




Health Literacy of Newly-Admitted Cancer Patients in Vietnam: Difficulties Understanding Treatment Options and Processing Health-Related Information

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ABSTRACT: Having a good understanding of cancer patients' health literacy in the early stage of diagnosis can help to implement strategies to improve the management process and overall health outcomes. The study aims to describe health literacy and its association with socio-demographic characteristics among newly admitted cancer patients. A cross-sectional study was conducted on 262 newly admitted patients of a cancer hospital in Vietnam using the Vietnamese version of the HLS-SF12 questionnaire. Descriptive analytics and regression analysis were used to describe health literacy and examine associated factors. Older age, lower level of education, and living in rural areas were associated with lower health literacy while there was no significant relationship between gender and health literacy among newly admitted cancer patients. Many newly admitted patients, especially the older patients have difficulties understanding the different treatment options (54%) and evaluating the reliability of health information on the internet (43%). During the early stage of treatment, strategies should be implemented with regards to patients' health literacy, to properly educate patients and their caregivers to improve communication, adherence to medication, lifestyle, and overall better quality of life and treatment outcome.

KEYWORDS: Health literacy, cancer, newly admitted patient, Vietnam

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Introduction

Health literacy is a concept that was first introduced in 1974.¹ As researches concerning this subject gained attention over the years, the definition for this term had evolved to multiple definitions regarding different approaches.^{2–6} World Health Organization defined health literacy as “the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health.”⁵

In patients with cancer, health literacy is important for its relationship to the prevention and the treatment of the disease as it can be considered either a risk factor or an asset of the patient.² Health literacy has been found to have an indirect influence on the quality of life of breast cancer patients through depression and anxiety.⁷ Low health literacy has been found to have a connection with poorer adherence to medications⁸ and difficulty in communication with health care staff⁹ in patients with chronic conditions. There is a significant relationship between health literacy and cancer self-management behaviors as well as their related outcomes.¹⁰ Low health literacy also interferes with cancer prevention as it influences screening in multiple ways,¹¹ leading to diagnosis at a later stage.¹² Regarding communication, there often is a mismatch in the information provided and the information the patients with low health literacy received and applied.^{11,13,14}

There are several tools developed to measure general health literacy like the Health Literacy Questionnaire (HLQ), the European Health Literacy Survey (HLS-EU), and the 12 items Short Form Health Literacy Instrument (HLS-SF12) derived from the HLS-EU was validated in Vietnam.^{15–19} Aside from general health literacy measurements, cancer-oriented health literacy measuring instruments have also been developed to address more specific issues, like the Cancer Health Literacy Tests (CHLT): CHLT-30 and the CHLT-6.^{20,21}

There have been multiple research on health literacy in different groups of cancer patients. Multiple studies have shown that there are a considerable, and variable proportion of patients with inadequate or low health literacy, during multiple stages of treatment.^{22–27} Two studies from Halverson,^{26,27} on 2 population-based samples of cancer patients in Wisconsin showed a relatively high number of patients with inadequate health literacy 24.2% low on 1 study and 56.2% in the other. A longitudinal study of Halbach et al^{22,23} displayed health literacy of breast cancer patients after breast surgery, with the proportion of patients with limited health literacy during the hospital stay and 40 weeks after are 47% and 49% in one of the studies and 48.2% and 50.5% in the other. Another research also showed a low level of health literacy among prostate cancer patients.²⁵

Health literacy on newly admitted cancer patients at diagnosis could be crucial, since the level of health literacy at the



time of diagnosis could influence the patient's decision on the choice of treatment methods and timing of the treatment.^{25,28-31} Also, determining health literacy in this group of patients could be useful for adjusting and implementing early patient education strategies, leading to better management of the disease over the course of treatment and related health outcomes. Despite this, health literacy of newly admitted cancer patients prior to receiving definitive treatment hasn't been researched too often. However, the study from Halbach et al²² on newly diagnosed breast cancer patients with data collected in the postoperative hospital stay should provide relatable information on the health literacy of newly admitted patients in Germany. There have also been some findings on the quality of life in this group of patients.^{32,33} Understanding health literacy in newly admitted cancer patients, prior to treatment is important, especially in the context of a developing country like Vietnam, where the burden of non-communicable diseases like cancer has been increasing. From 1990 to 2018, the number of new cancer cases has tripled.³⁴

In this study, we aim to describe the level of general health literacy and analyze its association with the characteristics of newly admitted cancer patients, prior to treatment in a cancer hospital in Vietnam.

Materials and Methods

Study setting

This study was conducted in the Hanoi Oncology Hospital, Hanoi, Vietnam. The majority of the hospital population was from Hanoi (about 8 million inhabitants in 2019) and nearby provinces. The hospital has 615 inpatient beds. In 2019, the hospital had 120 770 patient visits, 55 232 inpatient-day, and 65 538 outpatients. This is one of the first-level hospitals that can receive patients from all provinces of the country.

Study design

The study is a cross-sectional study with data collected from interviewer-administered surveys and from hospital records.

Study subjects and sample

The sample included 262 patients who were admitted for the first time and less than a week, at the time of diagnosis, prior to receiving definitive treatment in the Hanoi Oncology Hospital from July to September in 2019. The study excluded patients who were unable to answer due to physical or mental impairments, or did not agree to participate in the study.

Instruments and key variables

Patients were interviewed with an instrument consisted of 2 parts: (1) Demographic background: The questionnaire included name, gender, age, education, occupation, living areas (urban/rural); (2) The 12 item Short Form Health Literacy

Instrument (HLS-SF12). The HLS-SF12 instrument was translated into Vietnamese and validated.^{15,16} The HLS-SF12 measure health literacy on 3 dimensions: health care, disease prevention, and health promotion; on the different levels of health literacy including finding, understanding, evaluating information, and make health-related decisions and taking actions.^{15,16} It consists of 12 items accessing general health literacy on 3 dimensions: 4 items on health care, 4 items on disease prevention, and 4 items on health promotion. For each item, the respondent's answer could be 1="very difficult"; 2="somewhat difficult"; 3="easy"; 4="very easy." The total score ranged from 0 to 50, the higher the score, the better the health literacy.

Data collection process

The data extracted from hospital records included patient ID, name, gender, birth, and diagnosis. Data was collected from interviewer-administered surveys using the study instruments. The interviewers were 4 medical students in their second, third, and fifth year and were trained for data collection by the research group before the study. Each day the research team collected information about newly admitted patients of the hospital from the Consultation Department. An interview plan then was made for the following days. Based on the plan, the interviewers visited the patients' room and interviewed after getting the patient consent. The interviews were performed within the first week of patients' admission. The HL-SF12 questionnaire was administered with the interviewer emphasizing on the different levels of activities regarding health literacy in each question (to find, to understand, to judge/evaluate, and to make health-related decisions). The interviews were done in the patient room or anywhere in the hospital providing that the selected patients felt comfortable and nothing interfered with the interview.

Data management and statistical analysis

Epidata 4.0 was used to store interviewed data. Completed questionnaires were cleaned before entering Epidata software. Check file was used to control for logical errors that may occur during data entry and interview. Data on some background information of patients extracted from hospital records then was merged with interview data using the Patient's ID. STATA version 15.1 was used to analyze data and RStudio 1.3.1 was used to plot figures.

The 4 outcome variables: general health literacy, health care, disease prevention, and health promotion score were normally distributed. Therefore, the two-sample *t*-test for mean comparison and the ANOVA analysis of variance and a posthoc analysis using Bonferroni adjustment was used to compare the HLS-SF12 scores between each patient group. Multiple linear regression was used to determine the relationship between patients' characteristics and HLS-SF12 scores. Dummy coding was used for independent

categorical variables in the regression model. Residual versus fitted values analysis and skewness and kurtosis tests for normality were used to check the assumption of the model. We did not notice any specific pattern on the residual-fitted values analysis and the skewness and kurtosis tests showed the normality of the distribution of the HLS-SF12 scores.

Ethical clearance

The research was granted ethical clearance from The Ethical Committee of the Hanoi Oncological hospital decision number: 32/CN-HĐĐĐ at 28/03/2019. All study subjects were informed about the objective of the study and their right to refuse to do the interview or stop the interview at any point of the interview or skip any questions that may make them uncomfortable.

Results

Sample characteristics

Table 1 describes the general characteristics of the sample population. Of the 262 patients studied, 69.1% of which were female. Considering age, a major part of the sample fell within 45 to 59 years old (43.5%). Most patients lived in rural areas (71.8%) and 42.7% had secondary education, only 37.4% had completed high school and less than half of them settle for further education. Regarding occupation, 44.7% of the sample were farmers, 10.7% were office staff, 11.1% do business and services while 33.6% were self-employed or doing other jobs. Most patients were of the head and neck cancer disease category (60.7%), 18.3% were of gastrointestinal cancer, and 12.2% were of gynecological and breast cancer only 3.1% were of other cancer categories that included urological cancer, skin, and soft tissues cancer. There is a significant difference in level of education between occupation group, and education, occupation among with living areas ($P < .05$). About 56% of patients from urban areas completed high school education or higher while this number in rural areas was only 29.9%. Regarding occupation, in rural areas, more than half (56.9%) of the occupation was farmers only 27.1% was office staff; while in urban areas 50% were office staff and 20% have an occupation in business and services. The majority of farmers (86%) only has an education of secondary school or under, while more than 90% of people who do business and services has further education. About 75% of office staff completed high school or further education. There is so a significant difference in the level of education between age group, as more than 70% of patients aged 45 to 70 didn't receive high school education, while this number are 49% in the 35 to 44 years old group and 22.9% in the 16 to 34 years old group ($P < .05$)

Distribution of answers to the 12 items of the HL-SF12

Figure 1 described the distribution of answers to each HL-SF12 item. In the sample, regarding the healthcare aspect of health literacy, 54% of patients had difficulties *judging the advantages*

Table 1. General characteristics of the study participants.

VARIABLES	N	%
Gender		
Male	81	30.9
Female	181	69.1
Age group		
16-34	35	13.4
35-44	57	21.8
45-59	114	43.5
60-70	56	21.4
Living areas		
Urban	74	28.2
Rural	188	71.8
Education		
Primary education and under	52	19.8
Secondary education	112	42.7
High school education	57	21.8
Further education	41	15.6
Occupation		
Farmer	117	44.7
Office staff	28	10.7
Business and services	29	11.1
Self-employment and other occupations	88	33.6
Disease category		
Head and neck cancer	159	60.7
Gastrointestinal cancer	48	18.3
Gynecological and breast cancer	32	12.2
Lung cancer	15	5.7
Others categories	8	3.1

and disadvantages of different treatment options and 45% had difficulties *following instructions on medication*. Concerning the disease-prevention dimension, more than 40% of patients felt "Difficult" or "Very difficult" *to find information on how to manage mental health* and *to judge if the information in the media on health risks is reliable*.

Figure 2 described the distribution of answers to each HL-SF12 item by age group. Regarding age groups, older patient groups (44-59 and 60-70 years old) had more difficulties finding, understanding, and judging health-related information in comparison to the younger ones (16-34 and 35-44). About 53% of patients aged 44 to 59 and 45% of patients aged 60 to 70 found it's difficult *finding information on how to*

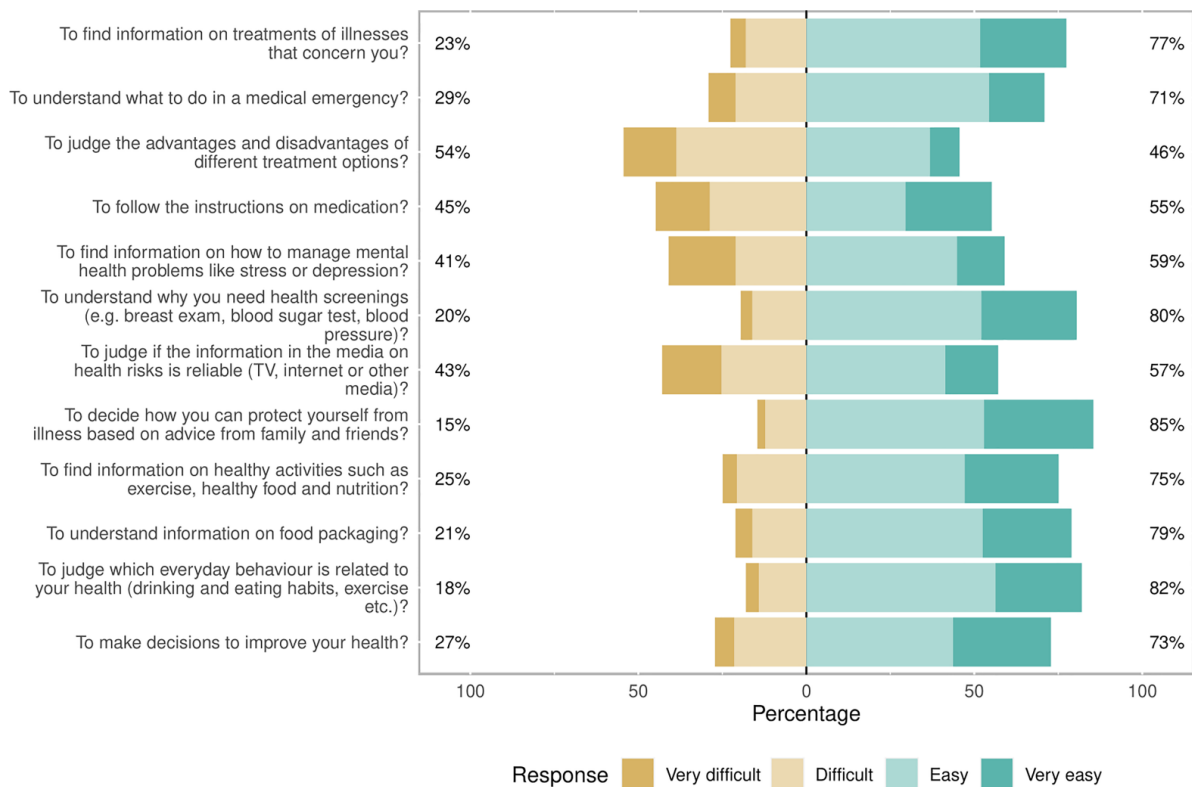


Figure 1. Distribution of answers to each HL-SF12 item.

manage mental health while in contrast, only 23% and 25% of patients aged 16 to 34 and 34 to 44 respectively had the same problem. Similarly, older patients also found it harder to *find information on the treatment of the illness* (27% and 30% compared to 6% and 16%), *to judge the advantages and disadvantages of treatment options* (62% and 59% compared to 37% and 45%) and *understand what to do in a medical emergency* (40% and 39% compared to 9% and 9%).

Table 2 describes the mean scores of HLS-SF12 in different groups of patients.

The mean health literacy scores of the study population were: 30.8 ± 8.9 for general health literacy, 28.4 ± 10.3 for health care, 30.5 ± 9.7 for disease prevention, and 33.4 ± 10.3 for health promotion. There was a difference in the mean score of all 4 health literacy score indexes: general health literacy, health care, disease prevention, and health promotion between age groups, different living areas, education levels, and occupations. Patients who lived in urban areas had higher health literacy scores than those who lived in rural areas. Regarding the age group, the 4 health literacy scores were highest in younger patients aged from 16 to 34. Bonferroni pairwise comparison of HLS-SF12 scores showed that there is a significant differences between 2 age groups: 16 to 44 and 45 to 70 ($P < .05$), while having no significant differences between 16 to 34 and 35 to 44, 45 to 59 and 60 to 70 ($P > .05$). Regarding education, there was no differences in health literacy between those with primary and secondary education, but are significantly higher in those with high school and further education, according to the Bonferroni test. Considering occupation, regarding general

health literacy and its 3 components, the office staff had the highest scores whereas farmers had the lowest scores ($P < .05$). There is no significant difference in health literacy scores between business and services and self-employment and other occupation ($P > .05$), and this group of occupation have higher scores than farmers and lower scores than office staff ($P < .05$), consistently across general health literacy and its 3 dimensions. Between the 2 genders, there was only a difference in the mean score of the disease prevention index but there was no difference in general health literacy.

Factors associated with health literacy

Table 3 display the multiple linear regression results of health literacy scores in association with socio-demographic characteristics of newly admitted patients. The residual versus fitted values analysis of the 3 models showed no specific pattern. The adjusted R^2 values for the models are: .1771 for general health literacy, .1633 for health care, .1083 for health promotion, and .1362 for disease prevention.

The regression model showed that there was a significant correlation between age and health literacy as patients aged 45 to 59 had significantly lower health literacy scores in all health literacy indexes ($P < .05$). Patients in the age group of 60 to 70 years old had lower scores in general health literacy, health care, and disease prevention ($P < .05$), but not health promotion. The model also showed that the general health literacy score, health promotion and disease prevention scores of people living in rural areas were lower than that of people who lived in

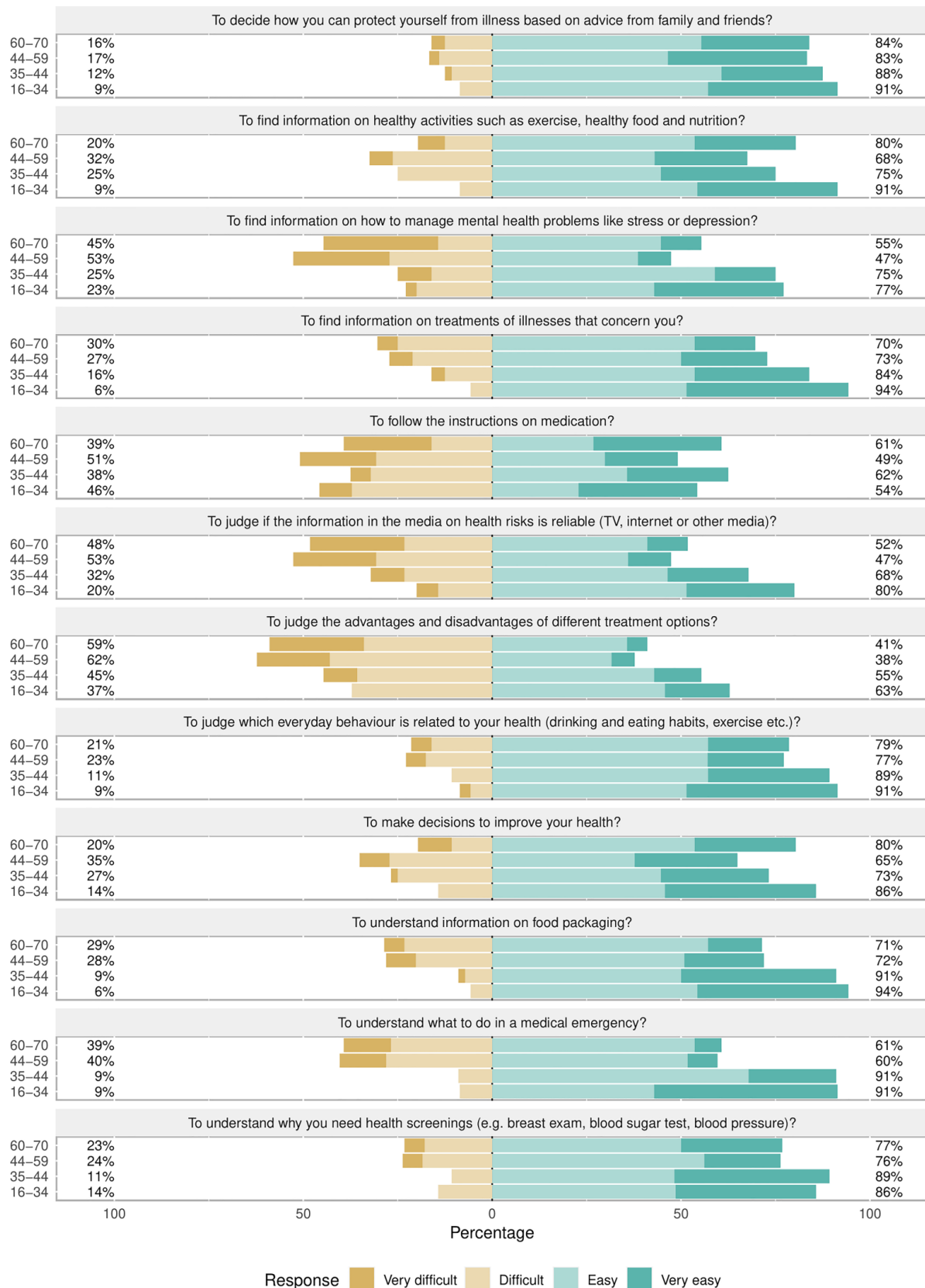


Figure 2. Distribution of answers to each HL-SF12 item by age groups.

urban areas (Coef: -3.16 ; $P < .05$). However, there was no association found between gender and health literacy in any of the outcome variables. On the other hand, education had a significant correlation with health literacy as people who completed

high school had higher general health literacy, health care while people who went for further education had better health promotion. However, there was no significance in disease prevention scores between the education levels.

Table 2. Mean scores and comparison of HLS-SF12 in different patient groups.

VARIABLES	GENERAL HEALTH LITERACY (MEAN ± SD)	HEALTH CARE (MEAN ± SD)	DISEASE PREVENTION (MEAN ± SD)	HEALTH PROMOTION (MEAN ± SD)	P-VALUE
Gender					
Male	29.4 ± 8.8	27.4 ± 9.6	29 ± 9.7	32 ± 11.1	^c
Female	31.3 ± 8.9	28.9 ± 10.5	31.1 ± 9.6	34 ± 9.9	
Age group					
16-34	36.3 ± 8.7	34.8 ± 9.4	35.8 ± 10.4	38.2 ± 9.2	a,b,c,d
35-44	34 ± 7.9	32.2 ± 9.3	33.8 ± 8.6	36 ± 9.7	
45-59	28.4 ± 8.5	25.7 ± 10.1	28.2 ± 9.1	31.1 ± 10.3	
60-70	28.9 ± 8.3	26.2 ± 9.4	28.3 ± 9.3	32.2 ± 10.1	
Living areas					
Urban areas	33.8 ± 8	30.8 ± 9.8	33.7 ± 9.3	36.8 ± 8.7	a,b,c,d
Rural areas	29.6 ± 8.9	27.5 ± 10.3	29.2 ± 9.6	32 ± 10.6	
Education					
Primary education and under	27.8 ± 8.7	25.6 ± 10.5	27.4 ± 9.2	30.4 ± 10.3	a,b,c,d
Secondary education	28.7 ± 7.9	25.7 ± 9.1	28.9 ± 8.8	31.5 ± 10.3	
High school education	32.9 ± 8.3	31.4 ± 9.7	32.2 ± 9.1	35.3 ± 9	
Further education	37.1 ± 8.8	35.5 ± 9.5	36.3 ± 10.9	39.5 ± 9.1	
Occupation					
Farmer	27.4 ± 8.7	25.2 ± 10	27.3 ± 9.3	29.6 ± 10.9	a,b,c,d
Office staff	38.6 ± 9.1	37.4 ± 9.3	37.1 ± 11.5	41.4 ± 8.6	
Business and services	32.6 ± 7.9	30.2 ± 10	31.3 ± 9	36.4 ± 9.1	
Self-employment and other occupations	32.2 ± 7.1	29.4 ± 9	32.3 ± 8.3	34.8 ± 8.1	
Disease category					
Head and neck cancer	31.5 ± 8.9	28.8 ± 10.8	31.6 ± 9.6	34.1 ± 9.7	^c
Gastrointestinal cancer	28.8 ± 9.5	26.7 ± 9.5	27.6 ± 9.6	31.9 ± 13.1	
Gynecological cancer	32.7 ± 8.2	31 ± 10.3	32.2 ± 9.7	35 ± 9.1	
Lung cancer	27.5 ± 6.1	26.7 ± 5.9	28.1 ± 8.5	27.8 ± 7.5	
Others categories	26 ± 6.9	24.5 ± 9.8	22.4 ± 6.3	31.3 ± 9.7	
Total	30.8 ± 8.9	28.4 ± 10.3	30.5 ± 9.7	33.4 ± 10.3	

t-Test was used for mean comparison of HLS-SF12 score for binary independent variables (gender, living areas).

Oneway ANOVA was used for mean comparison of HLS-SF12 score for independent variable with more than 2 categories (age group, education, occupation, and disease category).

P-value results for the *t*-test/ANOVA for the dependant variables are displayed as:

^aMean comparison of general health literacy using *t*-test/ANOVA is significant with *P*-value <.05.

^bMean comparison of health care literacy using *t*-test/ANOVA is significant with *P*-value <.05.

^cMean comparison of disease prevention literacy using *t*-test/ANOVA is significant with *P*-value <.05.

^dMean comparison of health promotion literacy using *t*-test/ANOVA is significant with *P*-value <.05.

Table 3. Multiple linear regression models for health literacy scores and socio-demographic characteristics of newly admitted patients.

	GENERAL HEALTH LITERACY		HEALTH CARE		HEALTH PROMOTION		DISEASE PREVENTION	
	COEF.	P-VALUE	COEF.	P-VALUE	COEF.	P-VALUE	COEF.	P-VALUE
Age groups								
16-34	reference		reference		reference		reference	
35-44	-1.21	.496	-1.16	.576	-1.19	.578	-1.28	.518
45-59	-5.72	.001	-6.37	.002	-4.74	.026	-6.06	.002
60-70	-5.22	.008	-6.02	.009	-3.71	.117	-5.95	.007
Living areas								
Urban	reference		reference		reference		reference	
Rural	-3.16	.007	-1.96	.151	-3.65	.01	-3.85	.004
Gender								
Male	reference		reference		reference		reference	
Female	-0.41	.719	-1.26	.34	-0.01	.996	0.05	.971
Education								
Primary education and under	reference		reference		reference		reference	
Secondary education	0.22	.872	-0.58	.717	0.54	.746	0.71	.644
Highschool education	3.36	.040	4.25	.026	3.22	.102	2.59	.156
Further education	4.85	.016	5.58	.017	5.22	.031	3.74	.094
Adjusted R ²	.1771		.1633		.1083		.1362	

Discussion

Health literacy is extremely important to cancer patients as it influences the entire process of cancer care: from prevention to early diagnosis, adherence and adaptation to treatment, coping with cancer-related symptoms, and overall improving quality of life in any stage of the disease.

In the newly admitted patient, we found that there was a significant relationship between age and health literacy as the younger the patient was, the better were the health literacy, even after adjusting for gender, education, and living areas. This finding is consistent with many prior studies.³⁵⁻⁴⁰ Our result showed that age seemed to influence health literacy negatively in all 3 dimensions: health care, health promotion, and disease prevention. It can be seen from the result that older patients have more problems in finding information on managing mental health. We also found that older patients had more difficulties finding, understanding and judging information that is necessary for making clinical-related decisions like: *what to do in a medical emergency*, or *finding information on the treatment of and judging the advantages and disadvantages of different treatment options* as well as *judging if the information in the media on health risks is reliable*. Additionally, in our results, the reduction of health literacy that comes with age seemed to heavily shift from a threshold, as there is a significant difference between patients aged 45 to 70 and 16 to 44, while this difference is insignificant

between component groups. At the moment, there haven't been a definitive explanation for the association between health literacy and age, despite strong correlation between cognitive function and health literacy, as suggested in multiple studies.^{36,39-43} Other than cognition, the decrease in functional health literacy in older adults can also be explained by visual impairments related to aging, frequency of reading, and even mental health as suggested from some research.^{36,40} Multiple studies shared a similar result that, even after adjusting for cognitive function, reading ability, and frequency, the relationship between age and health literacy is still significant.^{36,40,44,45} We also hypothesized that a potential unobserved mediator for the relationship between age and the measurement of health literacy is the accessibility and familiarity with the use of the internet and the media, as older people tends to use internet and social media not as often.^{46,47} The reduction in functional health literacy and internet-related information could be the explanation for the non-linear decrease in health literacy in regard to age, as found in our result.

Regarding gender, we found that there was no significant difference between male and female patients. A study conducted by Ehmann in Germany, 2020 also shared the same result.⁴⁸ However, the association between gender and health literacy is not the same in different settings.³⁸ A systematic review on the health literacy of heart failure patients showed

that in 2 high-quality studies, females tend to have higher health literacy than males, and gender remained a significant predictor even after adjusting for other demographic characteristics and cognitive function^{38,49,50}; however, in another 4 sets of studies, there was no association found between gender and health literacy.⁵¹⁻⁵⁴

Education is a major factor associated with health literacy, as found in most studies on health literacy.^{26,28,55-58} Those who have higher education levels should be more likely to have better ability to find, understand the health problems, symptoms. In our results, while the level of health literacy was significantly higher in those with highschool education or further, while there was no differences in those with lower education from secondary to primary and under. This could implies that in Vietnam, high school education is an important foundation for developing health literacy of an individual and highschool education could be an important stage where people develop the fundamental for a good health literacy.

The difference in urbanicity was also associated with health literacy, according to our study, which shared the same results with multiple studies, including a systematic review.^{26,35,55,56,59,60} In the systematic review by Aljassim and Ostini,⁵⁵ the author suggested that the gap in health literacy between urban and rural areas is bigger in developing countries, compared to that of developed countries. The explanation for the effect of urbanicity on health literacy is similar in multiple studies, as it is mostly mediated by major rural-urban differences, including education, income differences, occupation, ethnicity.^{26,55,56,60}

Overall, in our study, a lot of newly admitted patients (43%), especially older ones, had difficulties in determining the reliability of the information on the internet. Misinformation on the internet is a growing concern, especially in cancer care.⁶¹⁻⁶⁴ Inability to evaluate the reliability of health-related information can be dangerous as misinformation can potentially result in patients' improper treatment decisions, poor adherence to medication and increased morbidity.^{61,65} In response to this problem, during the entire treatment process and especially in the early stage, having good communication and trust between doctor and patient, as well as having properly-designed education materials distributed to patients are crucial to prevent and correct the misinformation early.^{61,66} Additionally, 41% of newly admitted cancer patients have trouble with finding information on managing stress and depression, issues that are quite common in patients with cancer and are associated with cancer-specific mortality.⁶⁷⁻⁶⁹ In older patients, the difficulty is even more concerning. Another study among newly admitted cancer found that in the early stage of cancer, mental-related symptoms were more prevalent and mental health was affected more severely before the physical-related symptom manifests.³³ Therefore, education on how to cope with mental issues during treatment should be initiated early.

Other studies on health literacy in cancer patients during different stages of management have shown a similar findings that a considerable portion of patients have inadequate health

literacy, ranging from over 20% to over 50%.^{22,23,26,27,31} In the longitudinal study by Halbach et al^{22,23} on breast cancer patients, health literacy was examined during the post-operative hospital stays and 40 weeks after surgery, and the population of patients showed no significant improvement in health literacy after the period. Cancer patients with lower health literacy also are less determined to actively participate in the treatment process and decision making, which further detaches the patients from receiving more health-related information.^{47,70,71} This is especially true in older patients, as age-associated differences usually resulted to fewer information needs and a stronger preference for a more passive involvement in the management of cancer.^{47,70} Furthermore, most commonly used written information materials (brochures, handouts) have been given to patients without consideration of their ability, which increased the difficulties in educating patients with lower health literacy.¹¹ However, physician encouragement and the use of interactive decision aids have had a positive effect on patients' education and involvement.^{11,30,72} These findings seem to suggest that without proper, early intervention, patients with low health literacy are more likely to be detached from patients' education and the process of cancer care, from the stage of diagnosis. Thus, as soon as the diagnosis was confirmed, efforts should be made by the healthcare team to help the patient receive proper and cohesive information and utilize more effective means of delivery, as well as encouraging the involvement of the patients in the cancer care process; and in return improve the health literacy and ultimately the quality of life of cancer patients.^{11,30,71,72} Also, caregivers and family members education is also important to improving patient health literacy but are often neglected, while they could account for over 40% of information that patient received and majorly influence treatment decision,^{73,74} especially in older patients, who tends to prefer a more passive approach to making treatment decision.^{47,70,71}

This study has several limitations. In this study, we weren't able to account for several potential factors that might influence health literacy in this group of patients, including: income, access and familiarity to media and the internet, cognition and visual acuity. Also, the HLS-SF12 is a valid and reliable instrument but only limited to measuring general health literacy, and couldn't address cancer-specific issues. Further studies should aim for a larger sample size and include other factors that might influence health literacy as mentioned, and use more cancer-oriented health literacy measurements.

Conclusion

In the newly admitted cancer patient, age, education, and living areas were associated with health literacy while there was no significant difference in health literacy between genders. Many newly admitted cancer patients have trouble understanding important information that is crucial to their well-being. Therefore, effort should be made to increase patient health literacy and improve communication and cohesion of information.

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Author Contributions

All author contributed and provided input in the study design and data collection, analysis of the results and the writing of the manuscript.

Ethical Approval/Patient Consent

The research was granted ethical clearance from The Ethical Committee of the Hanoi Oncological hospital decision number: 32/CN-HĐĐĐ at 28/03/2019. All study subjects were informed about the objective of the study and their right to refuse to do the interview or stop the interview at any point of the interview or skip any questions that may make them uncomfortable.

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