in emergencies, managing mental health issues (e.g., stress or depression), understanding the importance of health screenings and vaccinations, following preventive health advice, engaging in activities for mental well-being, interpreting media health messages, maintaining health-related behaviours, and participating in physical activities such as sports or exercise classes.

Each task was rated on a 4-point Likert scale, where 1 indicated "very difficult," 2 "difficult," 3 "easy," and 4 "very easy." Data collection was conducted through one-on-one interviews at participants' residences. Before each interview, the participants signed a consent form after the data collectors explained the study's objectives. The interviews lasted approximately 30–40 min.

Data analysis

Data analysis was conducted with Stata version 16.0 to generate descriptive and inferential statistics. Descriptive statistics, including frequencies and percentages, are presented for categorical variables in tabular form, whereas means and standard deviations describe participant characteristics.

The perceived difficulty of each health literacy item was rated on a 4-point Likert scale, with scores ranging from 1 ("very difficult") to 4 ("very easy").

The overall/general health literacy (GHL) index for the 12 items of the HL-SF12 questionnaire was calculated via a standardized metric ranging from 0 to 50, with the following formula: (M– 1) * (50/3), where M is the mean of all participating items for everyone (M ranging from 1 to 4), where 1 is the minimal possible value of the mean and 4 is the maximum of the mean, 3 is the range of the mean, and 50 is the chosen maximum value of the desired scale. This calculation was also applied to each of the three subdomains: healthcare, disease prevention and health promotion. A score of 0 represented the lowest possible HL score, and 50 represented the highest.

Linear regression analysis was used to examine associations between the dependent variable (general health literacy score) and independent variables, including age, marital status, religion, education level, socioeconomic status, occupation, household type, activity level, and noncommunicable disease (NCD) status.

All variables with a significance level less than 5% in univariate analyses were included in a multivariable linear regression model to identify key predictors of health literacy. Statistical significance was set at a p value < 0.05. The mean variance inflation factor (VIF) was calculated at 1.56, indicating that there were no multicollinearity concerns. However, robust standard errors were applied to the multi linear regression model, as the Breusch–Pagan–Cook–Weisberg test indicated heteroscedasticity ($p < 0.001$).

Ethical issues

The study adhered strictly to all the ethical guidelines and regulations regarding the use of human subjects in Ghana. This study was reviewed and approved by the Research Ethics Committee of the University of Health

and Allied Sciences with protocol number UHAS-REC B.10 (212) 21–22. Written informed consent was obtained from all participants prior to data collection. Only adults aged 65 years and above who were deemed capable of providing consent were enrolled in the study.

Results

Background characteristics of the study participants

The results indicated that more of the participants were female (51.4%), nearly four in ten participants (39.8%) were between 70 and 79 years old, and more than half of them (58.8%) were married. Four of the ten participants (46.2%) professed Christianity, a majority (57.1%) of them had no formal education, and 66.2% were farmers. The majority (92.1%) of the participants lived with their children or grandchildren. More than half (52.1%) of the participants lived in households with 6–10 members, and 43.3% were within the low socioeconomic class. More than half of the participants (51.4%) reported that they had a noncommunicable disease. A third (37.1%) of the participants were moderately physically active (Table 1).

Health literacy levels of the participants

Table 2 presents the overall health literacy scores and scores across various HL subdomains among elderly participants in Soboba. The results indicate that the disease prevention HL subdomain had the lowest average score (14.45 ± 4.38), whereas the healthcare HL subdomain had the highest score (16.79 ± 2.17). The overall HL score for the participants was 15.34 ± 4.88.

Factors associated with high general health literacy

In the crude analysis, general health literacy was significantly associated with age, educational level, marital status, socioeconomic status, religion, ethnicity, and activity level. For example, being single (β = -2.51, 95% CI: -3.39; -1.63) was negatively associated with HL, whereas having tertiary education (β = 12.29, 95% CI: 11.28; 13.31) was positively associated with HL. Additionally, being 90 + years (β = -4.22, 95% CI: -6.35; -2.10) was negatively associated with HL, whereas being retired was positively associated with HL (β = 4.37, 95% CI: 3.40; 5.34). In the adjusted analysis, general health literacy was significantly associated with age, religion and educational level. For example, being between 70 and 79 years (β = -0.87, 95% CI: 1.63; -0.11) and being a traditionalist (β = -0.79, 95% CI: -1.29; -0.28) were negatively associated with HL. However, having junior high (β = 4.08, 95% CI: 2.87; 5.29), senior high (β = 7.72, 95% CI: 5.90; 9.54) or tertiary education (β = 10.79, 95% CI: 8.75; 9.54) was positively associated with HL (Table 3).

Discussions

The study revealed that only 15.34% of Ghana's elderly population exhibited high general health literacy levels-a prevalence substantially lower than the 81.8% reported in similar studies from other regions [23]. This discrepancy aligns with findings from Germany and Italy [24, 25], suggesting that health literacy disparities among older adults persist across diverse geographical contexts. Additionally, the mean healthcare literacy score (16.79 ± 2.17) was markedly lower than those documented in Taiwan and Vietnam [26, 27] and other geriatric-focused studies [28–31], reinforcing concerns about systemic gaps in health education and access, particularly in low-resource settings.

Globally, an estimated 90% of individuals lack the necessary knowledge and skills to effectively prevent and manage health conditions, with older adults disproportionately affected [32, 33]. In Ghana, this disparity is exacerbated by structural healthcare barriers, including: Inadequate patient education from providers, prolonged waiting times and financial constraints, limited geriatric care infrastructure, restricting exposure to essential health information [34]. Such systemic challenges perpetuate low health literacy and compound existing health inequities.

Beyond structural factors, negative healthcare experiences—such as perceived disrespect or stigmatization by medical staff—further deter elderly individuals from seeking care, particularly in resource-limited settings [34]. These encounters not only reduce healthcare utilization but also deepen health literacy disparities among aging populations.

The low disease prevention health literacy score (14.45 ± 4.38), in contrast with the high health care health literacy score (16.79 ± 2.17), highlights an important concern. Given the critical role of health literacy in the success of public health interventions, these findings suggest that existing public health initiatives in Ghana may be less effective among elderly individuals. This calls for strategic adaptations in public health approaches to better engage and benefit this vulnerable population.

The study identified age, religious affiliation and educational level as key determinants of health literacy among Ghanaian elderly individuals. Age emerged as a significant factor influencing health literacy, which is consistent with studies conducted in other parts of the world [35–37]. Age-related physical and cognitive challenges, such as vision or hearing impairments and cognitive decline, likely contribute to these disparities. These findings could also explain why aging was significantly associated with health literacy among the participants in this study. These findings emphasize the need for age-specific interventions to mitigate the effects of aging on health literacy.

Table 1 Background characteristics of the participants

Variable	Frequency ($n=420$)	Percentage (%)
Sex		
Male	204	48.6
Female	216	51.4
Age		
65–69	112	26.67
70–79	167	39.76
80–89	121	28.81
90+	20	4.76
Marital status		
Married	247	58.81
Single	173	41.19
Religion		
Christian	194	46.19
Islamic	44	10.48
Traditionalist	182	43.33
Ethnicity		
Konkomba	320	76.19
Mole-Dagbani	36	8.57
Moshies	47	11.19
Akan/Ewe	17	4.05
Educational level attained		
None	240	57.14
Primary	64	15.24
Junior High School	53	12.62
Senior High School	31	7.38
Tertiary	32	7.62
Occupation		
Farmer	278	66.19
Artisan	38	9.05
Retired/Unemployed	104	24.76
Live with		
Live with someone about the same age	33	7.86
Live with children and/or grandchildren	387	92.14
Number of people in household.		
< 5	71	16.90
6–10	219	52.14
11–15	94	22.38
16–20	24	5.71
Had Non-Communicable Disease		
No	204	48.57
Yes	216	51.43
Physical activity level		
Less active	126	30.00
Moderately active	156	37.14
Very Active	138	32.86
Socioeconomic status		
Low class	182	43.33
Middle class	161	38.10
High class	77	18.57

Table 2 Health literacy levels of the participants

Variable/HI Domains	Mean ± SD	Median	Inter-Quarter Range
General HL	15.34 ± 4.88	12.5	12.5-15.63
Disease Prevention HL.	14.45 ± 4.38	12.5	12.5–12.5
Healthcare HL.	16.79 ± 2.17	12.5	12.5-18.75
Health promotion HL.	14.77 ± 4.36	12.5	12.5-15.63

Table 3 Factors associated with health literacy among the elderly in Saboba district

Variable	Unadjusted		Adjusted	
	B (95% CI)	*p* value	B (95% CI)	*p* value
Age				
65–69	Ref.		Ref.	
70–79	-2.40 (-3.47; -1.34)	< 0.001 ***	-0.87 (-1.54; -0.20)	0.011 *
80–89	-3.8 (-4.95; -2.65)	< 0.001 ***	-0.61 (-1.45; 0.23)	0.154
90+	-4.22 (-6.35; -2.10)	< 0.001 ***	-0.63 (-2.17; 0.98)	0.425
Marital status				
Married	Ref.		Ref.	
Single	-2.51 (-3.39; -1.63)	< 0.001 ***	-0.10 (-0.75; 0.55)	0.760
Religion				
Christianity	Ref.		Ref.	
Islamic	-1.67 (-3.09; -0.26)	0.021**	-0.69 (-1.62; 0.25)	0.150
Traditionalist	-3.89 (-4.77; -3.02)	< 0.001 ***	-0.79 (-1.47; -0.10)	0.024 *
Educational level				
No formal education	Ref.		Ref.	
Primary	1.03 (0.27; 1.79)	0.008**	0.80 (-0.01; 1.61)	0.054
J. H. S	4.50 (3.68; 5.32)	< 0.001 ***	4.08 (3.17; 4.98)	< 0.001 ***
S. H. S	8.60 (7.58; 9.64)	< 0.001 ***	7.72 (6.59; 8.85)	< 0.001 ***
Tertiary	12.29 (11.28; 13.31)	< 0.001 ***	10.79 (9.49; 12.08)	< 0.001 ***
Ethnicity				
Konkomba	Ref.		Ref.	
Mole-Dagbani	2.54 (0.94; 4.15)	0.002		
Moshies	0.26 (-1.17; 1.68)	0.724		
Akan/Ewe	1.22 (-1.05; 3.49)	0.291		
Occupation				
Farmers	Ref.		Ref.	
Artisan	1.79 (0.32; 3.35)	0.017*	-0.30 (-1.31; 0.71)	0.561
Retired/Unemployed	4.37 (3.40; 5.34)	< 0.001 ***	0.76 (-0.02; 1.54)	0.057
Household composition				
Living alone	Ref.		Ref.	
With someone of the same age	-4.53 (-10.10; 1.04)	0.110		
With children/grandchildren	-3.57 (-8.90; 1.76)	0.189		
NCD status				
No	Ref.		Ref.	
Yes	-0.27 (-1.17; 0.63)	0.562		
Activity level				
Less active	Ref.		Ref.	
Moderately active	0.59 (-0.46; 1.63)	0.271	0.20 (-0.46; 0.86)	0.556
Highly active	3.51 (2.44; 4.59)	< 0.001	0.76 (-0.01; 1.47)	0.051
Socio-Economic status				
Low	Ref.		Ref.	
Middle class	-1.24 (-2.22; -0.27)	0.012	0.48 (-0.13; 1.08)	0.122
High	-3.09 (-4.30; -1.88)	< 0.001	0.09 (-0.70; 0.87)	0.826

Significant at *$P < 0.05$, **$p < 0.01$, $p < 0.001$; B = regression coefficient; CI = confidence interval

Ref.; Reference

Educational level was another significant determinant, which aligns with studies conducted in the Netherlands and China [38, 39]. The findings highlight that higher educational attainment is associated with better health literacy, although other studies suggest that cognitive decline can partially mediate this relationship [40, 41]. This highlights the importance of lifelong learning and tailored educational interventions for older adults to sustain and enhance health literacy. Moreover, the study underscores existing evidence of low educational attainment among older adults in Ghana, with nearly 60% reporting no formal education [42]. This disparity reflects historical inequities in access to education and the continued marginalization of older populations in educational interventions [42]. Despite years of adult literacy initiatives, the persistence of low literacy levels among older adults suggests that current strategies may be inadequate [43]. These findings highlight the urgent need for a re-evaluation of policies and the development of more targeted and functional literacy programs tailored to the needs of the aging population in Ghana.

Given that Saboba is an underserved rural setting, the findings align with existing research indicating that health literacy rates tend to be lower in rural areas compared to urban counterparts [44, 45]. For instance, older adults residing in urban Ghana have been shown to exhibit significantly higher levels of health literacy than those in rural areas [45]. This disparity is compounded by several structural challenges faced by the elderly in rural Ghana, including limited access to accurate health information, financial constraints, long waiting times in health facilities, and often unmet expectations regarding health worker communication and support. These factors underscore the need for targeted interventions to improve health literacy and healthcare access in underserved communities [34].

Religious affiliation and many other factors are associated with health literacy, as shown in previous studies from the United States and other regions [46–55]. Religious groups often shape health behaviors through structured activities, orientations and norms, which can either support or hinder health literacy. This finding suggests that leveraging religious organizations and leaders could be an effective strategy for promoting health literacy within faith-based communities.

Taken together, the results of this study have important implications for public health policy and practice in Ghana. Tailored health promotion initiatives targeting the elderly should address key determinants such as age, education, and socioeconomic status. Policymakers should consider leveraging religious and community networks to deliver culturally relevant health literacy programs. Furthermore, enhancing social capital and creating opportunities for lifelong learning could mitigate the negative effects of aging and socioeconomic disparities on health literacy.

Institutional reforms are also needed to ensure that public health initiatives are inclusive and accessible to older populations. Future research should explore innovative strategies to improve health literacy among elderly individuals, such as integrating technology, community-based interventions, and intergenerational learning programs. Additionally, longitudinal studies are needed to understand the long-term impact of health literacy interventions on health outcomes in older adults.

By addressing these determinants through evidence-based policies and practices, Ghana can empower its elderly population with the knowledge and skills necessary to lead healthier and more informed lives.

Study limitations

An important limitation of this study is that the health literacy (HL) questionnaire used had not undergone formal validation within the Ghanaian context. As a result, there is some uncertainty regarding whether the questionnaire adequately captured and measured the concept of health literacy, which may have influenced the findings. Nevertheless, the use of this research instrument in a similar setting, combined with the statistical strength of our final regression model, suggests that the instrument was appropriate and that the results are reliable. Another limitation of this study is the age criterion used to define the elderly population. Participants were sampled from 65 years and above, which may not fully capture the broader elderly population group in Ghana, where the official definition of old age begins at 60 years. As such, the findings may not be entirely generalizable to the entire elderly population.

Despite these limitations, the study makes a significant contribution to the existing health literacy literature in Ghana, particularly among the elderly population in an underserved setting, and provides valuable insights for the subregion.

Conclusions

This study revealed that overall health literacy levels among older adults in the Saboba district were suboptimal. In addition, the study identified age, religious affiliation, and educational attainment as key determinants of higher health literacy. These findings highlight critical areas for intervention to address low health literacy among the elderly population particularly in underserved rural settings in Ghana.

To improve health literacy outcomes, policymakers should leverage religious and community networks to deliver culturally relevant and context-specific health literacy programs. Additionally, institutional reforms are needed to ensure that public health initiatives are

inclusive, accessible, and tailored to meet the unique needs of older populations. By addressing these determinants, health literacy among the elderly can be enhanced, ultimately improving health outcomes and quality of life.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12889-025-23500-x.

Supplementary Material 1

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Author contributions
BA and GA conceptualized the study, BA coordinated the data collection, UVG analysed the data, BA and PKA wrote the initial draft, GAA drafted the discussion, EAA and GAA review the initial draft. All authors reviewed and approved the final draft.

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Data availability
The dataset supporting the conclusions of this article is included within the article as additional file 1.

Declarations

Human ethics and consent to participate
The study adhered strictly to ethical guidelines in the use of human subjects. The study design received approval from University of Health and Allied Sciences Research Ethics Committee with a reference number UHAS-REC B.10 (212) 21–22. Informed and written consents were obtained from participants prior to data collection.

Competing interests
The authors declare no competing interests.

Clinical trial number
Not applicable.

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