

Factors Associated with Health Literacy Competencies: Analysis of Thai Health Literacy Survey 2019

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Research article

Keywords: Health literacy, consumer protection, vulnerable consumer, survey, Thailand

Posted Date: September 30th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-60016/v1>

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Abstract

Background

The consumption of health-related products has been increasing continuously. Information on health-related products can make it difficult for some people with limited health literacy to use. This study investigated the extent to which health literacy competencies in the aspect of consumer protection related to demographic and socio-economic factors, using data from the Thai Health Literacy Survey (THL-S) among Thai citizens aged 15 years and above (2019).

Methods

The THL-S used a stratified three-stage-sampling to draw a sample of Thais aged 15 years and above. Participants were interviewed with a questionnaire of 34 items measuring health literacy and 8 items measuring behavioural practices. Proportions of responses (the 6-Likert scales) in accessing, understanding, communicating and making decisions related to the consumer protection aspect were performed. Logistic regression models were used to explore the association between health literacy competencies and participant's socioeconomic, demographic, health and social characteristics.

Results

Levels of difficulties in the consumer protection aspect varied among health competencies, with the most difficult in communicating and the least difficult in understanding. Half of Thais (around 42%) felt difficult to ask for information from healthcare providers. One-third of Thais (38%) experienced difficulties in accessing reliable information about medicine, cosmetic products, herbal products and food supplements. Participants who had a lower level of education, cannot read, did not have health screenings, were living in poverty, did not hold leading roles in the community, were male, had hearing impairment, or were at an older age, experienced more difficulties in practising health literacy competencies.

Conclusions

Vulnerable consumers face significant barriers in accessing, understanding, communicating and making decisions in the consumer protection aspect. Health literacy programs that aim to build competencies and empower vulnerable consumers should be developed. There is also a need to adapt current information on health related products to be as clear an accessible as possible but reliable to meet health literacy needs.

Background

In 2019, Thailand had its first survey on health literacy among a population above 15 years of age. A stratified-three-stage sampling was used together with a weighing method to represent both entire and regional populations. This survey was one of the largest national surveys, with the sample size of 17,530 people. The results showed approximately 19 % of Thais who had insufficient health literacy in accessing, understanding, communicating and making decisions, based on four domains of health-related information including health care, disease prevention, health promotion and health and medical products. Furthermore, Thais found that accessing health-related information in all aforementioned domains as the most difficult, followed by communicating about health (1). The survey has become a crucial starting point for shaping national health care reform strategies. Health literacy has also been included in national legislative initiatives. The 20-year National Strategic Plan: 2018 - 2037 has included health literacy as one of the eleven health care reform areas. The five-year National Health Development Plan: 2018 - 2022 also indicates that health literacy among Thais should be improved by 25 % by 2020.

From the literature, health literacy might play a significant role in maintaining or improving health across one's lifespan. It is also thought to be a potential predictor of health inequity (2-4). A cross-sectional study on health literacy among Dutch adults (2013) (4) investigated on how health literacy competencies related to demographic and socio-economic characteristics, using some data from the European Health Literacy Survey (HLS-EU) in the Netherlands. The study showed interesting findings, arguably leading to another point of view on analysing and interpreting health literacy competencies at a national level, rather than focusing on general health literacy. The previous study categorised health literacy competencies into different health domains and analysed their relationships with education, income, social status, age and sex, as well as individual competency within each domain. The study showed inconsistent relationships between both demographic and socio-economic characteristics and all health literacy competencies from

each domain as well as general health literacy. For example, education and income were significantly associated with accessing and understanding health information, but to a lesser extent with appraising and applying. With regard to accessing and understanding, the group with the lowest income had lower health literacy scores compare to the group with the highest income, yet this difference was found only in the health care domain. These findings allow policy makers to better identify potential characteristics of the target group when designing strategies for improving access to and understanding of health information in the health care domain.

However, within the context of the general Thai population, little is known on how different health literacy competencies relate to each other, as well as what factors influence these competencies and in what way. Understanding these relationships would not only help us to better understand health literacy but would also contribute to creating more effective ways of designing, planning, implementing and evaluating health services in all relevant domains. The findings could empower Thai citizens and reduce health inequity in Thailand, pointing out the importance of addressing health literacy in the national legislative initiatives.

According to the Thai National Health Examination Survey 2014, the percentage of Thais aged 15 years and above who consumed health-related products and supplements within 30 days increased by 2.25 folds within five years (14.8 % in 2010 versus 33.3 % in 2014) (5, 6). Moreover, the out of pocket expenditure of households in Bangkok due to the consumption of supplements accounted for one-third of the total amount of the out of pocket expenditure on health care (7). In a highly competitive market of health-related products and supplements, individuals and companies use marketing strategies, social media and easy-to-understand formats to draw customer's attention. There is plenty of information about health-related products and supplements but such information lacks characteristics of trustworthiness (8). Some people pay attention to pictures, colours, and celebrities on the product's labels and the advertisements. This makes it difficult and often misinforming to those with limited health literacy skills to distinguish reliable information, and access reliable sources. Therefore, there is need to ensure reliable, accessible, and understandable health information on health related products as it helps protect the consumer against misinformation on health related products. This study investigated the extent to which health literacy competencies, which are accessing, understanding, communicating about health, and making health-related decisions in the aspect of consumer protection, relate to demographic and socio-economic factors, using data from the Thai Health Literacy Survey among Thais aged 15 years and above (2019).

Methods

Study design and data collection

The Thai Health Literacy Survey used a stratified-three-stage sampling to draw a sample of Thais aged 15 years and above (1). The sample was stratified based on health regions, provinces, enumeration areas, and households. In the first stage, three provinces in each health region (13 health regions) were systematically identified by ranking the number of inhabitants aged 15 years and above from smallest to largest. Thirty-seven provinces were selected in total. In the second stage, 492 enumeration areas within the selected provinces were defined based on their locations. In the third stage, a total of 7,380 households were systematically selected from each enumeration area. In each household, all members who were 15 years old or older were interviewed with a questionnaire. Data were collected at the participant's home between March to August 2019. A total of 7,295 households participated in the survey in which a total of 18,832 people met the survey criteria. The enumerators were able to interview 17,530 people (response rate of 93%). Other 867 people were unavailable after a three-time follow-up and 375 people refused to participate in the interview.

Assessment of variables

Health Literacy

The questionnaire contained 42 items of which 34 items measure health literacy competencies in four domains, while 8 items measure behavioural practices. The questionnaire was developed by the Department of Health, Ministry of Public Health with financial support from the Health System Research Institute. The items measuring health literacy competencies in the consumer protection aspect are shown in Table 1. The questionnaire was pre-tested for understandability and relevance with a sample of 722 people from six provinces across all regions (n = 120 in each province). Focus groups were conducted with 10 – 12 respondents who had difficulties understanding the questionnaires. The overall internal reliability of the questionnaire, as indicated by Cronbach's alpha coefficient of 0.94, was good. The internal reliability for the health literacy competencies was also good (Cronbach's alpha

coefficient of 0.88 for 'accessing', 0.86 for 'understanding', 0.90 for 'communicating' and 0.88 for 'making health-related decisions'). For accessing, understanding, and making health-related decisions, the respondents were asked to choose from a 6-point Likert scale ranging from, 1 = very easy, 2 = fairly easy, 3 = fairly difficult, 4 = very difficult, 5 = unable to perform, and 6 = confident in performing but never had a chance to perform. For communicating, the 6-point Likert scale ranged from, 1 = all the time, 2 = sometimes, 3 = never do, 4 = not dare to do, 5 = don't want to do, and 6 = having someone do it.

Table 1
Health Literacy items for the consumer protection aspect

Competence domain	On a 6-Likert scale from very easy to very difficult, 1. = very easy, 2. = fairly easy, 3. = fairly difficult, 4. = very difficult 5. = unable to perform 6. = confident in performing but never had a chance to perform how easy is it for you to...
Accessing	Find reliable information about medicine, cosmetic products, herbal products and food supplements.
Understanding	Understand information on labels of medicine products, cosmetic products, herbal products, medical devices, and hazardous chemical products.
Communicating	Inquire healthcare providers about health-related products
Making decisions	Make decisions about what food supplements or herbal products are suitable for you.

Demographic and socio-economic characteristics

The demographic and socio-economic characteristics analysed in this study are sex, age group, marital status, the highest level of education, level of reading difficulty, level of writing difficulty, holding leading roles in the community, income sufficiency, occupation, insurance scheme, presence of chronic disease, level of hearing difficulty and use of eyeglasses or contact lens. All of the demographic and socio-economic data were analysed as categorical variables.

Statistical analysis

Proportions of responses (the 6-Likert scales) in four competency domains in the consumer protection aspect were performed. Logistic regression models were used to explore the association between health literacy competencies and socioeconomic, demographic, health and social characteristics. The responses of each domain were grouped into a dichotomous variable representing whether respondents have difficulties in accessing, understanding, communicating or making decisions. For each competency, a binomial logistic regression was performed using R 3.1.0 (9, 10).

Results

The demographic and socio-economic characteristics of the sample are shown in Table 2. Female samples accounted for 61% of all samples, which were overrepresented comparing to the distribution of the Thai population (11). In terms of age group, most of the samples were in 60 years and above and 46–59 years groups. These figures were not in line with the distribution of the Thai population, as the samples aged 60 years and above and aged 46–59 years were overrepresented while the samples aged 25–45 years and 15–24 years were underrepresented. Majority of the samples were married or living together. Half of the samples completed primary education while 4% was illiterate. Approximately 10% had insufficient income to support their family. One-third of

the samples worked in the agricultural section. Besides, the majority of the samples (79%) were registered under the universal health care coverage scheme (UCS).

Table 2
Characteristics of study participants

Characteristics	Total (n = 17,530)		Male (n = 6,779)		Female (n = 10,751)	
	%	n	%	n	%	n
	Age group					
15–24 years	10.9	1,906	12.3	832	10.0	1,074
25–45 years	24.0	4,208	25.2	1,707	23.3	2,501
46–59 years	30.2	5,302	27.8	1,887	31.8	3,415
60 years and above	34.9	6,114	34.7	2,353	35.0	3,761
Missing values	0	0	0	0	0	0
Marital status						
Single	21.5	3,764	24.8	1,678	19.4	2,086
Married or living together	63.3	11,099	67.7	4,588	60.6	6,511
Separated or divorced	15.1	2,651	7.5	507	19.9	2,144
Missing values	0.1	16	0.1	6	0.1	10
Highest level of education						
No education	4.0	702	2.8	190	4.8	512
Primary education	51.6	9,043	47.8	3,240	54.0	5,803
Lower secondary education	13.0	2,276	15.8	1,073	11.2	1,203
Upper secondary education	19.1	3,347	21.2	1,436	17.8	1,911
Tertiary education	12.3	2,150	12.3	835	12.2	1,315
Missing values	0.1	12	0.1	5	0.1	7
Income sufficiency						
Deprived	11.7	2,051	10.4	706	12.5	1,345
Sometimes sufficient	47.0	8,241	47.4	3,212	46.8	5,029
Often sufficient	35.1	6,157	36.2	2,454	34.4	3,703
Saving	6.0	1,056	5.9	398	6.1	658
Missing values	0.1	25	0.1	9	0.1	16
Occupation						
Unemployed	20.0	3,503	12.6	854	24.6	2,649
Agriculture	33.7	5,899	35.6	2,410	32.5	3,489
Business owner	12.9	2,253	10.1	682	14.6	1,571
Casual employment	18.6	3,257	25.0	1,693	14.5	1,564
Government officer	4.7	820	5.6	378	4.1	442
Employees of private companies	3.7	654	4.5	303	3.3	351

*UCS: Universal Coverage Scheme; **SSS: Social Security Scheme; ***CSMBS: Civil Servant Medical Benefit Scheme

Characteristics	Total		Male		Female (n = 10,751)	
	(n = 17,530)		(n = 6,779)			
	%	n	%	n	%	n
Student	6.3	1,098	6.4	435	6.2	663
Others	0.2	35	0.3	18	0.2	17
Missing values	0.1	11	0.1	6	0.0	5
Insurance scheme						
UCS*	79.0	13,842	78.1	5,293	79.5	8,549
SSS**	9.8	1,716	10.4	706	9.4	1,010
CSMBS***/ State enterprise	8.6	1,516	8.8	594	8.6	922
Private insurance and others	2.6	456	2.7	186	2.5	270
Missing values	0.0	0	0.0	0	0.0	0
*UCS: Universal Coverage Scheme; **SSS: Social Security Scheme; ***CSMBS: Civil Servant Medical Benefit Scheme						

The estimates of four competencies (accessing, understanding, communicating, and making decisions) were weighted by sex and age to represent the Thai population aged 15 years and above. The proportion of responses in four competencies of the consumer protection aspect is presented in Table 3. The proportions show that level of difficulties that participants experienced (responses of difficult, very difficult and unable to perform) vary among the health literacy competencies, with communicating being the most difficult while understanding being the least difficult. Almost half of Thais (around 42%) felt that it is difficult to inquire about healthcare providers about health-related products. Approximately one-third of Thais (38%) were unable to or experience difficulties in accessing reliable information about medicine, cosmetic products, herbal products and food supplements. The least difficult competency rated by this population was understanding information on labels of medicines, cosmetic products, herbal products, medical devices, and hazardous chemical products.

Table 3
Weighted proportions of responses in four competency domains in the consumer protection aspect

Competency domain	Items	Very easy	Fairly Easy	Fairly Difficult	Very difficult	Unable to perform	Confident in performing but never had a chance to perform
Accessing	Find reliable information about medicine, cosmetic products, herbal products and food supplements	14.5	39.9	12.3	4.5	21.2	7.6
Understanding	Understand information on labels of medicines, cosmetic products, herbal products, medical devices, and hazardous chemical products	26.8	54.2	11.4	3.2	3.1	1.3
Communicating	Inquire healthcare providers about health-related products	14.1	39.6	38.6	1.6	1.7	4.4
Making decisions	Able to choose suitable food supplements or herbal products	18.6	56.5	12.5	2.6	3.6	6.2

Socioeconomic, demographic, health and social characteristics associated with all health literacy competencies in the aspect of consumer protection include the highest level of education, sex, level of reading difficulty, not receiving health screenings, and holding leading roles in the community as shown in Table 4. However, the extent of association varies among competencies. These characteristics associated mostly with accessing, followed by communicating, understanding and making decisions. Overall, it was found that people with a lower level of education, a higher level of reading difficulty, no previous health screening, no leading roles in the community, or were male, experienced more difficulties in practising health literacy competencies. People who reported

inadequacy of income were more likely to experience more difficulties in accessing, understanding or communicating than people who had savings. Government officers tended to experience fewer difficulties in accessing, understanding or communicating than unemployed people. However, no association between occupation and ability to choose suitable food supplements or herbal products was found. People under private insurance or social security scheme were less likely to experience difficulties in accessing information compared to those registered with the UCS. Regarding understanding, people with private insurance or Civil Servant Medical Benefit Scheme (CSMBS) tended to experience fewer difficulties than people with UCS. The older the people were, the more difficult they experienced in accessing, understanding and communicating. The marital status associated only with accessing. Level of reading difficulty showed a stronger association with health literacy competencies compare to the level of writing difficulty. People with no chronic diseases or were diagnosed with chronic diseases were less likely to experience difficulties in health literacy competencies than those who never received screening. People with hearing impairment were more likely to experience difficulties compared to those without, while people who wear eyeglasses tended to experience less extent of difficulties than people who do not.

Table 4

Associations between socioeconomic, demographic, health and social characteristics and health literacy competencies

Consumer protection aspect	Accessing			Understanding			Communicating			Deciding		
	OR	95% CI		OR	95% CI		OR	95% CI		OR	95% CI	
		Upper	lower		Upper	lower		Upper	lower		Upper	lower
Experiencing difficulties in finding, understanding, communicating or deciding about healthcare products e.g. medicines, herbs, cosmetics												
Highest level of education (reference group: no education)												
Primary education	1.125	0.855	1.481	0.601*	0.487	0.741	0.796*	0.639	0.991	0.803*	0.651	0.990
Lower secondary education	0.628*	0.468	0.843	0.635*	0.494	0.816	0.688*	0.533	0.888	0.679*	0.538	0.858
Upper secondary education	0.466*	0.348	0.625	0.568*	0.442	0.729	0.635*	0.493	0.817	0.57*	0.452	0.718
Tertiary education	0.325*	0.237	0.446	0.510*	0.383	0.679	0.547*	0.412	0.725	0.469*	0.366	0.601
Income sufficiency (reference group: saving)												
Deprived	1.709*	1.397	2.089	1.260*	1.002	1.586	1.289*	1.043	1.594	0.991	0.839	1.170
Sometimes sufficient	1.497*	1.258	1.781	1.332*	1.083	1.64	1.164	0.963	1.406	0.884	0.766	1.020
Often sufficient	1.143	0.96	1.361	1.076	0.872	1.328	1.088	0.899	1.316	1.077	0.933	1.243
Occupation (reference group: unemployed)												
Agriculture	1.081	0.963	1.214	0.699*	0.623	0.784	0.714*	0.638	0.799	0.845*	0.767	0.931
Business owner	0.727*	0.633	0.835	0.773	0.663	0.901	0.859*	0.743	0.993	1.056	0.936	1.19
Casual employment	0.843*	0.742	0.959	1.010	0.885	1.153	0.859*	0.755	0.979	1.010	0.904	1.127
Government officer	0.584*	0.459	0.744	0.735*	0.55	0.983	0.724*	0.56	0.938	0.879	0.722	1.07

* p-value < 0.05

¹UCS: Universal Coverage Scheme; ²SSS: Social Security Scheme; ³CSMBS: Civil Servant Medical Benefit Scheme

Consumer protection aspect	Accessing			Understanding			Communicating			Deciding		
Employees of private companies	0.660*	0.502	0.868	0.954	0.709	1.283	0.682*	0.509	0.915	0.881	0.713	1.088
Student	0.828	0.633	1.082	0.750	0.555	1.013	0.738*	0.56	0.974	0.910	0.746	1.109
Others	0.813	0.303	2.181	0.929	0.315	2.737	1.615	0.711	3.666	0.843	0.4	1.777
Insurance scheme (reference group: UCS¹)												
SSS ²	0.755*	0.65	0.876	0.912	0.765	1.088	0.917	0.777	1.082	0.889	0.785	1.007
CSMBS ³ /State enterprise	0.917	0.791	1.063	0.825*	0.697	0.975	1.118	0.96	1.303	0.958	0.843	1.089
Private insurance and others	0.648*	0.5	0.839	0.662*	0.477	0.918	0.913	0.69	1.207	0.996	0.811	1.224
Age group (reference group: 15–24 years old)												
25–45 years	1.683*	1.367	2.072	1.206	0.954	1.523	1.252*	1.005	1.56	0.877	0.747	1.028
46–59 years	3.485*	2.809	4.322	1.543*	1.209	1.97	1.551*	1.232	1.953	1.002	0.844	1.188
60 years and above	6.784*	5.421	8.49	2.484*	1.935	3.188	1.957*	1.543	2.481	1.099	0.919	1.315
Female (reference group: male)	0.9*	0.831	0.975	0.822*	0.753	0.896	0.837*	0.77	0.909	0.754*	0.704	0.807
Marital status (reference group: separated or divorced)												
Single	0.843*	0.723	0.984	0.973	0.829	1.143	1.064	0.911	1.244	1.052	0.925	1.197
Married or living together	0.92	0.821	1.032	0.897	0.801	1.004	0.949	0.849	1.062	0.934	0.849	1.029
Level of reading difficulty (reference: fluent)												
Cannot read	2.168*	1.503	3.128	2.32*	1.736	3.101	1.847*	1.365	2.501	1.357*	1.027	1.794
Can read but not fluent	1.775*	1.476	2.135	1.293*	1.072	1.56	1.515*	1.252	1.832	0.974	0.83	1.142
Level of writing difficulty (reference: fluent)												

* p-value < 0.05

¹UCS: Universal Coverage Scheme; ²SSS: Social Security Scheme; ³CSMBS: Civil Servant Medical Benefit Scheme

Consumer protection aspect	Accessing			Understanding			Communicating			Deciding		
Cannot write	1.267	0.867	1.852	2.27*	1.675	3.078	1.138	0.83	1.56	1.263	0.944	1.689
Can write but not fluent	1.223*	1.024	1.461	1.627*	1.35	1.962	1.049	0.868	1.267	1.354	1.158	1.583
Having chronic diseases (reference group: never received screening)												
No chronic diseases	0.869*	0.784	0.963	0.799*	0.715	0.894	0.773*	0.694	0.862	0.708*	0.65	0.771
Previously diagnosed with chronic diseases	1.012	0.906	1.131	0.84*	0.748	0.944	0.837*	0.747	0.937	0.622*	0.566	0.683
Hearing impairment	1.346*	1.147	1.578	1.114	0.966	1.284	1.285*	1.119	1.476	1.103*	0.972	1.252
Wearing eyeglasses	0.842*	0.773	0.916	0.871*	0.796	0.953	0.95	0.871	1.036	0.952	0.886	1.022
Having leading role in community	0.568*	0.517	0.624	0.555*	0.493	0.626	0.599*	0.536	0.669	0.615*	0.565	0.669
* p-value < 0.05												
¹ UCS: Universal Coverage Scheme; ² SSS: Social Security Scheme; ³ CSMBS: Civil Servant Medical Benefit Scheme												

Discussion

This study found that difficulties in the consumer protection aspect vary among health competencies, with communicating being the most difficult and understanding being the least difficult. Thai citizens felt that it is relatively difficult to inquire about healthcare providers about medicine, cosmetic products, herbal products and food supplements. They were also unable to or had some difficulties in accessing reliable information about medicine, cosmetic products, herbal products and food supplements. Each health literacy competency requires different skill sets and knowledge to practice. For accessing, a person requires proficient skills and knowledge to use technology to access resources (12). For understanding, a person requires to understand meanings of words and terms as well as having experiences, to interpret information correctly (13). To be able to communicate confidently, a person has to understand the situation, realize the impact of using health products on themselves and their relatives, know how to formulate questions and has enough self-confidence to ask or start a conversation with others (13). For making decisions, a person needs to have enough relevant information about the issue as well as self-determination and to be able to critically analyse possible consequences of different choices (13). On the other hand, the context of a person plays a role in determining the degree of difficulties in practising health literacy (13). If a person responds to stimuli very well, the same person might respond differently in another context with different stimuli and different level of difficulties. Possible reasons that Thais do not ask or have difficulties in asking or communicating with healthcare providers about health-related products relate to norms, beliefs, perception, prior experiences as well as lack of question formulation and communication skills. The paternalistic nature of the patient-doctor relationship in the Thai context could also be another explanation. Health care providers are the authority who responsible for diagnosis and treatment, while patients are viewed as passive and are not expected to actively participate in the process of decision making on their care or to ask any questions (14, 15). Doctors normally do not promote health-related products such as herbal supplements or food supplements and asking questions about health-related products or supplements may offend them, leading to arguments and negatively affect the patient-doctor relationship. Some people think that having arguments with their doctors might affect how the doctors treat them or their relatives. This finding is in line with a previous study in Thailand that showed hypertensive

patients did not ask for information from medical staffs because they felt obligated to their physicians, thereby missing an opportunity to gain related knowledge to take care of themselves (16).

This study confirms that health literacy levels can reflect responses as a result of interaction between individual skills required to practice health literacy competencies and the complexity of health care contexts. For optimal improvement of health literacy, there should be a match between individual skills and system demands. Skills such as searching for reliable sources and appraising reliability of information as well as asking for clarification from healthcare providers are needed to be addressed and trained. A system should be designed in a way that reduces barriers for practising these skills. Healthcare providers should encourage patients to ask questions in hospitals and primary care setting to improve patients' understanding of relevant health information on health-related products. A good example is 'Ask Me Three' approach, a practice that encourages patients and family members to ask three specific questions to better understand their health conditions. The practice was found to be effective in improving patient's understanding, communication skills, and compliance with health-related advice (17). In addition, there should be a mass communication to create a new norm that asking is a necessary action to protect one's benefits. Also, reliable sources of information are important to gain knowledge about health-related products and supplements. Another important recommendation is to promote and build skills and knowledge of the population for evaluating health information on health-related products and supplements. Finally, a monitoring and alert system for consumers about untrustworthy information of health-related products on the Internet and communities should be developed.

Our study found that people with a lower level of education, could not read, did not receive health screening, were living in poverty, did not hold leading roles in the community, were male, or have a hearing impairment or were at older age experienced more difficulties when practising health literacy competencies. The findings are similar to prior small-scale studies in Thai patients (18, 19). The extent of the association varies among competencies. These factors associated in a greater extent with accessing, followed by communicating, understanding and making decisions. The level of education influences development of health literacy competencies in a way that students have the opportunity to acquire and practice sets of skills and knowledge, especially literacy, numeracy, and critical thinking, which are crucial for practising health literacy competencies (13). Under the Thai national health education curricula for primary and secondary schools, there are sets of literacy skills, knowledge, and health-related practices that students are required to have. A lower level of education indicates fewer practices in health literacy competencies in the classroom, potentially leading to experiencing more difficulties in practising health literacy competencies in health-related contexts. The level of reading difficulty has a stronger association with health literacy competencies than the level of writing difficulty. Reading ability is crucial for accessing and understanding information, as most health-related information is presented in written forms. In Thailand, those with higher educations are more likely to have higher incomes and employed in companies with either private insurance or social security scheme or both (20). This could explain the differences that those with more income experienced less degree of difficulties in practising health literacy competencies. People who hold leading roles in the community may have more exposure to health-related information and events, and people who received an annual health screening may have more experiences in coping with various demands of the health service systems, which then helps to improve their health literacy competencies at a faster rate compared to those who did not have one.

Strengths and limitations of the study

The Thai Health Literacy Survey 2019 included health literacy measures that were relevant in Thai contexts. It measured the health literacy skills in four health domains; health care, disease prevention, health promotion and consumer protection. As the consumption of health-related products and supplements in Thailand has been increasing (5, 6), the improvement of health literacy in the consumer protection aspect might help Thai citizens make healthy choices during their life course.

Another strength comes from the sampling methods. The survey used a three-stage sampling technique based on health regions, provinces, enumeration areas and households. With the questionnaire administered face to face, the survey results ensured a better representation of Thai citizens in remote areas throughout the nation including some minorities who might have inadequate reading and writing abilities in Thai language.

A limitation of this study is that the sample overrepresented the elderly, which might have affected other factors such as adequacy of income, level of education, occupation, and ability to read and write (4). The questionnaire did not include some variables that might

have affected the opportunities to gain and practice health literacy skills such as experiences of taking care of ill people in the family and duration of living with the current disease (21).

Conclusions

In conclusion, characteristics of a person, as indicated by demographic, socioeconomic, health and social factors, can explain differences in how persons develop and practice health literacy skills and experience degrees of difficulties in practising health literacy skills in the consumer protection aspect. In particular, vulnerable consumers in the society, such as people with a low level of education, living in deprivation, at old age and hearing impairment, face significant barriers in accessing, understanding, communicating and making decisions in health-related products. The context of deprivation and social vulnerability in which these people live, might even worsen their quality of life. Therefore, health literacy programs should be developed to build health literacy competencies and empower vulnerable consumers. Responsible organizations should also promote adult education among elderly people to address basic literacy skills, media literacy, and health communication skills. Furthermore, there is a need to adapt the current health services and information on health-related products to meet health literacy needs among vulnerable consumers. In addition, health information on health-related products or services should be designed in a way that is understandable and accessible to everyone, regardless of their literacy levels.

Abbreviations

THL-S: Thai Health Literacy Survey; HLS-EU: European Health Literacy Survey; UCS: universal health care coverage scheme; SSS: Social Security Scheme; CSMBS: Civil Servant Medical Benefit Scheme; OR: Odds ratio; 95% CI: 95% confidence interval

Declarations

Ethics approval and consent to participate

This study is part of the Thai Health Literacy Survey 2019 that was approved by the Ethics Review Committee of the Department of Health, Ministry of Public Health (ID: 50-1/2561). All participants gave written informed consent to participate in the survey. For participants aged 15-16 years old, written informed consent were obtained from participants together with their guardians.

Consent for publication

Not applicable

Availability of data and materials

The data analysed for this study are not publicly available due to not obtaining ethical approval to share data publicly, but can be available from the corresponding author on reasonable request. The survey was carried out at the jurisdiction of the co-author. The survey questionnaire was developed by the Faculty of Public Health, Mahidol University in collaboration with Department of Health, Ministry of Public Health. The questionnaire is only available in Thai at <https://www.hsri.or.th/researcher/research/new-release/detail/11454>.

Competing Interests

The authors declare that they have no competing interests.

Funding

The Thai Health Literacy survey 2019 was funded by the Health System Research Institute. The funding agreement ensured the authors' independence in study design, data analysis, data interpretation, writing of the report, and publication. The funders had no

role in the design of this study; in the analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

Authors' contributions

RK designed the study, managed, analysed and interpreted the data and edited the manuscript. SK and RB prepared the manuscript and contributed to the discussions. All authors read and approved the final manuscript.

Acknowledgements

The authors would like to thank Mrs. Wimon Roma, and technical health workers from thirteen health promoting centers for their support in conducting the Thai Health Literacy Survey 2019. We would like to express sincere appreciation to Dr. Wanrudee Isaranuwatthai for her support in reviewing the manuscript. HITAP is funded by the Thailand Research Fund under the senior research scholar on Health Technology Assessment, the National Health Security Office, the Health System Research Institute and the Bureau of Health Policy and Strategy, Ministry of Public Health. HITAP's international unit has been supported by the Thai Health-Global Link Initiative Project, the international Decision Support Initiative (funded by the Bill & Melinda Gates Foundation and the Department for International Development, UK), and the Rockefeller Foundation to provide technical assistance on health intervention and technology assessment for governments of low- and middle-income countries. The findings, interpretations and conclusions expressed in this article do not necessarily reflect the views of the aforementioned funding agencies.

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