Health Literacy Problems and its associated factors among elderly in Thailand

By

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Abstract

This study aimed to identify the level of health literacy and factors related to inadequate and problematic levels health literacy among elderly in Thailand. This cross-sectional analytical study used the data set from the National Health Literacy Survey of Thailand. The study population of this study was Thai citizen aged 60 years and older residing in all 13 zones which consisted of 77 provinces of 4 regions in Thailand. A total of 6,477 elderly who passed the inclusion and exclusion criteria were recruited. Multivariable analysis was performed by including all independent variables into the model by assigning significant p-value. Our study observed that 37.58% of elderly had problematic health literacy level (51-66 %) with 95% CI: 36.40-38.76. Our multivariate analysis revealed that factors associated with problematic and inadequate level of health literacy were elderly having age group of $\geq$ 80 years (Adj.OR 2.12 ,95% CI:1.64-2.740, p-value <0.001), elderly without formal education (Adj.OR=6.08, 95% CI: 3.80-9.73, p-value <0.001), those who can't read and write fluently with Adj.OR 1.49 (95% CI, 1.15-1.94, p-value 0.003), (Adj.OR 1.53, 95% CI, 1.18-1.98, p-value 0.001) respectively. Furthermore, respondents who were never had health information acquisition from physician (Adj.OR=1.52, 95% CI, 1.32-1.74, with p-value <0.001), health professionals (Adj.OR=1.35, 95% CI, 1.17-1.56, p-value <0.001), health volunteers workers (Adj.OR=1.75, 95% CI, 1.50-2.03, p-value <0.001) and not using glasses or contact lens to see (Adj.OR=1.15, 95% CI, 1.01-1.32, p-value 0.035) were significantly associated with inadequate as well as problematic level of health literacy respectively. Nearly a quarter of the elderly has adequate level of health literacy. Moreover, the raising age amongst the elderly was significantly associated with inadequate health literacy level.

Keywords Health literacy, Elderly, Thai Health Literacy, problematic health literacy

1. Introduction

A large number of elder adults in developed countries have low health literacy (Hochhauser, Brusovansky, Sirotin, & Bronfman, 2019; Kutner, Greenburg, Jin, & Paulsen, 2006; Lor, Koleck, Bakken, Yoon, & Dunn Navarra, 2019; Visscher, Steunenberg, Zwikker, Heerdink, & Rademakers, 2021). Since the last thirty years, health literacy has increased extensive global interest. In addition, Thailand in 2017, elder persons accounts about 11 million, or 16.7%, of the total population and is projected to rise to 32% by 2040 (National Statistical Office, 2018).

Health literacy (HL) was conceptualized as "the cognitive and social skills which determine the motivation and ability of individuals to gain access to understand, and use information in ways that promote and maintain good health"(Liu et al., 2018; Sørensen et al., 2012). However, commonly health literacy is defined as "the degree to which people are able to access, understand, appraise and communicate information to engage with the demands of different health contexts to promote and maintain health across the life course" (Sørensen et al., 2012; Zumbo et al., 2006).

HL has been indicated as producing vigorous effectiveness on improving health practices and health outcomes (Burton et al., 2021). Small amount of Health Literacy is a significant public health concern around the world and including developed countries. In 2003, approximately 80 million adults of USA (36%) were estimated to have limited health literacy (Kutner et al., 2006). In 2015, nearly one out of ten individuals i.e.12% was observed to have inadequate health literacy in Europe (Van Hoa, Giang, Vu, Van Tuyen, & Khue, 2020). In addition, numbers of studies showed that inadequate health literacy has a strong impact on various health outcomes including low utilization rate of preventive measures and emergency services, increase healthcare costs and higher hospitalization rate, health behavior, and health equity (Tian & Xu, 2020). People with low level of health literacy should be more likely to have lower accessing health information, health care, self-preventing and treatments. As the result, the decision to select health care methods would regardless of academic principles (Pitug, Laohasiriwong, Senahad, & Soeung, 2020). Lacking HL has been observed to be related with destructive health outcomes.

Person's ability to acquire health related information can be affected by people aging conditions and it will also be associated with their physical and mental declines. Elder people require some type of training or schooling for sufficiently use healthcare services. So that, they can be able to read and calculate necessaries for them. The ageing people observe less likely to be use internet compared with other adults. Therefore, elderly is at a significantly vulnerable position in relation with their HL capacity (Van Hoa et al., 2020). Therefore, an increase in health literacy of people could enhance their knowledge on consequences of illicit drugs which could then resulted in not using those substances (Oo & Laohasiriwong, 2020). Older adults with low HL levels expressed their difficulty to understand and act upon health information (Bozkurt & Demirci, 2019; Montgomery, Morgan, & Srithanaviboonchai, 2020) resulting in no adherence to medical instructions (Kutner et al., 2006). Inadequate HL skills of older adults caused higher rate no adherence to their medical regimens. Older adults are concerned to improve their HL. So, improving people's health literacy is one of the most fundamental, economic, and effective measures to improve the health level of the entire population. Therefore, the aim of this study is to observe the level of health literacy within the elderly population and the factors associated with having inadequate and problematic level of health literacy. The results of this present study may contribute to visualize the status of health literacy and its associated factors in Thailand which will help the program managers, health experts and the policy makers at national and international levels in planning and taking

suitable actions.

2. Materials and Methods

2.1. Ethical consideration

The researcher submitted a proposal to the Department of Health, the Ministry of Public Health, and Thailand's Ethics Committee. Participants were informed of the study's goals, expected outcomes, and the right to leave at any time. Each participant was assured that their information would be kept confidential and that participating posed no risk. In addition, this study has also been approved by Khon Kaen University Centre for Research Ethics in Humans under ethical exemption (HE652126).

2.2. Study Design

This cross-sectional analytical study was used the data set from the National Health Literacy Survey of Thailand (Department of Health, Ministry of Public Health, 2021). Thai citizen aged 60 years and older residing in all 13 zones which consisted of 77 provinces of 4 regions in Thailand were selected as study population.

2.3. Sample Size and Sampling Population

A total of 6477 sample size has been calculated by assuming the power of test using a sample size calculation formula for logistic regression (Hsieh, Bloch, & Larsen, 1998). This study used the stratified three-stage sampling method of which 12 health zones and Bangkok Metropolitan were included in the initial step. Then, 3 provinces had been selected systematic randomly from each zone made the total of 36 provinces. The second step systematic random sampling has been applied to select units proportional to size of provinces. The third step, a systematic random sampling method used to select 15 households from each unit. Then after, a respondent from each household were participate in the study.

2.4. Data Collection

Face to face interview was conducted by using Semi structured questionnaire to assess the health literacy level of the respondents. The questionnaire consisted of 3 part as the following: Part 1 has 5 domains and 42 questions on health literacy. Similarly, part 2 consists of demographic and socioeconomic information including gender, age, marital status, educational level, occupation, literacy, adequacy of income, household commodity, roles in the community, and source of health information. Finally, part 3 includes questions regarding eyeglasses, hearing issues, weight, height, waist circumference, blood pressure, chronic disease, health insurance (8 questions). The questionnaire was adjusted based on the recommendations of 5 experts who were reviewed its content validity. The reliability of the edition was tested using 240 cases with similar characteristics to the samples. The Alpha Coefficient of Cronbach was 0.87.

2.5. Statistical analysis

Statistics analysis was performed by using STATA 10 Texas USA 2007 statistics analysis (Copyright of Khon Kaen University). For the bivariate analysis simple logistic regression was carried out to determine the correlation between one dependent variable and one independent variable with regardless of the impact of the rest of the variables reporting Crude Odds Ratio (Crude OR or OR) and 95% CI. The multivariable analysis was performed using a multilevel logistic regression by including all independent variables into the model by

assigning p-value for entry (Pe) 0.25, p-value for remove (Pr)> Pe, and eliminating variables that do not relate to the model by backward elimination method (Hosmer & Lemeshow, 2000). Finally, we have tested the Goodness of fit and report each variable's with Adjusted OR (OR adj.) and 95% CI at the 0.05 significance level (α = 0.05).

3. Results:

3.1. Description of the Study Population

A total of 6477 participants were involved in this study, of which, 3993 (61.65%) were female followed by male with 2,484 (38.35%). The majority of the respondents were with age group between 60-69 years with mean age 69.65 (±7.48). The majority of the study population were married (66.64%) and most of the respondents were with elementary school level of education (77.23%). Similarly, 37.58% of total participants had a problematic health literacy level (51-66%) with 95% CI: 36.40-38.76 and a mean of 75.07 (±21.03). (Table 1)

Table 1. Bivariate analysis between independent factors and level of health literacy among elderly in Thailand (n = 6,477)

Characteristics and socio-economic	Number	Percentage
Gender		
Male	2,484	38.35
Female	3,993	61.65
Age (years)		
60 - 69	3,634	56.10
70 - 79	2,053	31.70
≥ 80	790	12.20
Mean (Standard Deviation)	69.65(±7.48)	
Median(Minimum:Maximum)	68(60, 97)	
Marital status		
Single	371	5.73
Married	4,316	66.64
Windowed/Separated	1,784	27.54
Other	6	0.09
Education		
No formal education	514	7.94
Elementary school	5,002	77.23
Junior school	338	5.22
High school	385	5.94
Vocational certificate	76	1.17
Bachelor's degree or higher	162	2.50
Current Occupation		
Personal Business and Government Officer, Other	1,545	23.85
Laborers, workers (such as general contractors Housekeepers, cleaning workers, security guards)	598	36.47
Farmer / Gardener	1,972	9.23
Unemployed / Housewife (no income)	2,362	30.45
Reading skills		
Can't read	720	11.12
Not fluent read	2,580	39.83
Fluent read	3,177	49.05
Writing skills		
Can't write	2,903	44.82
Not fluent write	2,931	45.25
Fluent write	643	9.93
Financial status of family (During the past 1 year)		
Adequacy with saving	331	5.11
Adequacy without saving	2,130	32.88
Inadequate	3,044	47.00
Inadequate with debt	972	15.01
Household facilities (more than 1 answer)		
Electricity	6,369	98.33
TV	6,318	97.55
AM/FM radio	3,472	53.61
Cable TV	4,842	74.76

Characteristics and socio-economic	Number	Percentage
Computers	1,030	15.90
Mobile phones	4,043	62.42
Participated in the community		
Not Participated	5,128	79.17
Participated (more than 1 answer)	1,349	20.83
Community leaders (Auch as village headmen or subdistrict Headman)	60	4.37
President of the club or fund	106	7.72
Members of various clubs	478	34.81
Health Volunteers	435	31.66
Other Volunteers	134	9.75
Religious Leader	78	5.68
Other	276	20.09
Source of Health Information		
Not received at all	680	10.50
TV	3,426	58.57
AM/FM radio	1,168	19.97
Books/Newspapers/Journals	515	8.81
LINE	419	7.16
Facebook	314	5.37
Internet	372	6.36
Physician	2,244	38.37
Nurse	1,558	26.64
Pharmacists	328	5.61
Physical therapists	274	4.68
Dentists	2,204	37.68
Health volunteers	3,504	59.91
Family Members	1,653	28.26
Friend	1,182	20.21
Line audio/broadcast tower	1,692	28.93
Other	32	0.55
Health information acquisition		
Physician	3,389	52.32
Nurse	2,261	34.91
Other Health Personnel	2,311	35.68
Health volunteers	3,882	59.94
Family Members	1,874	28.93
Friend	992	15.32
Other	291	4.49
Residence		
Municipality	3,115	48.09
Outside the Municipality	3,362	51.91
Using glasses or contact lenses		
Yes	3,266	50.42
No	3,211	49.58
Hearing problems		
Yes	955	14.74
No	5,522	85.26
Body Mass Index (BMI)		
Obesity (BMI $\geq$ 25 kg/m^2)	2,552	39.40
Overweight (BMI = 23 -24.9 kg/m^2)	1,086	16.77
Normal (BMI = 18.5-22.9 kg/m^2)	2,230	34.43
Underweight (BMI < 18.5 kg/m^2)	609	9.40
Mean (Standard Deviation)	25.21 ($\pm$6.48)	
Median(Minimum:Maximum)	23.82 (12.42, 47.56)	
Chronic disease (more than 1 answer)		
Never checked	760	11.73
Do not have any chronic disease	1,734	26.78
Having chronic diseases (more than 1 answer)	3,983	61.49
Health insurance		
Universal health insurance	5,251	81.13
Social Security insurance	143	2.21
Government Insurance	829	12.84
State Enterprise Officer	30	0.46
Personal insurance	59	0.91
Community Welfare Fund	25	0.39
Other	328	5.08
Health Literacy Level		
Inadequate ($\leq$ 50 %)	2,423	37.41
Problematic (51 – 66 %)	2,434	37.58
Adequate level (67 – 84%)	1,452	22.42
Excellent ($\geq$85 %)	168	2.59
Mean (Standard Deviation)	75.07 ($\pm$21.19)	
Median(Minimum:Maximum)	75 (0: 100)	

3.2. Bivariate Analysis

Table 2.

Factors	n	%	CrudeOR.	95%CI	p-value
Gender					<0.001
Male	2,484	72.22	1	1	
Female	3,993	76.71	1.26	1.12to1.42	
Age (years)					<0.001
60 - 69	3,634	69.70	1	1	
70 - 79	2,053	79.20	1.65	1.45to1.88	
≥ 80	790	88.35	3.29	2.62to4.14	
Marital status					<0.001
Single	371	71.97	1	1	
Married	4,316	72.57	1.03	0.81to1.30	
Windowed/ Separated/ Other	1,790	81.45	1.71	1.32to2.20	
Education					<0.001
Vocational certificate or higher	238	29.83	1	1	
High school	723	57.81	3.22	2.35to4.41	
Elementary school	5,002	78.21	8.44	6.34to11.23	
No formal education	514	88.72	18.49	12.52 to27.30	
Current Occupation					<0.001
Personal Business and Government officer, Other	1,545	66.60			
Laborers, workers (such as general contractors Housekeepers, cleaning workers, security guards)	598	69.06	1.11	0.91-1.37	
Farmer/ Gardener	1,972	76.62	1.64	1.41-1.90	
Unemployed/Housewife (no income)	2,362	80.61	2.08	1.79-2.41	
Reading skills					<0.001
Fluent read	3,177	63.96	1	1	
Can't read / not fluent read	3,300	85.61	3.35	2.96to3.78	
Writing skills					<0.001
Fluently write	2,903	62.93	1	1	
Can'tread/notfluentread	3,574	84.78	3.28	2.91to3.69	
Financial status of family (During the past 1 year)					<0.001
Adequacy with saving	331	62.24	1	1	
Adequacy without saving	2,130	69.34	1.37	1.07to1.74	
Inadequate	3,044	77.89	2.13	1.68to2.71	
Inadequate with debt	972	82.61	2.88	2.18to3.80	
Household facilities					
Computers					<0.001
Available	1,030	62.14	1	1	
Unavailable	5,447	77.42	2.08	1.81to2.40	
Mobilephones					<0.001
Present	4,043	69.28	1	1	
Absent	2,434	84.47	2.41	2.12to2.74	
Participated in the community					<0.001
Participated	1,349	59.38	1	1	
Not Participated	5,128	79.10	2.58	2.27to2.94	
Health information acquisition					
From Physician					<0.001
Never	3,090	79.51	1.59	1.42to1.78	
From Other Health Personnel					<0.001
Never	4,168	78.41	1.64	1.46to1.84	
From health volunteers					<0.001
Never	2,597	80.09	1.59	1.41to1.79	
Residence					<0.001
Municipality	3,115	72.68	1	1	
Outside the Municipality	3,362	77.13	1.26	1.13to1.41	
Health status					
Using glasses or contact lenses					<0.001
No	3,266	79.64	1.65	1.47to1.85	
Hearing problems					<0.001
No	5,522	81.47	1.55	1.30to1.85	
Body Mass Index (BMI)					<0.001
Obese	2,552	72.22	1	1	
Overweight	1,086	74.03	1.09	0.93to1.28	
Normal	2,230	76.55	1.25	1.10to1.43	
Underweight	609	82.59	1.82	1.45to2.28	
Chronic disease					<0.001
Do not have any chronic disease	1,734	71.51	1	1	
Having chronic disease	3,983	74.57	1.16	1.02to1.32	
Never checked	760	85.13	2.28	1.82to2.85	
Health insurance					<0.001
Other Health Insurances	1,226	64.36	1	1	
Universal health insurance	5,251	77.47	1.92	1.66to2.22	

In our bivariate analysis, female was found to be associated with health literacy with OR 1.26, 95% CI 1.12-1.42, p-value <0.001. Similarly, Widowed /Separated/ Other had significant association it with OR1.71, 95% CI, 1.32 -2.20, p-value <0.001. Respondents age group ≥80 years were also significantly associated with inadequate and problematic health literacy level (OR=3.29, 95% CI, 2.62-4.14, p-value <0.001). Likewise, no formal education was another factor to be significantly associated with level of health literacy (OR=18.49, 95% CI, 12.52-27.30, p-value <0.001), similarly, unemployment was also observed to be associated with inadequate and problematic health literacy with OR 2.08 (95% CI, 1.79-2.41, p-value <0.001). Participants residing outside the municipality were found to be significantly associated health literacy with OR 1.26, (95% CI, 1.13-1.41), whereas, those, not using the glasses or contact lenses were also observed with significant association with health literacy with OR 1.65 (95% CI, 1.47-1.85, p-value <0.001), not having hearing problem had also significant association (OR=1.55, 95% CI, 1.30-1.85, p-value<0.001), underweight body mass index (BMI<18.5kg/m2) was observed with significant association (OR=1.82,95%CI: 1.45 to2.28, p-value <0.001). Likewise, those, who never checked for chronic disease and register with universal health insurance were significantly associated with inadequate to problematic health literacy with OR 2.28 (95% CI, 1.82-2.85, p-value <0.001) and OR 1.92 (95% CI, 1.66-2.22, p-value <0.001) respectively. (Table 2)

Biv Biariate analysis between independent factors and level of health literacy among elderly in Thailand (n = 6,477) Bivariate analysis between independent factors and level of health literacy among elderly in Thailand (n = 6,477)

3.2. Multilevel Analysis

The analysis between independent factors and level of health literacy among elderly in Thailand on the basis of multilevel logistic regression has been described in table 3. According to our findings, the elderly having age group of ≥ 80 years were significantly associated with health literacy with Adj.OR 2.12 ,95% CI:1.64-2.740, p-value <0.001. Elderly without formal education were also found to be associated with problematic and inadequate level of health literacy (Adj.OR=6.08, 95% CI: 3.80-9.73, p-value <0.001). Similarly, those who can't read / not fluent read with Adj.OR 1.49 (95% CI, 1.15-1.94, p-value 0.003), can't write / not fluent write with Adj.OR 1.53 (95% CI, 1.18-1.98, p-value 0.001), without cable TV facilities with Adj.OR 1.30 (95% CI, 1.11-1.51, p-value 0.001), without computers with Adj.OR 1.28 (95% CI, 1.08-1.53, p-value 0.004), without mobile phones (Adj.OR 1.45, 95% CI, 1.24-1.69, p-value <0.001), those who did not participate in the community were also found to be significantly associated with low level of health literacy with Adj.OR, 1.87 (95% CI, 1.60-2.18, p-value<0.001). Furthermore, respondents who were never had health information acquisition from physician (Adj.OR=1.52, 95% CI, 1.32-1.74, with p-value <0.001), never from health workers (Adj.OR=1.35, 95% CI,1.17-1.56, p-value<0.001) never got health information acquisition from health volunteers (Adj.OR=1.75, 95% CI, 1.50-2.03, p-value 0.001), likewise, not using glasses or contact lens to see were significantly associated with inadequate as well as problematic level of health literacy with Adj.OR 1.15 (95% CI, 1.01-1.32, p-value 0.035) respectively.

Table 3. Multilevel logistic regression analysis between independent factors and level of health literacy among elderly in Thailand (n = 6,477)

Factors	Number	%	CrudeOR.	Adj.OR.	95%CI	p-value
Age (years)						<0.001
60 - 69	3,634	69.70	1	1		
70 - 79	2,053	79.20	1.65	1.34	1.16-1.56	
≥ 80	790	88.35	3.29	2.12	1.64-2.74	
Education						<0.001
Vocational certificate or higher	238	29.83	1	1		
High school	723	57.81	3.22	3.29	2.27-4.77	
Elementary school	5,002	78.21	8.44	5.52	3.89-7.83	
No formal education	514	88.72	18.49	6.08	3.80-9.73	
Reading skills						0.003
Fluent read	3,177	63.96	1	1		
Can't read/not fluent read	3,300	85.61	3.35	1.49	1.15-1.94	
Writing skills						0.001
Fluently write	2,903	62.93	1	1		
Can't read / not fluent read	3,574	84.78	3.28	1.53	1.18-1.98	
Household facilities						
Unavailability of Cable TV	4,842	75.57	1.12	1.30	1.11-1.51	0.001
Unavailability of Computer	5,447	77.42	2.08	1.28	1.08-1.53	0.004
Unavailability of Mobiles	2,434	84.47	2.41	1.45	1.24-1.69	<0.001
Participated in the community						<0.001
Not Participated	5,128	79.10	2.58	1.87	1.60-2.18	
Health information acquisition from Physician						<0.001
Never	3,090	79.51	1.59	1.52	1.32-1.74	
Health information acquisition from Other Health Personnel						<0.001
Never	4,168	78.41	1.64	1.35	1.17-1.56	
Health information acquisition from health volunteers						<0.001
Never	2,597	80.09	1.59	1.75	1.50-2.03	
Using glasses or contact lenses						0.035
Yes	3,211	70.26	1	1		
No	3,266	79.64	1.65	1.15	1.01-1.32	

4. Discussion

This present study has been described the circumstantial threads which led by the

inadequate and problematic level of the health literacy among the elderly people. In this study, female was exceeded than male with the ratio of 1.62:1. However, this study was conducted among the elderly population, majority of respondents from age group 60-69 years and married. More than three quarter of the respondents has inadequate and problematic health literacy and it became the problem for the country to address them an adequate manner. The study from Turkey also revealed the 85.1% elderly population has problematic or inadequate health literacy (Bozkurt & Demirci, 2019). This finding is nearly similar with our study. This might be due to the Thailand will develop a Super Ageing Society by 2050 which means approximately 30% of the population will be elder with age of 65 years and above in 2031 (Nilnate, Hengpraprom, & Hanvoravongchai, 2016). As, an elder has 2.69 times higher association with diseases it is really important for them to enhance health literacy and orient them for the better life.

In our setting, aging among the elderly are likely to be associated with the inadequate and problematic health literacy. So, raising age is one of the challenges to adopt new knowledge. A study conducted in Poland suggested that ageing is one of the main causes of having adequate health literacy. Therefore, elderly was unable to prevent them from any health consequences (Duplaga, 2020). Similarly, respondents those who have no formal education are likely to be associated with the inadequate health literacy. Study from Nigeria suggested that those how were understand English language and have education on the use of medications are less likely to be associated with inadequate level of health literacy (Kuyinu, Femi-Adebayo, Adebayo, Abdurraheem-Salami, & Odusanya, 2020). In addition, the respondents who were unable to read and write had inadequate and problematic health literacy level. So, the consequences of the low level of knowledge on health-related activities is always associated with how the schooling has been taken. The National Assessment of Adult Literacy (NAAL), determined that the educational accomplishment was strongly connected with health literacy (Martin et al., 2009). Study observed that the groups that are more likely to have low level of health literacy include individuals with decreased lower educational attainment, and lower reading/writing ability (Duplaga, 2020).

Moreover, our study also revealed that people having household facilities of Cable TV, computers and mobile phones were less likely to have inadequate and problematic health literacy level. This might to be due to the updated information has been acquired from cable TV, computers through internet and mobiles phones. A study from Pakistan observed that the utilization of rapidly expanding mobile technology and media for dissemination of health information is a viable solution to update the information to the public (Sabzwari, 2017).

Furthermore, our study identifies that the participation in the community activities is also led to enhance the health literacy. Communication alone is not a simple solution to the complex problem of health literacy. Without effective communication, people have limited success in developing health literacy. Therefore, effective Communication with community participation can lead the advance of health literacy (Ratzan, 2001). The current study from Taiwan found that a higher frequency of watching health-related TV programs and more community involvement were both positively associated with higher HL (Lin, 2015).

Never the less, our study also revealed the acquisition of the health information from physician was also associated with improving health literacy level among elderly. In addition, the respondents who were unable to acquire the health information from health workers as well

as any health volunteers were significantly associated with inadequate and problematic health literacy level. Moreover, using glasses or contact lenses by the elderly has significantly decreased health literacy level. Study observed that older patients are particularly affected because their reading and comprehension abilities are influenced by their cognition and their vision and hearing status. Inadequate health literacy can result in difficulty accessing health care, following instructions from a physician, and taking medication properly. Patients with inadequate health literacy are more likely to be hospitalized than patients with adequate skills. Therefore, patients understand medical information better while information provided slowly, simple words are used, and a restricted amount of information is presented (SAFEER & JANN KEENAN). A Turkish study suggested that the health literacy of the patients amplified when the behaviours towards the correct use of contact lenses improved (DAGTEKIN et al., 2022).

As this study design has been focused on the secondary analysis, it is one of the limitations of this study. Disparate primary analysis, the researcher in secondary analysis must accept the method of data collection and the data "as it is". The researcher can't design the study based on the questions to be answered. Similarly, the researcher designs questions based on the data availability. Regardless of this limitation, secondary analysis of the National Health Literacy Survey of Thailand permitted the researcher to use data from a large sample in a laborious national study.

5. Conclusions

This current study revealed that as high as 75% of the elderly has inadequate to problematic level of health literacy. Moreover, the raising age amongst the elderly was significantly associated with inadequate health literacy level. In addition, respondents who do not have formal education, can't read fluently, unable to write fluently, don't have access of cable TV and computers as well as mobile phones were significantly associated with inadequate level of health literacy. Furthermore, eladerly who were not participated in the community activities, never had health information acquisition from physicians, health workers and health volunteers as well as those who were not using glasses or contact lens to see were likely to be associated with problematic to inadequate health literacy level. So, there is need for educational programs to raise the health literacy awareness among elderly was significantly essential. In addition, future longitudinal studies are recommended to better understand the relationship and causal effects of level of HL of the general public as well.

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