



Original Article

# Social and Behavioral Factors Associated with Health Literacy Among Older Adults in a Ward of Urban Vietnam: Implications for Community-Based Health Promotion

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## Abstract

**Introduction:** Health literacy (HL) is an important determinant of health outcomes, particularly among older adults who often experience cognitive decline and limited access to health information. In Vietnam, evidence on HL and its social and behavioral determinants among urban older populations remains limited. This study assessed the prevalence of HL and associated factors among older adults in Hanoi.

**Methods:** A cross-sectional survey was conducted among 168 adults aged  $\geq 60$  years in Tay Mo ward, Hanoi, using door-to-door convenience sampling. Data were collected using a structured questionnaire covering socio-demographic characteristics, social support, and health behaviors. HL was measured using the 12-item HLS-SF12, standardized to a 0–50 index and categorized as inadequate ( $\leq 33$ ) or adequate (34–50). Descriptive statistics, chi-square tests, and logistic regression analyses were performed.

**Results:** Overall, 79.2% of participants had inadequate HL. Inadequacy was most common in the health care (70.8%) and disease-prevention (67.9%) domains, and least common in health promotion (51.2%). Higher education was associated with adequate HL ( $OR = 2.35$ ;  $P = 0.03$ ). Several behavioral factors were positively associated with adequate HL, including frequent social activities, access to health communication, social media use, and sports participation. In multivariable analysis, social media use ( $OR = 2.90$ ;  $P = 0.03$ ) and sports participation ( $OR = 5.75$ ;  $P = 0.006$ ) remained significant predictors.

**Conclusion:** Most urban older adults in Hanoi had inadequate health literacy. Social media use and physical activity were key predictors of adequate HL, highlighting the potential of community-based and digital health-promotion strategies to support healthy ageing in Vietnam.

**Keywords:** Health literacy, Older adults, Social determinants, Behavioral factors, Health promotion, Vietnam

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## Introduction

Health literacy (HL) is defined as people's knowledge, motivation, and competences to access, understand, appraise, and apply health information for decisions in health care, disease prevention, and health promotion throughout the life course.<sup>1</sup> Health literacy (HL) is a key determinant of health outcomes, affecting individuals' ability to navigate health systems and manage illness. Limited HL is associated with poor treatment adherence, reduced use of preventive services, and higher hospitalization rates. Beyond cognitive skills, HL is now recognized as a social and behavioral construct that shapes everyday health decisions and self-care through interactions with the social environment, partly by influencing health behaviors such as physical activity, diet, and help-seeking.<sup>2</sup>

Older adults are especially vulnerable to low health literacy due to age-related changes and life-course factors. Cognitive aging can impair the ability to process and

remember new medical information, and sensory deficits (e.g. poorer vision or hearing) further complicate health communication.<sup>3</sup> Moreover, older generations often have lower formal education levels - a major determinant of health literacy<sup>4</sup> - and may be less familiar with digital information sources. For example, seniors with limited HL are significantly less likely to use the Internet to obtain health information than those with adequate HL, reflecting a persistent digital divide.<sup>5</sup> Recent studies across diverse settings confirm that older adults' HL correlates strongly with socioeconomic factors, health behaviors, and social support. Lower educational attainment and income are associated with poorer HL,<sup>4</sup> and low HL in this age group is tied to unhealthy behaviors (such as physical inactivity and suboptimal diet) as well as difficulty managing illness.<sup>6</sup> Psychosocial factors such as loneliness, perceived control, and community participation have also emerged as important correlates of HL, suggesting that improving HL requires attention to social connectedness and



empowerment among older adults. In addition, social and family support play an important role in enabling seniors to access and understand health information.<sup>7</sup> Older adults with stronger support networks tend to have better HL, though this effect may diminish in the most advanced ages.<sup>7</sup> Together, these factors underscore why many older people struggle with health information: worldwide, an estimated majority of adults over 60 have limited health literacy, with studies reporting between about 27% and 92% of older populations having inadequate HL.<sup>3</sup>

By 2050, about 80% of the world's older people will be living in low- and middle-income countries,<sup>8</sup> where health systems often struggle to meet their complex needs. Vietnam exemplifies this trend. The country is aging quickly – as of 2025, approximately 16% of Vietnam's population is 60 years or older – and it is projected to reach “aged society” status by 2038.<sup>9</sup> Although older adults in urban areas such as Hanoi have better physical access to healthcare facilities, many still struggle to navigate complex health systems and understand health information, particularly when HL is limited. Rapid urbanization and changes in family structure and lifestyle further shape how urban seniors access and use health information, making them a relevant group for HL research. However, evidence on HL among older adults in Vietnam remains scarce; until recently, few studies quantified HL in this population, and almost none focused on urban settings. A recent study in central Vietnam reported that nearly 60% of older adults had inadequate general HL,<sup>10</sup> yet the role of social and behavioral determinants—such as education, social support, and daily health practices—among urban older adults remains insufficiently explored.

Given this context, the current study was conducted to assess the level of health literacy and to identify associated socio-demographic and behavioral factors among older adults living in an urban ward of Hanoi, Vietnam. The findings are expected to fill an important knowledge gap and inform targeted health promotion strategies for healthy aging in urban Vietnamese contexts. By highlighting social and behavioral determinants, this study aims to provide insights for designing community-based interventions that strengthen health literacy and promote healthy aging in urban settings.

## Methods

### Participants and Procedures

The a cross-sectional study was conducted among older adults aged over 60 years old living in Tay Mo ward, Nam Tu Liem district, Ha Noi, Vietnam. Participants were adults aged  $\geq 60$  years who had resided in the study area for at least one year, were mentally alert, in stable health, and able to communicate and respond to questions. Individuals who were absent during data collection, had communication or memory impairments, were unable to provide responses, or had symptoms or diagnoses of

psychiatric disorders were excluded. The required sample size for this study was calculated using the formula for estimating a proportion in a cross-sectional design, yielding a minimum of 159 participants. In practice, a total of 168 older adults were enrolled. A convenience sampling approach was applied, following the “door-to-door” method in households with older adults residing in Tay Mo ward, until the required sample size was achieved according to the inclusion criteria. The study protocol was approved by the relevant institutional ethical review board. All the study participants in the study were asked for their consent before collecting data, and all were informed of their complete right to withdraw from the study at any time without any negative consequences or disadvantages.

### Data Collection and Measures

Data were collected using a structured questionnaire developed based on a theoretical framework and by referencing instruments previously applied in related studies. The questionnaire was piloted and refined before being used in the main survey. It comprised four main sections:

1. General demographic information of older adults.
2. Social and family support for information access.
3. Health literacy assessment: measured using the HLS-SF12 questionnaire, which has demonstrated high reliability (Cronbach's alpha = 0.85).<sup>11</sup> This instrument consists of 12 items rated on a 4-point scale (from very easy to very difficult) across three domains of health literacy—health care, disease prevention, and health promotion—with four items allocated to each domain.

4. Daily living and lifestyle behaviors.

Health literacy was the dependent variable, assessed using the 12-item HLS-SF12 scale, with each item rated on a 4-point scale (1 = very difficult to 4 = very easy). The overall score was standardized to a 0–50 index using the formula  $(\text{mean} - 1) \times (50/3)$  following the European health literacy standardization approach,<sup>12</sup> and categorized as inadequate ( $\leq 33$ ) or adequate (34–50). Independent variables included demographic characteristics, family and social support, and lifestyle/behavioral factors. In this study, behaviors were classified as frequent if performed  $\geq 2$  times per week and less frequent if performed  $\leq 1$  time per week.

### Data Analysis

Data analysis was carried out using SPSS 26 Software. Frequencies and percentages were used to describe the categorical variables; Chi-square test was used to examine the univariate association between health literacy and related factors. Multivariable logistic regression analysis was conducted to assess the association between health literacy and related factors after adjusting for potential confounders.

## Results

### Characteristics of the Study Participants

Of 168 eligible older adults approached, all consented and were included (response rate 100%). Females accounted for 76.8% of the sample, nearly three times the proportion of males (23.2%). The participants' ages ranged from 60 to 84 years, with a mean of 67 years. The largest group was those aged 65–74 years (44.0%), while only 13.7% were 75 years and above. Most participants had completed lower secondary education (32.7%), and only 1.2% had attained postgraduate education. The majority were farmers (41.1%) or retired (38.7%). Most were married (91.1%), and only 8.9% had never married. In terms of income, 64.3% earned under 3 million VND per month, 26.8% earned 3–5 million, and only 8.9% earned more than 5 million.

### Prevalence of Health Literacy Among Older Adults

Overall, the findings revealed substantial challenges in functional and interactive health literacy among older people, particularly in understanding and evaluating health information. Table 1 summarizes the health literacy capacities of older adults across three domains: health care, disease prevention, and health promotion. In the health care domain, the ability to seek information about treatment methods was the easiest task (50.6% easy and 7.1% very easy), while the greatest difficulty was reported in assessing treatment options (21.4% very difficult and 38.1% difficult). Understanding medicine leaflets and calling an ambulance were also challenging, with around half of participants reporting difficulties.

In the disease prevention domain, understanding the

importance of health check-ups was the easiest (58.3% easy and 11.9% very easy), and more than half also found it easy to make protective decisions based on advice from family or friends. By contrast, assessing vaccination needs was the most difficult (20.8% very difficult and 41.1% difficult), while the ability to seek information on managing health problems was divided nearly equally between easy and difficult.

In the health promotion domain, more than half of participants rated tasks as easy or very easy. The highest proportion was observed in self-assessing daily health-related behaviors (60.1% easy and 13.1% very easy). The greatest difficulty was reported in understanding health communication messages (26.2% difficult and 15.5% very difficult).

Figure 1 shows that the majority of older adults had

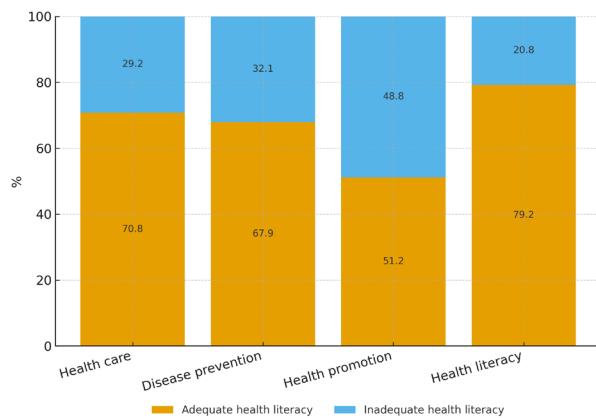


Figure 1. Health literacy status among older adults

Table 1. Health literacy capacity of older adults across three domains: Health care, disease prevention, and health promotion

Health literacy capacity	Difficulty level			
	Very difficult n (%)	Difficult n (%)	Easy n (%)	Very easy n (%)
<b>Health care capacity</b>				
Seeking information about treatment methods	36 (21.4)	35 (20.8)	85 (50.6)	12 (7.1)
Understanding medicine leaflets	31 (18.5)	55 (32.7)	78 (46.4)	4 (2.4)
Assessing advantages/disadvantages of treatment options	36 (21.4)	64 (38.1)	60 (35.7)	8 (4.8)
Calling an ambulance in emergencies	35 (20.8)	55 (32.7)	60 (35.7)	18 (10.7)
<b>Disease prevention capacity</b>				
Seeking information on managing health problems	26 (15.5)	60 (35.7)	75 (44.6)	7 (4.2)
Understanding why health check-ups are needed	19 (11.3)	31 (18.5)	98 (58.3)	20 (11.9)
Assessing vaccination needs	35 (20.8)	69 (41.1)	58 (34.5)	6 (3.6)
Deciding how to protect against illness based on advice from family/friends	26 (15.5)	51 (30.4)	80 (47.6)	11 (6.5)
<b>Health promotion capacity</b>				
Learning about activities beneficial for health and mental well-being	25 (14.9)	26 (15.5)	87 (51.8)	30 (17.9)
Understanding communication messages about healthy living	26 (15.5)	44 (26.2)	84 (50.0)	14 (8.3)
Assessing daily health-related behaviors	16 (9.5)	29 (17.3)	101 (60.1)	22 (13.1)
Participating in sports clubs or exercise classes	26 (15.5)	41 (24.4)	73 (53.5)	28 (16.7)

inadequate health literacy, with overall inadequacy at 79.2%. The highest inadequacy was in general health literacy, while the lowest was in health promotion literacy (51.2%). Inadequate health care and disease prevention literacy were 70.8% and 67.9%, respectively.

### Factors Associated with Health Literacy

Given that HL is shaped by both social and behavioral influences, the following analysis explored how education, daily activities, social engagement, and lifestyle behaviors

were associated with health literacy among older adults.

Table 2 shows a significant association between educational attainment and health literacy. Older adults with at least upper secondary education were 2.35 times more likely to have adequate health literacy compared to those with lower secondary education or below, with the difference being statistically significant ( $P=0.03$ ). Older adults who frequently performed housework were more likely to have adequate health literacy compared to those less frequently engaged ( $OR=2.46$ ; 95% CI: 1.04–5.81;

**Table 2.** Factors Associated with health literacy

	Inadequate HL		Adequate HL		OR (95% CI)	P
	n	%	n	%		
<b>Socio-demographic characteristics</b>						
<b>Age</b>						
≥65	81	83.5	16	16.5	1	0.11
<65	52	73.2	19	26.8	1.85 (0.87-3.92)	
<b>Sex</b>						
Male	30	76.9	9	23.1	1	-
Female	103	79.8	26	20.2	0.84 (0.36 – 1.99)	0.69
<b>Married Status</b>						
Married/Living with a partner	120	78.4	33	21.6	1	-
Never married	13	86.7	2	13.3	0.56 (0.12 – 2.6)	0.45
<b>Education</b>						
≤Lower secondary	69	86.2	11	13.8	1	-
≥Upper secondary	64	72.7	24	27.3	<b>2.35 (1.07 – 5.19)</b>	<b>0.03*</b>
<b>Household economic status</b>						
Low income	86	79.6	22	20.4	1	-
Average	36	80.0	9	20.0	0.98 (0.41 – 2.33)	0.96
High	11	73.3	4	26.7	1.42 (0.41 – 4.89)	0.58
<b>Daily activities and social support</b>						
<b>Housework participation</b>						
Less frequent	56	87.5	8	12.5	1	0.037
Frequent	77	74.0	27	26.0	<b>2.46 (1.04-5.81)</b>	
<b>Social activities</b>						
Less frequent	111	86.0	18	14.0	1	0.000
Frequent	22	56.4	17	43.6	<b>4.77 (2.13-10.66)</b>	
<b>Access to health communication</b>						
Less frequent	88	87.1	13	12.9	1	0.002
Frequent	45	67.2	22	32.8	<b>3.31 (1.53-7.18)</b>	
<b>Use of social media</b>						
Less frequent	82	90.1	9	9.9	1	0.000
Frequent	51	66.2	26	33.8	<b>4.65 (2.02-10.70)</b>	
<b>Sports participation</b>						
Less frequent	67	94.4	4	5.6	1	0.000
Frequent	66	68.0	31	32.0	<b>7.87 (2.63-23.53)</b>	
<b>Family/social support</b>						
Less frequent	122	80.8	29	19.2	1	0.121
Frequent	11	64.7	6	35.3	2.3 (0.78-6.72)	

The bold numbers indicate statistically significant results with  $P<0.05$ .

$P=0.037$ ). Frequent participation in social activities was strongly associated with adequate health literacy ( $OR=4.77$ ; 95% CI: 2.13–10.66;  $P<0.001$ ). Regular access to health communication activities also increased the likelihood of adequate health literacy ( $OR=3.31$ ; 95% CI: 1.53–7.18;  $P=0.002$ ). Frequent social media use was significantly associated with adequate health literacy ( $OR=4.65$ ; 95% CI: 2.02–10.70;  $P<0.001$ ). Older adults who played sports regularly were nearly six times more likely to have adequate health literacy ( $OR=7.87$ ; 95% CI: 2.63–23.53;  $P<0.001$ ). Receiving frequent family/social support was associated with higher odds of adequate health literacy ( $OR=2.30$ ; 95% CI: 0.78–6.72), but the association was not statistically significant ( $P>0.05$ ).

Table 3 presents the multivariate analysis of health literacy among older adults. Two factors remained statistically significant: frequent social media use ( $OR=2.90$ ; 95% CI: 1.11–7.54;  $P=0.03$ ) and frequent sports participation ( $OR=5.75$ ; 95% CI: 1.65–20.11;  $P=0.006$ ). Other factors such as education, housework, social activities, health communication access, and family/social support were not statistically significant in the adjusted model. These findings suggest that behavioral engagement and digital connectedness play a crucial role in promoting HL, potentially mediating the effects of traditional socio-demographic factors like education.

## Discussion

The present study provides important insights into the health literacy (HL) status of older adults living in an urban ward of Hanoi, Vietnam. Our findings show that nearly four out of five participants had inadequate HL, with especially low performance in the domains of health care and disease prevention. These results align with growing global evidence that HL remains a critical challenge in older populations, even in urban contexts where health care infrastructure is relatively more accessible.<sup>13,14</sup> This reinforces the notion that improving HL in older age requires not only informational access but also supportive social and behavioral environments that facilitate learning, motivation, and self-care.

## Prevalence of inadequate health literacy

The prevalence of inadequate HL in our study (79.2%) is higher than recent estimates in high-income countries. A previous study in Taiwan reports that more than half (57.6%) of their participants had limited HL,<sup>15</sup> whereas a recent U.S. survey estimated around 36% of older adults had limited HL.<sup>16</sup> The much higher proportion in Hanoi highlights persistent disparities between low- and middle-income countries (LMICs) and high-income settings. Such differences may stem not only from education or economic gaps but also from variations in social support systems, communication practices, and digital exposure that influence how older adults access and interpret health information in Vietnam, our findings are consistent with a 2025 cross-sectional survey conducted in Da Nang which found that only 39.7% of older adults had adequate health literacy.<sup>10</sup> The similarity reinforces the representativeness of our findings and confirms HL as a pressing issue in Vietnam's aging population.

Domain-specific results showed inadequacy was highest in health care (70.8%) and disease prevention (67.9%), and lowest in health promotion (51.2%). Similar trends were observed in recent studies from China and Japan, where older adults often reported greater difficulty with interpreting medical instructions and preventive services compared with everyday health promotion tasks.<sup>17,18</sup> The relatively better performance in health promotion tasks in our study may reflect the influence of community-based health education and peer learning, which often rely on interpersonal and social channels familiar to older adults.

## Factors Associated with health literacy

In the adjusted model, only two modifiable behaviors—frequent social media use and regular sports participation—remained independently associated with adequate health literacy (HL), whereas education, social participation, family support, and exposure to health communication were attenuated. These findings highlight pragmatic levers for HL improvement in urban older adults.

The observed association between social media use and adequate HL is consistent with evidence linking older adults' online information-seeking and health-

**Table 3.** Multivariate logistic analysis of factors associated with health literacy

Characteristics	B	S.E	Wald	p	OR	95% CI
Age<65	0.46	0.46	1.00	0.32	1.59	0.64
Education≥Upper secondary	0.25	0.47	0.28	0.59	1.28	0.51
Frequent housework	0.2	0.51	0.15	0.70	1.22	0.45
Frequent social activities	0.68	0.48	2.03	0.16	1.98	0.77
Frequent access to health communication	0.48	0.47	1.02	0.31	1.61	0.64
Frequent use of social media	1.06	0.49	4.76	<b>0.03</b>	<b>2.90</b>	<b>1.11</b>
Frequent sports participation	1.75	0.64	7.51	<b>0.006</b>	<b>5.75</b>	<b>1.65</b>
Frequent family/social support	1.18	0.68	2.98	0.08	3.24	0.85

The bold numbers indicate statistically significant results with  $P<0.05$ .

related interaction to higher eHealth literacy.<sup>19</sup> Digital connectedness may reduce informational barriers, enhance peer learning, and strengthen self-efficacy, highlighting the social dimension of HL. Similarly, the independent association between sports participation and adequate HL aligns with studies showing reciprocal links between HL, digital HL, and physical activity.<sup>20</sup> Physical activity may enhance cognitive function, self-efficacy, and social connectedness, while exercise groups also provide informal settings for peer exchange and collective health literacy.

That education was significant in bivariate analysis but not after adjustment may reflect shared variance with digital engagement and structured activity—behaviors themselves patterned by schooling. Prior Vietnamese and regional work consistently shows education as a key determinant of HL, so attenuation here likely indicates mediation rather than absence of effect.<sup>11</sup> This suggests that behavioral engagement may partly compensate for limited formal education, underscoring the importance of lifelong learning and active participation in maintaining health literacy in older age.

### Implications for health promotion and practice

Inadequate HL among urban older adults hinders preventive care participation<sup>21</sup> and increases healthcare costs.<sup>22,23</sup> As our findings link adequate HL with social media use and exercise, interventions should combine digital literacy workshops with community-based physical activities. Specifically for Vietnam, we recommend integrating age-friendly HL screening into primary care and blending traditional communication channels with guided digital approaches. This strategy addresses inequalities by treating HL as a social practice rather than merely an individual skill.

### Strengths and limitations

This study's strengths include the use of the validated HLS-SF12 instrument adapted for Vietnam<sup>12</sup> and its focus on modifiable social and behavioral determinants of health literacy, providing practical implications for community-based interventions. However, the use of convenience sampling in a single urban ward introduces selection bias, with a predominantly female sample, limiting representativeness and generalizability, particularly to older males. Future studies using probability-based sampling across diverse urban and rural settings with balanced gender representation are warranted.

### Future Directions

Future studies should employ longitudinal and intervention designs to clarify causal pathways and assess strategies to improve health literacy. Expanding research to rural and peri-urban settings, and examining gender differences, intergenerational support, and digital inclusion, would

provide a more comprehensive understanding of health literacy among older adults in Vietnam. Qualitative research is also needed to explore older adults' lived experiences with health information in daily life.

### Conclusion

This study reveals a high prevalence (79.2%) of limited health literacy (HL) among urban older adults in Hanoi, particularly in healthcare and prevention domains. Frequent social media use and regular exercise were identified as key predictors of adequate HL. Consequently, Vietnam's healthy-aging strategies should integrate primary care HL screening with interventions that combine digital literacy training and community-based physical activity to enhance health outcomes and equity.

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### Authors' Contribution

**Conceptualization:** Luu TKO.

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**Formal analysis:** Vu TH.

**Methodology:** Hua TT, Ha TMN.

**Project administration:** Luu TKO, Nguyen TQ.

**Visualization:** Luu TKO, Hua TT.

**Writing – original draft:** Luu TKO.

**Writing – review & editing:** Ha TMN, Vu TH, Luu TKO.

### Competing Interests

The authors declared no potential conflicts of interest concerning this article research, authorship, and/or publication.

### Ethical Approval

The study protocol was approved by the Scientific and Ethical Committee in Biomedical Research, Hanoi University of Public Health (No. 56/2023/YTCC-HD3, dated 10/02/2023). All participants provided informed consent prior to data collection and were informed of their right to withdraw from the study at any time without any negative consequences.

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