

Health literacy and coronavirus disease 2019 prevention behaviors of village health volunteers in Samut Songkhram Province, Thailand

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ABSTRACT

Village health volunteers (VHVs) play crucial leadership roles in promoting health behavior changes including searching for, controlling, and preventing the spread of COVID-19 within their communities. This cross-sectional study investigated the association between health literacy and COVID-19 prevention behaviors of 425 VHVs in Samut Songkhram Province, Thailand, who were selected using a multistage sampling method. Data were collected through a self-administered questionnaire and analyzed using Pearson correlation coefficient and linear regression analysis to determine correlations. Results revealed that most participants demonstrated good overall health literacy (63.3%), with COVID-19 prevention behaviors at a high level (53.6%). A positive correlation was observed between overall health literacy and COVID-19 prevention behavior ($r = 0.103$, p -value < 0.05). After adjusting for age in years, the overall health literacy score was found to be significantly related to the COVID-19 prevention behavior score (Beta = 0.146). These findings can be utilized to further enhance health literacy among VHVs in Samut Songkhram Province, Thailand and serve as a guideline to promote effective disease prevention behaviors within local communities.

Key words:

health literacy; coronavirus disease 2019; prevention behaviors; village health volunteers

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INTRODUCTION

The Coronavirus 2019 (COVID-19) pandemic is a significant global public health issue that affects people of all ages.¹ During the past two years, over 545 million people worldwide have been infected with COVID-19, resulting in more than 6.3 million deaths.² The World Health Organization (WHO) declared COVID-19, an emerging infectious disease as a Public Health Emergency of International Concern (PHEIC) on January 30, 2020 and classified it as a pandemic on March 11, 2020.³⁻⁴ The five countries with the highest numbers of COVID-19 confirmed cases were the United States, India, Brazil, France, and Germany. In Thailand, the first case of COVID-19 infection was reported on January 3, 2020. To date, there have been more than 4.5 million confirmed cases and over 30,620 deaths, with a mortality rate of 1.65%. Thailand ranks 138th in the world in terms of confirmed cases and 7th in Southeast Asia. COVID-19 is easily transmitted through inhaling respiratory droplets from coughing and sneezing, and direct contact with secretions of infected individuals. Factors that increase the risk of COVID-19 infection include high-risk behaviors and inadequate preventive measures taken by individuals. The six main preventive measures for COVID-19 include maintaining physical distancing, wearing masks, practicing hand hygiene, conducting temperature checks, getting tested, and using contact tracing applications.⁵⁻⁶

In Thailand, the public health sector has increasingly emphasized the importance of public health literacy, which encompasses cognitive and social skills that determine the motivation and ability of individuals to access, understand, and utilize information to promote and maintain good health.⁷⁻⁸ Village health volunteers (VHVs) play significant roles in primary healthcare. They are selected from local communities and receive training according

to the public health curriculum governed by the Ministry of Public Health. VHVs act as transformational leaders in healthcare settings, carrying out surveillance, screening, prevention, and control of COVID-19 infection to curb the spread of the disease.⁹ Community surveillance involves educating people about practicing behaviors such as consuming hot food, using serving spoons, handwashing, and seeking prompt medical attention when experiencing suspected COVID-19 symptoms. Local public health officers, along with VHVs, are responsible for carrying out surveillance, screening, and prevention efforts. VHVs play a vital role in surveillance, tracking, and identifying individuals from high-risk areas, providing self-defense advice to the local communities under their care.¹⁰⁻¹¹ Therefore, it is essential that VHVs are aware of the correct disease prevention and control behaviors, enabling them to effectively conduct screening, surveillance, and disease control measures that can reduce the spread of COVID-19 in the community.

A literature review confirmed that factors associated with healthcare monitoring and outcomes consistently showed a relationship with health literacy, and directly influenced the ability of people to practice effective self-care and maintain good health.¹²⁻¹³ Health literacy plays a crucial role in fostering infectious disease prevention behavior among VHVs.¹⁴ Previous studies determined that individuals with low health literacy were more likely to engage in health-risk behaviors, such as neglecting self-preventive measures and not receiving COVID-19 vaccinations.¹⁵⁻¹⁶ A study conducted in Health Region 6 of Thailand revealed that VHVs exhibited excellent overall health literacy but displayed insufficient COVID-19 prevention behavior.¹¹ Meanwhile, a study conducted among VHVs in Sukhothai Province, Thailand indicated that most VHVs

demonstrated high levels of COVID-19 prevention behavior.¹⁷ Despite the improving COVID-19 situation in Thailand, now declared an endemic disease, controlling and preventing the spread of COVID-19 remain crucial in transitioning to the New Normal to ensure public safety.¹¹ Primary COVID-19 vaccination and booster doses for individuals of all ages play a vital role in preventing infection, severe illness, and death. Samut Songkhram, Thailand's smallest province, consists of three districts that implement monitoring and screening programs for at-risk groups. These programs include conducting home visits to identified risk groups, the establishment of community screening points, and providing home vaccination services to bedridden elderly individuals. VHVs play a crucial role in public health by carrying out duties related to infectious diseases within their communities. Given the current COVID-19 situation, VHVs must adapt to the changing work environment and possess health literacy regarding infectious disease prevention behavior to effectively guide community members in adopting appropriate COVID-19 prevention measures.¹² As a result, the objectives of this study were to investigate health literacy and COVID-19 prevention behavior among village health volunteers in Samut Songkhram province, as well as explore the relationship between these two variables. Findings can be utilized to improve COVID-19 prevention operations, enhance health literacy, and foster COVID-19 prevention behavior among VHVs, enabling them to serve as positive role models in the community.

METHODS

The target population of this cross-sectional study was 2,286 VHVs in Samut Songkhram Province, Thailand. Data were collected from September 2022 to January 2023.

Population and sample

The G*power program was used to calculate sample size using linear multiple regression with a small effect size of 0.02, a 95% confidence level, and an 80% power. We increased the sample size by 10%, yielding 435 participants. As a result, 73 VHVs were recruited for each of the six areas. However, the total final sample size of 425 VHVs with complete data was used for analysis. Inclusion criteria for the participant were VHVs who had at least 1 year of experience as VHVs in the area of study and signed consent forms. The sample was selected by multistage sampling method as follow:

- Step 1: Samut Songkhram Province is divided into 3 districts and all districts were sampled to ensure an even distribution across the entire province.
- Step 2: Simple random sampling was used to select 2 sub-districts from each district, giving a total of 6 sub-districts.
- Step 3: Villages were selected using simple random sampling, with 2 villages chosen from each sub-district, giving a total of 12 villages, as shown in Fig. 1

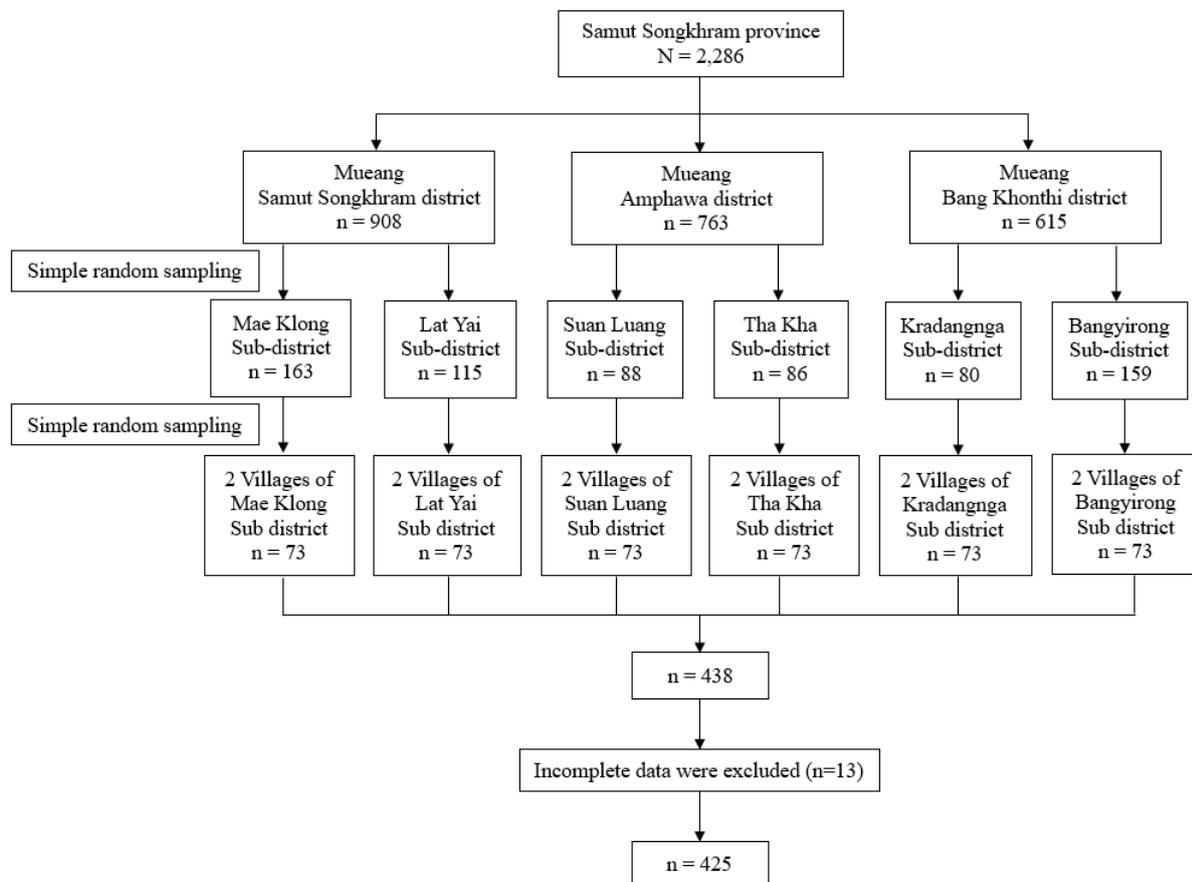


Figure 1. Flow chart for participant selection

Research instrument

A questionnaire was used for data collection, divided into three parts as follows:

Part 1 asked for general information, i.e. gender, age, marital status, education level, length of service as a VHV, COVID-19 infection, underlying diseases and history of hospital admissions as both closed-ended and open-ended questions, 8 items.

Part 2 asked about health literacy related to COVID-19. This section of the questionnaire was adapted from the previous research¹⁸. Scores were interpreted according to the criteria provided by the Health Education Division, Department of Health Service Support, Ministry of Public Health B.E. (2020)¹⁸. A total of 24 items was divided into 6 components as healthcare information and

service access skills, communication skills in COVID-19 prevention, decision-making and questioning, skills for disease prevention, self-management skills for disease prevention, and media literacy skills. A 5-point rating scale used to assess 24 items gave 120 as the maximum score. Overall health literacy was interpreted as follows. Total score of less than 60.00% was poor. Health literacy was not sufficient to provide self-care for good health. Total score of 60.0-70.0% was fair. Low level of health literacy may be sufficient to practice correct self-care for good health. Total score of 70.0-80.0% was good. Sufficient health literacy to practice self-care correctly for good health. Total score higher than 80.0% was excellent. High health literacy to correctly practice self-care to maintain good health sustainably and professionally.

Part 3 asked about COVID-19 prevention behavior. This section of the questionnaire was developed based on previous literature reviews. Examples of questions were "You wear a face mask when leaving home or doing activities with others" and "You avoid close contact with people who have a fever and cough, sneeze, or sore throat". Scores were interpreted according to the criteria provided by the Health Education Division, Department of Health Service Support, Ministry of Public Health B.E. (2020)¹⁸. In total, 18 items were assessed on a 5-point rating scale. Overall COVID-19 prevention behavior was interpreted as follows. Total score of less than 60.0% was poor. People have applied incorrect self-care and COVID-19 prevention behavior. Total score of 60.0-70.0% was fair. People had slightly shown correct self-care and COVID-19 prevention behavior. Total score of 70.0-80.0% was good. Most people followed correct self-care and COVID-19 prevention behavior. Total score higher than 80.0% was excellent. People have constantly applied correct self-care and COVID-19 prevention behavior.

The questionnaire was measured for content validity by three experts. The index of item objective congruence (IOC) for two sets of the questionnaire was 1.00. The questionnaire was pretested by 30 people having similar characteristics as the samples. The reliability of the questionnaire measured by Cronbach's Alpha Coefficient was 0.96 for health literacy and 0.94 for COVID-19 protection behaviors, respectively.

Ethical approval

The research was approved in accordance with the ethical principles for research with human participants by Samut Songkhram Provincial Public Health Office, COA No. 24/2022.

Statistical analysis

Statistical analyses were conducted using SPSS (SPSS Inc., Chicago, IL, USA) software for Windows. General information, overall health literacy scores in each sub-component, and COVID-19 prevention behavior were analyzed by descriptive statistics, with results presented as frequency, percentage, median, arithmetic mean (M), and standard deviation (SD). The relationship between health literacy and COVID-19 prevention behavior was examined using Pearson correlation coefficient (r). Linear regression was used to investigate whether health literacy was associated with COVID-19 prevention behavior after controlling for an important factor, age^{11,19-20}. For statistical tests, the significance level was set at 0.05.

RESULTS

General information

The research participants consisted of 425 VHVs in Samut Songkhram Province. Most were female (74.4%), mean age 56 years (SD = 12.25), married (59.3%), completed primary education (35.1%), had been working as VHVs for 14 years (SD = 9.67), had been infected with COVID-19 (55.8%), and had underlying diseases (58.6%) (Table 1).

Table 1. Demographic variables of VHVs (n=425).

Demographic variables	n (%)
1. Gender	
Male	109 (25.6)
Female	316 (74.4)
2. Age (years) [Mean±SD]	56.44±12.25
3. Marital status	
Single	75 (17.6)
Married	252 (59.3)
Divorced	18 (4.2)
Separated	18 (4.2)
Widowed	62(14.6)
4. Education	
Primary	149 (35.1)
Lower secondary	90 (21.2)
Upper secondary	127 (29.9)
Diploma	24 (5.6)
Bachelor/Master	35 (8.2)
5. Duration of working (years) [Mean±SD]	14.63±9.67
6. COVID-19 infection history	
No	237 (55.8)
Yes	188 (44.2)
7. Underlying disease	
No	249 (58.6)
Yes	176 (41.4)
8. Admitted to a hospital	
No	319 (75.1)
Yes	106 (24.9)

Participants' health literacy

Most participants had overall health literacy at an excellent level (63.3%), followed by a good level (25.6%), a fair level (9.9%), and a poor level (1.2%). The overall mean score of health literacy was at an excellent level (M = 98.46, SD = 12.22). Analysis of health literacy by each skill gave excellent levels for information access

skills (M = 16.14, SD = 2.64), cognitive skills (M = 16.26, SD = 2.61), decision-making skills (M = 16.02, SD = 2.58), communication skills for disease prevention (M = 16.20, SD = 2.65), self-management skills for disease prevention (M = 17.55, SD = 2.48), and media literacy (M = 16.30, SD = 2.43) (Table 2).

Table 2. Level of health literacy in VHVs. (n=425)

Dimension of health literacy	n (%)
1. Overall health literacy (Mean±SD)	98.46 ± 12.22
Excellent level	269 (63.3)
Good level	109 (25.6)
Fair level	42 (9.9)
Poor level	5 (1.2)
2. Accessibility skills (Mean±SD)	16.14 ± 2.64
Excellent level	282 (66.4)
Good level	74 (17.4)
Fair level	50 (11.8)
Poor level	19 (4.5)
3. Cognitive skills (Mean±SD)	16.26 ± 2.61
Excellent level	295 (69.4)
Good level	61 (14.4)
Fair level	64 (15.1)
Poor level	5 (1.2)
4. Decision skills (Mean±SD)	16.02 ± 2.58
Excellent level	284 (66.8)
Good level	72 (16.9)
Fair level	58 (13.6)
Poor level	11 (2.6)
5. Communication skills (Mean±SD)	16.20 ± 2.65
Excellent level	297 (69.9)
Good level	63 (14.8)
Fair level	51 (12.0)
Poor level	14 (3.3)
6. Self-management skills (Mean±SD)	17.55 ± 2.48
Excellent level	355 (83.5)
Good level	36 (8.5)
Fair level	28 (6.6)
Poor level	6 (1.4)
7. Media-literacy skills (Mean±SD)	16.30 ± 2.43
Excellent level	299 (70.4)
Good level	64 (15.1)
Fair level	56 (13.2)
Poor level	6 (1.4)

Participants' COVID-19 prevention behavior

Most participants showed COVID-19 prevention behavior at an excellent level (53.6%), followed by a good level (38.1%),

a fair level (8.0%), and a poor level (0.2%). The mean score of overall COVID-19 prevention behavior was at an excellent level (M= 3.45, SD = 0.65), as seen in Table 3.

Table 3. Level of COVID-19 prevention behaviors in VHVs (n=425).

COVID-19 prevention behavior	n (%)
COVID-19 prevention behavior score (Mean±SD)	72.8 ± 7.9
Excellent level	228 (53.6)
Good level	162 (38.1)
Fair level	34 (8.0)
Poor level	1 (0.2)

Relationship between health literacy and COVID-19 prevention behaviors among VHVs

The Pearson correlation coefficient revealed a positive relationship between overall health literacy score and COVID-19 prevention behavior score ($r = 0.103$, p -value = 0.034). After adjusting for age in

years, overall health literacy score was significantly associated with COVID-19 prevention behavior score (Beta = 0.146), as shown in Table 4. Each one-point increase in overall health literacy score increased COVID-19 prevention behavior score by 0.094 points.

Table 4. Relationship between health literacy (HL) and COVID-19 prevention behaviors in VHVs using linear regression.

Model	Factor	Unstandardized coefficients		Standardized coefficients	95% CI for B	P-value
		B	SE	Beta		
Unadjusted	Overall HL (scores)	0.066	0.031	0.103	0.005 – 0.127	0.034
Adjusted*	Overall HL (scores)	0.094	0.031	0.146	0.034 – 0.154	0.002

*Adjusted for age (years).

DISCUSSION

Results indicated that 63.3% of the participants had an excellent level of health literacy. This is because VHVs perform public health duties and care for people in local areas under their direct responsibility. They continuously receive knowledge and information from public health personnel to promote and support the government policy to become VHVs 4.0, with emphasis placed on health literacy development and transformational healthcare leadership. This result concurred with a previous study¹¹ showing that 75.1% of the VHVs had overall health literacy at an excellent level, consistent with Jaikham et al. (2021) who studied health literacy and health promotion behavior among 334 VHVs in Lamphun Province, with 44.31%²¹ having overall health literacy at an excellent level.

Most participants (53.6%) had an excellent level of COVID-19 prevention behavior, as they worked closely with disease sufferers. They received updated knowledge and information from public health personnel and promoted COVID-19 prevention behavior through public health personnel training programs. This result concurred with Wongti (2021) who studied factors affecting COVID-19 prevention behavior among 394 VHVs in Sukhothai Province. Findings revealed that majority of VHVs (89.60%)¹⁷ had an excellent level of COVID-19 prevention behavior. Similarly, Nawsuwan et al. (2020) also found VHV COVID-19 prevention behavior at an excellent level²². The VHVs played a vital role in monitoring and controlling COVID-19 according to guidelines introduced by the Ministry of Public Health through home visits,

screening by checking temperature, teaching and providing knowledge to people, and reporting operational performance on a daily basis²³.

In terms of relationship, it was found that health literacy was positively correlated with COVID-19 prevention behaviors COVID-19. This could be because VHVs had access to channels to receive information that they used to promote education and disease surveillance. Before starting work, VHVs were evaluated for their knowledge and understanding of changing attitudes and motivations to create appropriate health behaviors according to the concept of Nutbeam²⁴. It is also in harmony with the conceptual model of the Health Education Division, Department of Health Service Support that encourages people to achieve health literacy and strengthen their abilities for self-caring to keep pace with rapidly changing situations or environments¹⁰. Our findings are consistent with a previous study in VHVs which found that health literacy was statistically significantly related to self-protection behavior from the COVID-19¹¹. Similarly, Kotpan and Junnua²⁵ found that overall health literacy had a statistically significant positive correlation to coronavirus 2019 preventive behaviors among the Thai general population in Mukdahan Province, and Nilnate et al.²⁶ found that accessibility skills, decision skills, and applied skills were associated with a high level of COVID-19 preventive behaviors in working-aged people in Nakhon Ratchasima Province. Health literacy is associated with knowledge, motivation, and the ability to access, understand and use health information in everyday life²⁷. In this regard, VHVs who have excellent levels of health literacy and follow proper disease prevention behavior can take care of people by effectively monitoring and controlling diseases.

RECOMMENDATIONS

The study results can be used to enhance health literacy and COVID-19 prevention behavior, especially among VHVs who work directly with public health officials and local residents. COVID-19 monitoring and control were conducted in accordance with guidelines issued by the Ministry of Public Health. However, this study had certain restrictions as it only covered Samut Songkhram Province. Future studies should cover a larger area and investigate more comprehensive factors affecting health literacy levels to develop higher VHV health literacy at the national level.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflict of interest.

AUTHOR CONTRIBUTIONS

NS and TC contributed to the study conception and design. Material preparation, data collection, and analysis were performed by KS, WB, WMK, and SS. The first draft of the manuscript was written by NS, PO, and TC commented on previous versions of the manuscript. All authors read and approved the final manuscript.

REFERENCES

1. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. *Lancet*. 2020; 15;395(10223):470-3. doi: 10.1016/S0140-6736(20)30185-9.
2. World Health Organization. WHO Coronavirus (COVID-19) dashboard [Internet]. [cited 2022 Jun 29].

- Available from: <https://covid19.who.int/>
3. Dryhurst S, Schneider CR, Kerr J, Freeman ALJ, Recchia G, van der Bles AM, et al. Risk perceptions of COVID-19 around the world. *Journal of Risk Research*. 2020;23(7-8):994-1006. doi: 10.1080/13669877.2020.1758193
 4. World Health Organization. Coronavirus disease 2019 (COVID-19) situation report [Internet]. 2020[cited 2022 Aug 15]. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>.
 5. Fakhira AD, Pawitra AS, Diyanah KC, Wikurendra EA, Nagy I, Abdeljawad NSM. Awareness of Doing 3M (Wearing Mask, Physical Distancing, Washing Hands) During Pandemic Era in Rural and Urban Families. *Jurnal Kesehatan Lingkungan*. 2021;13(2):94-101. doi: 10.20473/jkl.v13i2.2021.94-101
 6. Doung-Ngern P, Suphanchaimat R, Panjangampattana A, Janekrongtham C, Ruampoom D, Daochaeng N, et al. Case-Control Study of Use of Personal Protective Measures and Risk for SARS-CoV 2 Infection, Thailand. *Emerg Infect Dis*. 2020;26(11):2607-16. doi: 10.3201/eid2611.203003
 7. Kaeodumkoeng K. Health literacy processes, practices, evaluation tools. 1st ed. Bangkok: Ideol Digital Print; 2021.
 8. Health Education Division. Nonthaburi: Planning and Assessment Group; 2021- Summary of Health Literacy and Behavior Assessment Results Health of the people in the target group (working and school age) [Internet]. 2021[cited 2022 Jan 17]. Available from: file:///C:/Users/AHS/Downloads/24022022101700244_6_linkhed.pdf
 9. Chinapong S, Kaosanit P. Health literacy, Health behaviors, and Physical Activities of North Bangkok University Undergraduate Students. *J Health PhyEd Rec*. 2020;46(2):56-67.
 10. Department of Health Service Support. A New generation of VHVs. Nonthaburi: Ministry of Public Health; 2011.
 11. Yaowakul D, Abdullakasm P, Maharachpong. Health Literacy on Coronavirus disease 2019 Prevention behaviors of Village Health Volunteers in Region 6 Health Provider. *RDHSJ*. 2022;15(1):257-72.
 12. Geboers B, Reijneveld SA, Jansen CJ, de Winter AF. Health Literacy Is Associated With Health Behaviors and Social Factors Among Older Adults: Results from the LifeLines Cohort Study. *J Health Commun*. 2016;21(sup2):45-53. doi: 10.1080/10810730.2016.1201174
 13. Choompunuch B, Suksatan W, Sonsroem J, Kutawan S, In-udom A. Stress, adversity quotient, and health behaviors of undergraduate students in a Thai university during COVID-19 outbreak. *Belitung Nursing Journal*. 2021;7(1):1-7. doi: <https://doi.org/10.33546/bnj.1276>
 14. Konsnan W, Poum A. Health Literacy Associated with Preventing and Controlling Behavior of Dengue Hemorrhagic Fever among Village Health Volunteers in Nong Yai Sub-district Orasat District, Surin Province. *JHSCPH*. 2022;5(1):35-44.
 15. Javadzade, SH, Sharifirad, G, Radjati, F, Mostafavi, F, Reisi, M, Hasanazade, A. Relationship between health literacy, health status, and healthy behaviors among older adults in Isfahan, Iran. *J Educ Health Promotion*. 2012;1:31.
 16. Bennett IM, Chen J, Soroui JS, White S. The contribution of health literacy to disparities in self-rated health status and preventive health behaviors in older adults. *Ann Fam Med*. 2009;7(3):204-11. doi: 10.1370/afm.940
 17. Wongti S. Factors Affecting Preventive behavior for Coronavirus disease 2019

- among Village Health Volunteers, Sukhothai Province [dissertation]. Phitsanulok: Naresuan University; 2021.
18. Health Education Division. Assessment form for health literacy and health behaviors of working-age people in villages to modify health behaviors. Ministry of Public Health [Internet]. 2020. Available from: <http://www.hed.go.th/linkHed/403>
 19. Pasion R, Paiva TO, Fernandes C, Barbosa F. The AGE Effect on Protective Behaviors During the COVID-19 Outbreak: Sociodemographic, Perceptions and Psychological Accounts. *Front Psychol.* 2020;11:561785. doi: 10.3389/fpsyg.2020.561785
 20. Pothisa T, Ong-Artborirak P, Seangpraw K, Tonchoy P, Kantow S, Auttama N, et al. Knowledge of COVID-19 and Its Relationship with Preventive Behaviors and Vaccination among Adults in Northern Thailand's Community. *Int J Environ Res Public Health.* 2022;19(3). doi: 10.3390/ijerph19031521.
 21. Jaikham J, Wungrath J, Thongprachum A. Health Literacy and Health Promoting Behaviors Regarding to 3E.2S. (Eating, Exercise, Emotion, Stop Smoking and Stop Alcohol) Among Village Health Volunteers in Ban Hong District, Lamphun Province. *JOHSS.* 2021;8(2):1-24.
 22. Nawsuwan K, Singweratham N, Damsangsawas N. Correlation of perception disease severity to implementation role for control of COVID-19 in communities among village health volunteers in Thailand. *Bamras J.* 2020;14(2):92-103.
 23. Department of Health Service Support. Organization of the VHVs system and the public sector for local quarantine and home quarantine. Nonthaburi: Ministry of Public Health. 2020.
 24. Nutbeam D. Health literacy as a public health goal: A challenge for contemporary health education and communication strategies into the 21st century. *Health Promotion International* 2000;15(3):259-67.
 25. Kotpan K, Junnua N. Associated between Health Literacy and Coronavirus Disease 2019 Prevention Behavior among People in Mukdahan Province. The 16th National Academic Conference grants research during 11-12 July 2022 at Ubon Ratchathani University and Research and Innovation for Sustainable Development Goals in the Next Normal. p.148-60.
 26. Nilnate N, Proasomsuk S, Prasit N, Nilnate P, Yotha N, Thammasarn K. Health Literacy and COVID-19 Preventive Behaviors among the Working-Age Population in Nakhon Ratchasima Province. *Health Sci J Thai.* 2022;4(4):10-8.
 27. Sørensen K, Van den Broucke S, Fullam J, Doyle G, Pelikan J, Slonska Z, et al. Health literacy and public health: a systematic review and integration of definitions and models. *BMC Public Health.* 2012;12:80. doi: 10.1186/1471-2458-12-80.