

LESSONS LEARNED AND THE POTENTIAL OF THAI VHVS ON THE EFFECTIVENESS OF COVID-19 CONTROL: A CROSS-SECTIONAL STUDY

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ABSTRACT

The current COVID-19 pandemic is emerging disease and continuing increase, this study aimed to explore and test associations between health literacy (HL) and COVID-19 prevention behavior, including Lessons Learned among Village Health Volunteers (VHVs) in 8 sub-districts in the community building community happiness project area of Regional Health 7, Thailand. A cross-sectional, self-report questionnaire study and focus group discussion was conducted in July 2020-May 2021 with 359 participants. Pearson correlation statistics and multiple linear regressions were used to test the association between factors. A qualitative study was used by group discussion and in-depth interview. The results found that; About 87.2% were females, completed secondary school (61.2 %). 71.9% can search, read and share information by online and received Covid19 information from online, television and health workers more than 10 time (46.8%). They participated with disease control activities over 85%. HL level were high (Mean 3.81 ± 0.77) and sufficient (Scores ≥ 3.61 , 64.6%), prevention behaviours were suitable (Mean $=3.72\pm 0.58$), but some behaviour may be at risk of infection include rubbing the eyes, picking the nose or touching the face without washing hands, socialize and talk closely with friends, go to crowded places without wearing masks or coughing and sneezing without covering the mouth and nose. There was a high correlation of VHVs' literacy and prevention behaviour with statistical significance (p value < 0.01). Although the community participation for prevention and disease surveillance system has a strengthen, and the VHVs have a good role, but the main problem of people was also mistake beliefs and attitudes about vaccination resulting in a low injection coverage rate. This will be providing public relations media and educate the people for correct understanding about causes, severity, prevention, adequate supply of medical personnel and VHVs. particularly, getting vaccine for immunity.

Keywords: Health literacy; COVID-19; COVID-19 prevention behaviors; Village health volunteers (VHVs); Lessons learned COVID-19 control of Thailand.

INTRODUCTION

COVID-19 is a new emerging disease that destroys the way of life, economic system, and work of people around the world. Thailand has a continuous epidemic of COVID-19 and has been 121st of world ranking. The COVID19 data report on 31st August 2021 was 1,175,866

cumulative confirmed cases, 14,355 new cases, 11,495 cumulative deaths (0.96 percent), while 5,003 cases were severe cases (1,042 wearing ventilators). Most of them lived in Bangkok and metropolitan area, meanwhile, the Northeast region was ranked at 3rd with the highest number of cases. (DDC, 2021)

Thailand has established the Center for COVID-19 Situation Administration (CCSA) with Prime Minister General Prayut Chan-ocha as the meeting director and team as a spokesperson for presenting news events on television, radio or online newspaper, etc. The measures to control the disease include: Legal for government administration in emergency situations infectious disease control (Stage quarantined/ lockdown), allocating budgets for the provision of medicines, necessary preventive equipment, vaccines and therapeutics for this novel coronavirus and assistance to people in distress, particularly economic recovery business, particularly adjusting the health system to facilitate effective disease prevention and control both the health service system at each level of the hospital able to care/promoting health behavior for disease prevention (wearing mask) and deliver with quality, safety, with a structured rate of manpower to work sufficiently. But problems and obstacles discovered include a lack of cooperation, namely, non-wearing of masks, non-social distancing, apparatus and equipment - a deficiency of instruments and equipment, people lack the understanding of COVID -19 communicable disease, insufficient budget, and insufficient medical personnel Wittaya Chinnabutr and Naphat Phakdisorawit (2021).

Health Literacy refers to individual competences to access, understand, appraise and apply health information and services to make appropriate health decisions (Lynn Nielsen-Bohlman et al., 2004; CDC, 2020), and is of concern to everyone involved in health promotion and protection, disease prevention and early screening, health care and maintenance, and policy making (Lynn Nielsen-Bohlman et al., 2004). But there is no a standard tool to assess HL at the regional and national level (Wimol Roma et al., 2018).

Primary Health care (PHC) in Thailand is one of the oldest in the world and is known worldwide for its success with 4 principles of 1) equitable distribution of health care 2) community participation 3) use of appropriate technology and 4) multisectoral approach, became as main context for PHC development in Thailand (The Primary Health Care Division, 2014). Supporting the concept of community involvement, the Village Health Volunteer (VHV) is the backbone of this health care delivery system, management, communicates and response to global and country epidemic situations across the country, there are more than 1,040,000 of VHVs (WHO, 2019). They have been developing the potential for surveillance, but COVID-19 is a new emerging disease that providing protection information or control the disease, despite having communicated and educated the public in many channels, It is imperative that the VHV has a good understanding of COVID-19 and is ready to be health leader in their community (Samroeng Yangkratok et al., 2020). But there has never been an assessment of HL, prevention behavior and association between factors. This study will show the ability and role of them to take action in the area. Including the study of lessons learned or policies or methods for surveillance, prevention and control of disease. The role of organizations in the community in the model area of community to create happiness that has been driven since 2019 by the Public Health Support Division Department of Health Service Support Ministry of Public Health in each province, 2 sub-districts, which are in the process of evaluating the outcomes occurring in the community. VHV on surveillance, prevention and control of COVID-19 and to study management lessons

both during the epidemic crisis and the remission period how it is done, by whom, and what is the result? Did it meet expectations? Are there any obstacles? For prevalence. The implications of this for health service provision, and control in Thailand are serious.

MATERIALS AND METHODS

Study Site

This study was carried out in 8 sub-districts in the community building community happiness project area of Regional Health 7 Thailand namely; Tumbol NongKaen, Amphur Phathomratana and Tumbol Sa-artsomboon, Amphur Muang, Roi-Et province; Tumbol None Khom , Amphur Phoophamarn and Tumbol None Kong, Amphur Ban Phang, Khon Kaen province; Tumbol Srisuk, Amphur Kantarawichai and Tumbol Por Pan, Amphur Nachuik, Mahasarakham province; Tumbol Nongtokpan, and Tumbol Ei Tue and Amphur Yang Talad, Kalasin province. The study was implemented with the agreement and support of the Governor, the chief of Provincial Health Office, the chief of Tambon Health Promotion Hospital and the village headman.

Study Design and Participants

This study used a cross-sectional survey design with self-answer questionnaire for HL and Covid19 prevention behavior then in-depth interview and focus group discussion for the lessons learned from Covid19 of VHV missions. A questionnaire survey was 359 participants selected using the multistage random sampling method among VHV in 8 areas who act in the community for at least six months. Each area was calculated by the random number proportionally.

Instrument and Data Collection

The questionnaire covered 2 main areas; 1) HL and COVID-19 prevention behavior among VHV 2) Lessons from Covid19 of VHV missions in the community.

The questionnaire was drafted based on Nutbeam's and European Health Literacy survey framework (1982) and was applied by Wimol Roma (2017). It was pre-tested for plain language with experts and 30 general people. And administered through self-answer questionnaire. Focus groups were conducted for qualitative analysis. The internal consistency reliability was confirmed by the Cronbach's alpha (Cronbach & Shavelson, 2004). All the Cronbach's alphas are 0.967 which indicates satisfactory internal consistency reliability for the whole questionnaire.

The data collection team was the researchers. All participants received a small souvenir after interviews. The participants were explained the purpose of the study, their rights to participate and assured them that their information would be kept confidential. Consent forms were handed out for all participants.

Statistical Analyses

All questionnaire data was checked, coded, rechecked and double entered into Excel spreadsheet database and then validated using Epi-Info (version 3.5.4). The data were then transformed and all data were analyzed using Stata (v 13.0). Descriptive statistics were used to describe demographic characteristics, HL and COVID19 prevention behavior. Suppose the number of cases of missing values, we omit those values from the analysis. Pearson's Chi-square test was used to determine whether there is a statistically significant difference between the disease prevention behaviors of epidemic and refractory periods and binary logistic regression was used to test the association between factors.

Ethical Reviews

This research proposal was reviewed and approved by the Mahasarakham University Ethics Committee for Human Research (No. 232/2563).

RESULTS

Social-Demographic and Covid19 Prevention Information Sources

Of the 359 participants, 87.2% were females, mean age 52.3 ± 8.2 years (range 31 to 79 years), 61.2 % completed high school and primary school (32.1%) respectively. 79.6% are farmer with income between 1,000 to 20,000 THB but almost 80% of them less than 10,000 THB

Their Covid19 information came from various sources, such as, television (37.9%), health personnel (46.5%) or internet (15.6%). They received more than 5 times (29.0%) to 10 times (46.8%), but most of them (71.9%) can't search, read and shared about COVID-19 information. Above of 85 % participated in activities for preventing COVID-19 outbreak in their community, such as, health education (wearing a face mask, washing hand, eating hot food, stay home when sick/ social distancing etc.). By knocking on the door every house (26.5%) including, set up checkpoints for screening diseases (market, religious ceremony at the hose house/ temple, school etc.) 24.0% (Table 1).

Characteristics	Number	%
Total participants	359	26.8
Female	313	61.6
Male	46	38.4
Mean Age 52.3, SD 8.2, Range 31-79 years		
Education level		
Unlettered	4	1.1
Primary school	115	32

High school	220	61.2
Diploma	10	2.8
Bachelor's degree	7	1.9
Postgraduate	3	0.9
Occupation		
Agriculture	281	78.3
Self-employ	47	13.1
Business	18	5
housekeeper	3	2.5
Government officer	4	1.1
Monthly income (n=339)		
Less than 5,000 (THB)	141	39.3
5,000-10,000 (THB)	137	38.2
10,000-20,000 (THB)	55	15.3
More than 20,000 (LAK) “ “	6	1.2
Range 1,000-40,000 (THB)		
Ability to search, read and share Covid19 information		
Can't do	258	71.9
Can do well	40	11.1
Sometimes yes, sometimes no.	61	17
Source of Information for Covid19 Learning		
Internet	56	15.6
Television	136	71.9
Health worker	167	46.5
Frequency of training about Covid19 control and prevention		
Less than 5 times	87	24.2
5-10 times	104	29
More than 10 times	168	46.8
Participated in activities for preventing COVID-19 outbreak in their community		
Not participate	53	14.8
Health education by knocking on the door every house	94	26
Groups screening for covid19	86	24
Covid19 prevention campaign in the community	95	26.5
Community development plan for Disease control	31	8.6

HL and Covid19 Prevention Behaviors

HL of VHV's for Covid19 management

Overall, the level of HL was medium (Mean=3.73, S.D. =1.07), However, separate 4 domains showed that; the individual competences to access health care service information were medium and Understanding health information and services were medium (3.58±1.07; 3.40 ±1.29), whereas, Appraising and applying health information and services and making appropriate health decisions were high (4.00±0.62; 4.24 ±0.52), (Table 2). Then was analyzed the item in each domain which had only low to medium level about accessing, searching the information in each item, 25-40% could do it in a low level and 65-75% were medium level, such as; accessing Covid19 report from billboards/ electronic media or social media; Knowing the source where presentation on disease and prevention; Searching and providing information on service resources for examination, treatment and health promotion for disease prevention and control for people in the community; Finding accurate information and to advice the people in community to buy medicines, supplements, herbs or products for preventing the spread of COVID-19 (mass face chill, alcohol) (44% had low level); Identifying and providing the details of resources of disease detection, treatment, and quarantine for COVID-19 or advising about COVID-19 prevention to people in the community (Table 3).

The level of HL	individual competences to access health care service information		Understand health information and services		Appraise and apply health information and services		Make appropriate health decisions	
	n(%)	\bar{X} (S.D.)	n(%)	\bar{X} (S.D.)	n (%)	\bar{X} (S.D.)	n(%)	\bar{X} (S.D.)
high	211(58.9)	3.58	217(60.6)	3.4	233(65.1)	4	298(83.2)	4.24
Medium	62(17.3)	-1.07	53(14.8)	-1.29	123(34.4)	-0.62	58(16.2)	-0.52
Low	85(23.7)		88(24.6)		2(0.6)		2(0.6)	
Overall of HL of Covid19 level = 3.73,S.D.(0.49) (Moderate)								

Level was defined for scoring mean, as “Low”= 1.0-2.33, “Medium” =2.34-3.66 and “High” = 3.67-5.0)

Question	Number (%) of skill level	
	Low	Medium
1. Accessing Covid19 report from billboards/electronic media or social media	116 (32.4)	242 (67.6)
2. Knowing the source where presentation on disease and prevention	136 (38)	222 (62)
3. Searching and providing information on service resources for examination, treatment and health promotion for disease prevention and control for people in the community	90 (25.1)	268 (74.9)
4. Finding accurate information and to advice the people in community to buy medicines, supplements, herbs or products for preventing the spread of COVID-19 (mass face chill, alcohol).	159 (44.4)	199 (55.6)
5. To Identify and providing the details of resources of disease detection, treatment, and quarantine for COVID-19	91 (25.4)	267 (74.6)

6. To advice about COVID-19 prevention to people in the community.	114 (31.8)	244 (68.2)
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Level was defined for scoring mean, as “Low”= 1.0-2.33, “Medium” =2.34-3.66 and “High” = 3.67-5.0)

Practices Regarding Covid19 in the Outbreak and Disease’S Situation in the Country/Community

Table 4 reveals that, all of items of prevention practices were safe, but some behavior had a low score that may be at risk of infection, including, socialize and talk closely with friends or touch a face without washing hands and they Take antibiotic for preventing disease. Which is the cause of drug resistance use? When compared mean score between outbreak and undisturbed disease’s situation in the country/community, the mean score of undisturbed disease’s situation was decrease with significantly (P value<0.01) (Table 4).

Question	Practices level in each situation			
	Outbreak		undisturbed	
	\bar{X} (S.D)	Level of practice	\bar{X} (S.D)	Level of practice
1. Washing hands, use alcohol-based hand sanitizer	4.64 (0.54)	Safe	4.38 (1.10)	Safe
2. Wear a face mask when leaving the house. Or if you have a cough, sneeze or a cold, you'll always wear it when you're with other people in the house.	4.65 (0.64)	Safe	4.43 (0.89)	Safe
3. Use your elbow or other device when touching a lift button or push-in door.	4.06 (1.12)	Safe	3.99 (1.14)	Safe
4. Rub your eyes, pick your nose, or touch your face without washing your hands.	3.33 (1.63)	Safe	3.38 (1.62)	Safe
5. Socialize and have a close conversation with friends or others.	3.01 (1.43)	Safe	3.02 (1.53)	Safe
6. Staying home when you are risk	4.18 (1.10)	Safe	3.98 (1.17)	Safe
7. Quarantine Activities	4.59 (0.68)	Safe	3.57 (1.49)	Safe
8. Social Distancing	4.39 (0.96)	Safe	3.66 (1.44)	Safe
9. Going to crowded places without wearing a protective mask	3.69 (1.74)	Safe	3.55 (1.67)	Safe
10.Coughing and sneezing without covering the mouth and nose	3.50 (1.64)	Safe	3.50 (1.75)	Safe
11.Share a spoon, a glass of water, a cup and a plate with others.	3.57 (1.58)	Safe	3.31 (1.70)	Safe
12.Eating clean and hot food.	4.77 (0.57)	Safe	3.98 (1.59)	Safe
13.Always shower after in crowded places or you are risk	4.57 (0.82)	Safe	3.88 (1.52)	Safe
14.Take antibiotic for preventing disease.	3.06 (1.63)	Safe	3.25 (1.67)	Safe

Mean score of Covid19 prevention practices in community	N	\bar{x}	S.D	χ^2	P value*
Epidemic period	359	0.26	1.08	37.34	<0.01
Refractory period	359				

Level was calculated by Max. Value - min. value/ number of interval, defined for scoring mean, as “Low”= 1.0-2.33, “Medium” =2.34-3.66 and “High” = 3.67-5.0)

*Significant statistic <=0.05

Association between HL and Practices Related to Covid19 Prevention

The binary logistic regression reveals that, participants with high levels of HL and individual competences to access health care service information were likely to have proportionately safety practice related to Covid19 prevention (OR=0.21; CI=0.08-0.57; P value=0.02 and OR=0.03; CI=0.003-0.33; P value=0.004) (Table 5).

TABLE 5 ASSOCIATION BETWEEN HL AND COVID19 PREVENTION PRACTICES BY BINARY LOGISTIC REGRESSION (N=359)					
Overall of HL	Practice ^b				
	Risky (Number)	Safe (Number)	OR ^c	95% ^d	χ^2
Low	13	16	0.21	0.08-0.57	0.02*
high	112	218			
Individual competences to access health care service information^a					
Low	2	91	0.03	0.003-0.33	0.004*
high	25	241			
Understand health information and services^a					
Low	4	93	0.40	0.04-3.92	0.43
high	23	239			
Appraise and apply health information and services^a					
Low	1	23	1.63	0.11-24.11	0.72
high	26	309			
Make appropriate health decisions^a					
Low	1	8	1.30	0.12-14.37	0.83
high	26	324			

^aLevel of HL& 4 domain of HL was defined as “Low” for score =3.0 and high for 3.01-5.0

^bLevel of practice (P) was also defined as “Safe” for score = 3.0 and high “Risky” for those scoring = 3.01-5.0

^{a,b}was calculated by Max. Value - min. Value/ number of interval

^cOR = Odds ratio. ^dCI = Confidence interval of OR.

^eSignificant statistic ≤ 0.05

Roles, Missions and Process of Developing the Potential of the VHV's for Covid-19 Control and Surveillance

The work to prevent COVID-19 in communities is carried out by three organizations: (1) the district and sub-district health promoting hospitals (2) local government organization and (3) the communities' organization. Thailand has adjusted the health service system to facilitate the management of the control of COVID-19, by public and private health service units at the provincial, district or sub-district level.

In Thailand, VHVs was one of key success factors in relieving the spread of COVID-19. During the pandemic, includes:

1. Promoting and educating individuals in the community on health promotion and prevention against COVID-19 and taking care of their own health by knocking the door (e.g., wearing masks, washing hands, social distancing and getting vaccinated)
2. Supporting local surveillance system e.g., proactive screening in the crowded area for early detected cases with immediate reporting. Monitoring follow-up on treated individuals and assisting health workforce and individuals (food, medicine delivery and emotional support that impact from the outbreak)
3. Supporting health professionals and facilitating collaboration between health and non-health sectors at local level for controlling the disease and Survey of vaccination target groups and individual assessment of Adverse Events Following Immunization (AEFI) after vaccination.
4. Joined to create social measures in their community according to a new way of life (New Normal).

However, many VHVs perform various roles and activities, such as being Care Giver (CG), who care for people with dependency conditions and follow-up the chronically ill patients. Therefore, the VHVs must manage in many jobs including taking care of the family and to be able to operate effectively. The process of developing the potential of the VHV, including:

1. Educating about diseases, prevention, roles and duties and report on performance at least once a month.
2. Rehearse the plan on the table by simulating an outbreak.
3. Knowledge Sharing and knowledge management with colleague.

The problems discovered include a lack of cooperation of population, such as, non-wearing of masks, non-social distancing, non-vaccinated and deficiency of instruments and equipment, insufficient budget, and medical personnel.

Guidelines for further action by:

1. Campaign to communicate and publicize the public to know the situation of the disease continuously
2. Educate and motivate Encourage people to have appropriate disease prevention behaviors
3. Screening for disease Situation report/accurate information and investigate all cases if any suspected or confirmed disease is found
4. Provide enough materials to work, increased support of government budget.

DISCUSSION

The World Health Organization Thailand (WHO, 2020) has praised Thailand's system and measures to prevent and successfully control COVID-19. Dr. Daniel Kertesz, who works

with WHO said that “They do well without ostentation” (<https://www.who.int/thailand/about-us/head-of-who-office>). The key success factors is having a strengthen primary health care system, particularly in empowering individuals and communities to become resilient on health issues. A community resilience paradigm can help communities and individuals not just to mitigate damage and heal, but to thrive (Katharine Wulff et al., 2015) which has been continuously community health development for more than 4 decades (Phudit Tejavivaddhana et al., 2020). VHVs as an important mechanism to drive public health mission effectively, particularly, the role in response to the COVID-19 outbreak using a variety of methods and from the high participated of all parties are proactive surveillance (Yaowaluk Chaobanpho, 2021) by; 1) issuing primary screening for diseases, providing health education and health promotion proper disease prevention by in each household, school, market and community merit-making events, protecting in elderly people or patients whom be risk infected, including checking inaccurate news to build confidence among the people in the community 2) treatment at early sign of symptoms and online surveillance for local-quarantined individuals and reporting to Sub-district Hospital that they can be appropriately examined, analyzed, management and reported to the next level of agencies (ThaiPBS, 2020; Hfocus, 2020; Phudit Tejavivaddhana et al., 2020; MOPH, 2021; Yaowaluk Chaobanpho, 2021). About solving problems in the first wave of outbreaks, there are deficiency of instruments and equipment (Sorawut Iamnui, 2021; Yaowaluk Chaobanpho, 2021), together they sew fabric masks for their own use, use herbs to make hand sanitizer or 4) cooperate with other organizations and people in the community, such as monks, to provide care and assistance to patients/survivors in physical, mental, emotional and social aspects in food supply and delivery medications or herbal remedies for patients and those detained in detention centers, etc. So, strengthening health systems might serve as a sustainable paradigm for organizing public health and medical preparedness, response, and recovery. Thus, community resilience resonates with a wide array of stakeholders, particularly those whose work routinely addresses health, wellness, or societal well-being (Katharine Wulff et al, 2015).

Health literacy is the degree to which individuals have the ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others (CDC, 2020) and is of concern to everyone involved in health promotion and protection, disease prevention and early screening, health care and maintenance, and policy making (Lynn Nielsen-Bohlman et al., 2004). This study explored and tested associations between health literacy (HL) and COVID-19 prevention behavior among VHVs. (Division of Health Education, 2018; Visanuyothin S et al., 2015) studied about VHVs’ HL of health care had a good level and very good level about health practice behaviors, but this study found that, most VHVs are knowledgeable at a very high level, even though they are not all the same result, cause of they have training in COVID-19 prevention more than five to ten times, always work-based training in the field and getting more information with many channels such as LINE, Facebook, and searching from various websites at any time. When classified by the same constituents as the study of Division of Health Education (2018), shown a high level in the 3 components (accessing health information and services, and the most in the decision-making component. But of the Health Education Division, it was found that it was at a poor level in accessing health information and services, while the knowledge and understanding of health was at a high level. And the correct discrimination decision was at the highest level (Division of Health Education, 2018) which is in the same direction. But having studied the knowledge of Volunteers in the

prevention of COVID-19 at Nakhon Ratchasima Province (Phatthaphon Jungsomjatepaisan & Santi Thuaymiti, 2021) also found that; they had a high level of knowledge as well. Although it is not profound in showing talent or showing knowledge, but will see that the knowledge of the VHV was at a good level as well. When studying behaviors for preventing COVID-19, it was found that; most of them had appropriate disease prevention behaviors at the very highest level and has a good role in disease control in the community. This is consistent with the study by Supachaya Phawangkarat and colleagues (2020) which found that the disease prevention behaviors were at a high level. Self-defense behaviors during the lockdown policy period were significantly better than during the relief measures (P value < 0.05), indicating compliance with surveillance measures and preventing the disease that has decreased continuously, causing the chances of a new wave of outbreaks in the country to increase. Therefore, health agencies should create VHVs to concern and awareness and work Programme includes capacity building for being health leaders and promote participatory action and social responsibility for people in implementing community measures for disease prevention and continue to be a new way of life.

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