

HEALTH WORKERS' CAPABILITY, OPPORTUNITY, MOTIVATION, AND BEHAVIOR TO PREVENT AND CONTROL COVID-19 IN A HIGH-RISK DISTRICT IN THAILAND

Suttida Sangpoom^{1,3}, Femi Adesina², Joenathan Saetang³, Nittaya Thammachot³, Kawintida Jeenuang^{3,4}, Charuai Suwanbamrung^{3,4}

¹School of Science, Walailak University, Nakhon Si Thammarat Province, Thailand

²Department of Biology, Federal University of Technology Akure, Ondo State, Nigeria

³School of Public Health, Walailak University, Nakhon Si Thammarat Province, Thailand

⁴Excellent Center for Dengue and Community Public Health: EC for DACH, Walailak University, Thailand

ABSTRACT

Background. Village health volunteers have been an important group who plays the role in prevention and control of COVID-19 pandemic situations at primary care units, Thailand.

Objective. The objective of this cross-sectional analytic study was to assess the level and analyze the association between personal information, capability, opportunities, motivations, and behaviors to prevent and control COVID-19 among Village healthy volunteers in a high risk district, Southern Thailand.

Material and Methods. G*power program was used to calculate the sample size of 145 VHVs recruited for this study. Data collection was done using a well-structured questionnaire with 5-point Likert scale for capability, opportunities, motivations, and behaviors component, and multi-stage sampling of 18 sub-district health promoting hospitals was carried out. Data analysis was done using descriptive, *Chi-square* and *Fisher* Exact test.

Results. Majority (89.7%) of the VHVs were female, and 62.8% were 28-59 years old. More than half, 55.9% (81) have been VHVs for 11-36 years. Generally, higher capacity was found among 59.3% (86) of the VHVs, low opportunity level among 81.4% (118), high motivation among 53.8% (78) and a good behavior towards the prevention and control of COVID-19 among 72.4% (105). The VHVs' age and duration of practicing were significantly ($P < 0.01$ and $P < 0.05$ respectively) associated with COVID-19 prevention behavior ($\chi^2 = 6.894$ and 5.255 respectively). Likewise, there are significant association between capacity ($p \leq 0.001$ and $\chi^2 = 31.014$), opportunity ($p \leq 0.05$ and $\chi^2 = 9.473$), motivation ($p \leq 0.001$ and $\chi^2 = 0.0001$) and VHVs' behaviour to prevent and control COVID-19.

Conclusion. VHVs' opportunity is very low in the study area and it negatively affects good behavior for the prevention and control of COVID-19. All stakeholders in the district can use the association among the capability, opportunity, motivation and behavioral model to develop practice guideline and set policy for preventing COVID-19 in the community.

Key words: COM-B, COVID-19, behavioural change, village health volunteers, Thailand

Abbreviations: PHOs – public health officers; COM-B – capability, opportunity, motivation and behavior; COVID-19 – coronavirus disease 2019; VHVs – village health volunteers.

INTRODUCTION

Coronaviruses belong to the family Coronaviridae and this group of viruses differs, infecting a wide range of animals [1] and therefore many are zoonotic diseases. In 2002, a severe acute respiratory syndrome coronavirus (SARS-CoV) which is highly pathogenic was diagnosed in human and in late 2019, a novel strain that is called SARS-CoV-2 emerged in human from Wuhan town in China [1, 2]. SARS-CoV-2 is the cause of COVID-19 (Coronavirus disease 2019) which

becomes a pandemic that overwhelms the health system of the world [3, 4] Between 2019 and 2022, several variants of COVID-19 have been detected in man such as alpha, delta, beta, gamma and omicron that are of serious health concern because of their high rate of transmission and reinfection occurrence within the population [5, 6]. The disease is associated with mild to severe illness such as fever, anosmia, fatigue aches, dry cough, pains, sore throat, headache, nausea, diarrhea, vomiting, conjunctivitis, skin rash, shortness of breath and blood clots in the lungs [7, 8,

Corresponding author: Charuai Suwanbamrung, School of Public Health, Walailak University, Nakhon Si Thammarat Province, Thailand, e-mail: scharuai@wu.ac.th or yincharuai@gmail.com

This article is available in Open Access model and licensed under a Creative Commons Attribution-Non Commercial 3.0 Poland License (CC BY-NC) (<http://creativecommons.org/licenses/by-nc/3.0/pl/deed.en>)

Publisher: National Institute of Public Health NIH - National Research Institute

9]. The many months of isolation, stay-at-home and social distance also causes anxiety, despair, loneliness, mental health issues and economic downfall [10, 11].

According to WHO [12], the present number of COVID-19 cases has reached 637,404,847, with 6,608,893 confirmed death, globally. In Thailand, the number of cases recorded is 4,707,244 while death cases are 33,180 between January, 2020 to November, 2022. The Kanchanadit District is one the districts in Surat Thani Province in Thailand. Information gotten from Kanchadit district office revealed that from 2020 to 2021, the district's high incidence rate of COVID-19 infections increased from 0.0003% (3 affected people) to 3%. (2,751 infected people). Although death cases were not reported, but the incidence rate of infection and the effects of the pandemic condition were high.

Health professionals are proactive change agents whose knowledge has been found to help safeguard a population from viral epidemics [13]. Health workers who provide treatment for COVID-19 patients have been reported to have greater rates of sadness, anxiety, sleeplessness, distress and mental pressure compared to other healthcare professionals, due to COVID-19's highly infectious nature and lack of specific vaccine for treatment [14, 15, 16]. *Chen et al.* [17] also opined that doctors, nurses and other health workers are dealing with mental health issues due to this pandemic. With the above mentioned challenges, there is a need for the implementation of healthy behavioural theory among health workers to successfully prevent the spread of the disease. Many researchers have offered crucial behavioral benchmarks for the prevention and reduction of pandemics like COVID-19 [18, 19].

There is a growing acknowledgment that public health interventions are more likely to be successful if they are based on the most reliable and high-quality behavioral science theories [20, 21]. The "capability-opportunity-motivation-behavior (COM-B) paradigm" is a straightforward, all-encompassing approach to analyzing behavior [19]. It is a point to note that it depends on an individual's capacity, opportunity, and motivation to fully engage in an activity, and either directly or indirectly these three components relate to and influence one another to produce good conduct or behavior in delivering professionally as a health worker [22]. In buttress, *Miller et al.* [23] also confirmed that during the early outbreak in England, individual hygiene (which is a behavioural act) was influenced by competence (capacity), opportunity and motivation.

Village health volunteers (VHV) in primary health care actions in Thailand, are an important working group who take the role for prevention and control the spreading of COVID-19. Their responsibility included screening individuals in each household with particular focus on those who traveled back

from foreign countries or high-risk areas at national level. The VHVs contacted primary care units in their working areas for referral of cases needing medical attention. Also, VHVs provided emotional support for individuals to mitigate mental impact from the outbreak in their living areas and provided logistic service to improve access to medications for individuals with chronic conditions. Door-to-door assistance and close relationship between VHVs and local individuals promote compliance to national guidelines on prevention against and self-care for COVID-19 including hand washing, applying hand sanitizers, hygienic mask wearing, and social distancing [24].

There are scarce studies that are supported by evidence on capacity, opportunity and motivation for volunteering in the health system. In order to develop the behavior that assists in the design of disease prevention and control practices for village health volunteers, it is necessary to understand the level of behavior and associated factors. This study, therefore, applied the concept of COM-B model to assess the level and analyze the associated between personal information, capability, opportunities, motivations, and behaviors to prevent and control COVID-19 among Village health volunteers (not government health officers) in a high risk district, southern Thailand.

MATERIAL AND METHOD

This research design was a cross-sectional analytical study in Kanchanadit District, Surat Thani Province; the high risk area in Thailand. The district comprised 104,951 people, 40,646 households, 117 villages, 13 sub-districts, 2,468 village health volunteers, 18 primary care units (PCUs), a district hospital, and a district public health officer. The study was conducted from June to September 2021 with the approval of the Ethical Review Committee for Research Subjects (Approval number WUEC-21-206-01).

The sample size was calculated using G*Power program 3.1.9.4 from 2,468 village health volunteers. The effect size was 0.30 with medium effect resulting in a medium-sized sample, the significance level was 0.05 with a 95% confidence level, the test power (1- β err prob) was 0.95 and degree of freedom (df) equal to 1 [25]. The calculated sample size revealed 145 VHVs that were recruited.

Data collection was done using multi-stage sampling of 18 primary care units (PCUs) and sampling participants of each PCU was based on inclusion criteria such as: (1) village health volunteers with more than 1 year experience in the risk district and (2) available to take part in the research. While an exclusion criteria were: (1) VHVs that did not

complete the questionnaire, and (2) VHVs who felt uncomfortable while answering the questionnaire. The research objectives were explained to the participant, before taking their consent.

Measurement

This study designed a questionnaire with 51 questions based on literature research and divided into five parts. Part 1: Personal information was a checklist including 9 items. Part 2: Capability was 10 items of 5-point *Likert* scale (5 = most correct, 4 = very correct, 3 = moderately correct, 2 = little correct, 1 = least correct). Part 3: Opportunity (10 items). Part 4: motivation (10 items) questionnaires were on a 5-point *Likert* scale (5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, 1 = strongly disagree), which are all positive questions. Part 5: Behavior was on a 5-point *Likert* scale (5 = always, 4 = very frequently, 3 = sometimes, 2 = rarely, 1 = very rarely). The score of each aspect was divided into two levels based on cut-off point on 90% by applying the *Bloom's* cut-off point criterion [26]; the high level (45-50 points) and low level (1-44 points). The content validity index (CVI) of questionnaires part 2, 3, 4 and 5 were 0.90, 0.90, 1.00, 0.90, and 0.94 respectively. Reliability was applied to 30 VHVs with the same characteristics. The *Cronbach's* Coefficient of part 2, 3, 4, 5, and overall showed 0.76, 0.88, 0.84, 0.78, and 0.90 respectively.

Data analysis

The data from the completed questionnaires were subjected to statistical analysis. Personal information and the level of ability, opportunity, motivation, and

disease prevention behaviors were analyzed using descriptive statistics (percentage and frequency), and the association between personal data, ability, opportunity, motivation and behaviors of prevention and control COVID-19 was analyzed using *Chi-Square* and *Fisher* Exact test.

RESULTS

All the 145 VHVs completely filled their questionnaires and returned it. In Table 1, 89.7% (130) of the VHVs are female and more than half of them 62.8% (91) are 28-59 years old. Less than half of the VHVs 44.1% (60) are elementary school leavers and 57.9% (84) also involved in farming. More than half, 55.9% (81) have been VHVs for 11-36 years and the majority 89.0% (129) had taken the COVID-19 vaccine (*AstraZeneca*). It was 51.7% (75) of them that have taken the 2 doses of the COVID-19 vaccine and 86.2% (125) are willing to take the remaining dosage of COVID-19 vaccine.

VHV's capability to prevent and control COVID-19

VHV's capability to prevent and control of COVID-19 is shown in Table 2. Based on the 10 items, 59.3% (86) of the VHVs' capacity are high. Majority 64.1% (93) of the VHVs shows low level capacity for item 2. Item 5 the highest VHVs' capacity 70.3% (102), followed by item 10 (64.8% (94)), items 3 and 7 both have 62.1% (90).

Table 1. Personal information of the recruited village health volunteers (VHVs) (n=145)

Variables		Outcome (%)
Gender	Male	15 (10.3)
	Female	130 (89.7)
Age (years)	28 – 59	91 (62.8)
	60 years or more	54 (37.2)
Education level	Elementary school	60 (41.4)
	Secondary schools and above	85 (58.6)
Occupation	Farmer	84 (57.9)
	Not a farmer	61 (42.1)
Duration of VHVS (years)	3 – 10	64 (44.1)
	11- 36	81 (55.9)
COVID-19 vaccination uptake (<i>AstraZeneca</i>)	No	16 (11.0)
	Yes	129 (89.0)
Two (2) dose of COVID-19 vaccination uptake (<i>AstraZeneca</i>)	No	70 (48.3)
	Yes	75 (51.7)
More COVID-19 vaccinations	No	20 (13.8)
	Yes	125 (86.2)

Table 2. VHV's capability to prevent and control COVID-19

Capability to prevent COVID-19 (n=145)	Level n (%)	
	Low	High
1. Able to assess health status of yourself before entering the practice of control and prevention COVID-19	69 (47.6)	76 (52.4)
2. Able to take a history and initial symptoms of COVID-19, including travel history to high-risk areas, history of confirmed patient exposure, and respiratory symptoms: cough, runny nose, sore throat, no smell, rapid breathing, shortness of breath, or difficulty breathing and/or have a history of fever (higher than 37.5°C)	93 (64.1)	52 (35.9)
3. Capable of wearing mask as correct method such as 1) Wash your hands before touching the mask, 2) Inspect the mask for tears or holes, 3) Find the top side, where the metal piece or stiff edge is, 4) Ensure the colored side faces outwards, 5) Place the metal piece or stiff edge over your nose, and 6) Cover your mouth, nose, and chin	55 (37.9)	90 (62.1)
4. Able to wash your hands with soap or alcohol gel in the right way: wash your hands in 7 steps and take at least 20 seconds	68 (46.9)	77 (53.1)
5. Able to choose hot cooked and clean foods	43 (29.7)	102 (70.3)
6. Understanding that COVID-19 is contagious caused by SARS-CoV-2 virus	71 (49.0)	74 (51.0)
7. Understanding that COVID-19 can spread from person to person through the respiratory tract	55 (41.4)	90 (62.1)
8. Understanding that COVID-19 is a disease that is prevented and controlled by wearing a face mask, washing hands and social distancing	60 (41.4)	85 (58.6)
9. Understanding that the spread of COVID-19 can be prevented by wearing masks, washing hands and social distancing	64 (44.1)	81 (55.9)
10. Understanding that serious death hazard of COVID-19 due to lung infection and pneumonia	51 (35.2)	94 (64.8)
Total (Cut off point 90%)	59 (40.7)	86 (59.3)

Remark: Cut-off point capability to prevent COVID-19 of VHVs 90%: ≤ 44 point = Low, 45-50 point = High

VHV's opportunity to prevent and control COVID-19

In Table 3, the 10 items show that the opportunity level to prevent COVID-19 is majorly low among 81.4% (118) of VHVs. More than half of VHVs have low opportunity for all the items. The top 3 items, where VHVs have the highest opportunity are item 7 (48.3% (70)), item 9 (40.0% (58)) and item 8 (37.9% (55)). While the items with the number of VHVs having the lowest 3 levels of opportunity related to COVID-19 prevention are item 1 (89.0% (129)), item 2 (85.5% (124)) and item 4 (77.9% (113)).

VHVs' motivation to prevent and control COVID-19

Motivational levels to prevent COVID-19 are found to be high among 53.8% (78) of the VHVs (Table 4). The items with the number of VHVs having the highest levels of motivation are items 7 (78.6% (114)), followed by item 8 (71.7% (104)), items 9 and 10 are both having 68.3% (99) of VHVs. While 89.0% (129) of VHVs had low motivation levels for item 1 (64.8% (94)), item 2 (62.1% (90)) and item 3 (54.5% (79)).

VHVs' behavior to prevent and control COVID-19

It was found that most of the VHVs have a good level of behavior towards the prevention and control of COVID-19 when considering all 10 items (Table 5). The top 3 items with the highest number of VHVs having good level of behavior are item 1 (82.8% (120)), item 6 and item 7 are both 82.1% (119), and item 10 (75.2% (109)). The first three items, where the highest number of VHVs is having the poor level of behavior to prevent COVID-19, item 5 (43.4% (63)), item 11 (41.4% (60)), and item 4 (40.7% (59)).

The association between personal information, capability, opportunity, motivation and behavior to prevent and control COVID-19

Table 6 shows that the age and duration of VHVs was significantly ($P < 0.01$ and $P < 0.05$ respectively) associated with COVID-19 prevention behavior ($\chi^2 = 6.894$ and 5.255 respectively). Likewise, there are significant association between capacity ($p < 0.001$ and $\chi^2 = 31.014$) opportunity ($p < 0.01$ and $\chi^2 = 9.473$), motivation ($p < 0.001$ and $\chi^2 = 33.444$) and VHVs' behavior to prevent and control COVID-19 (Table 7).

Table 3. Opportunity to prevent and control COVID-19

Opportunity to prevent and control COVID-19 (n=145)	Level n (%)	
	Low	High
1. Opportunity to receive budgetary support for the provision of face masks, hand sanitizers, and face shields	129 (89.0)	16(11.0)
2. Opportunity to manage time adequately to find COVID-19 prevention information	124 (85.5)	21 (14.5)
3. Opportunity to obtain quality and adequate self-defense equipment, including face masks, hand sanitizers, and face shields	112 (77.2)	33 (22.8)
4. Opportunity to be trained on COVID-19 From healthcare workers, including public health scholars, doctors and nurses	113 (77.9)	32 (22.1)
5. Opportunity to purchase self-defense equipment from a clinic or store. Medical supplies include face masks, hand sanitizers, and face shields	98 (67.6)	47 (32.4)
6. Opportunity to perform duties in a subdivision health promoting hospital or community health center where preventive measures are taken COVID-19	92 (63.4)	53 (36.6)
7. Opportunity to work with following village health volunteers to strictly comply with COVID-19 prevention measures	75 (51.7)	70 (48.3)
8. Opportunity to work with people in areas that cooperate in implementing COVID19- prevention measures	90 (62.1)	55 (37.9)
9. Opportunity to behave in COVID-19 prevention and control. It is an example for other people in the area	87 (60.0)	58 (40.0)
10. Opportunity to behave according to the model healthcare workers in the implementation of COVID-19 prevention measures	91 (62.8)	54 (37.2)
Total (Cut off point 90%)	118 (81.4)	27 (18.6)

Remark: Cut-off point opportunity to prevent COVID-19 of VHVs 90%: ≤ 44 point = Low, 45-50 point = High.

Table 4. Motivation to prevent and control COVID-19

Motivation to prevent and control COVID-19 (n=145)	Level n (%)	
	Low	High
1. Believed that wearing a mask can prevent the infection of COVID-19	94 (64.8)	51 (35.2)
2. Believed that washing hands for at least 20 seconds can reduce the risk of contracting COVID-19	90 (62.1)	55 (37.9)
3. Believed that maintaining a distance of 2 meters between people can reduce the risk of contracting COVID-19	79 (54.5)	66 (45.5)
4. Believed that compliance with COVID-19 prevention measures Properly wearing masks, washing hands and social distancing helps reduce the spread of COVID-19	65 (44.8)	80 (55.2)
5. Believed that the role of VHVs is important in preventing the infection of COVID-19	76 (52.4)	69 (47.6)
6. Thought that all village health volunteers are important in preventing the spread of COVID-19 in the community	78 (53.8)	67 (46.2)
7. Thought that you need to wear a mask every time you leave the house	31 (21.4)	114 (78.6)
8. Thought that you need to wash your hands every time you touch surfaces, objects, things, at public places and before eating	41 (28.3)	104 (71.7)
9. Thought that you are necessary to maintain a distance of at least 2 meters while talking or with others	46 (31.7)	99 (68.3)
10. Thought that you are proud that the responsible community is safe from COVID-19	46 (31.7)	99 (68.3)
Total (Cut off point 90 %)	67 (46.2)	78 (53.8)

Cut-off point motivation to prevent COVID-19 of VHVs 90%: ≤ 44 point = Low, 45-50 point = High

Table 5. Behavior to prevent and control COVID-19

Behavior to prevent and control COVID-19 (n=145)	Level n (%)	
	Poor	Good
1. Wearing a mask while meeting others or out on duty	25 (17.2)	120 (82.8)
2. Using personal items such as glasses, cutlery, plates, towels, and clothes	58 (40.0)	87 (60.0)
3. Taking care of your health to be healthy always by exercising and eating nutritious food	54 (37.2)	91 (62.8)
4. Washing your hands with soap or alcohol gel every time you touch surfaces such as doorknobs, railings, etc.	59 (40.7)	86 (59.3)
5. Prevention behavior by washing your hands for at least 20 seconds with soap or hand sanitizer	63 (43.4)	82 (56.6)
6. Using the middle spoon when sharing meals with others	26 (17.9)	119 (82.1)
7. Choosing food that is freshly cooked and hygienic	26(17.9)	119 (82.1)
8. Avoiding travel to high-risk or crowded areas	43 (29.7)	102 (70.3)
9. Taking a social distance of 2 meters when conversing or sharing with others	46 (31.7)	99 (68.3)
10. Complying with the COVID-19 prevention measures with willingness to fulfill the role of VHVs	36 (24.8)	109 (75.2)
11. Performing duties according to the VHV policy, knocking on the door of the house, educate yourself about COVID-19 to the people in the area of responsibility	60 (41.4)	85 (58.6)
12. Performing duties by monitoring, surveillance and giving advice COVID-19 risk groups in the area of responsibility	49 (33.8)	96 (66.2)
Total (cut off point 90%)	25 (17.2)	120 (82.8)

Remark: Cut-off point behavior to prevent COVID-19 of VHVs 90%: ≤ 53 point = poor , 54-60 point = good

Table 6. Association between personal information and behaviors to prevent and control COVID-19

Personal information (n=145)	Behavior to prevent COVID-19		χ^2
	Poor	Good	
Gender			0.007 ^{ans}
Male	4 (2.8)	11 (7.6)	
Female	36 (24.8)	94 (64.8)	
Age (years)			6.894 ^{**}
28 – 59	26 (17.9)	89 (61.4)	
60 years or more	14 (9.7)	16 (11.0)	
Education level			0.853 ^{ns}
Elementary school	19 (13.1)	41 (28.3)	
Secondary schools and above	21 (14.5)	64 (44.1)	
Occupation			1.426 ^{ns}
Farmer	20 (13.8)	64 (44.1)	
Not a farmer	20 (13.8)	41 (28.3)	
Duration of VHVs role (years)			5.255 [*]
3 – 10	11(7.6)	51 (35.2)	
11 – 36	29 (20.0)	54 (37.2)	
COVID-19 vaccination			0.121 ^a
No	5 (3.4)	11 (7.6)	
Yes	35 (24.1)	94 (64.8)	
More COVID-19 vaccinations			1.790 ^{ns}
No	8 (5.5)	12 (8.3)	
Yes	32 (22.1)	93 (64.1)	

Remark: *Chi*-square statistics; ^{ns}Non Significant, *P < 0.05, **P < 0.01, *** P < 0.001,

^a Fisher Exact test statistics

Table 7. Associated between capability, opportunity, and motivation and behaviors to prevent COVID-19

Aspects	Behavior to prevent COVID-19		Total	χ^2
	Poor	Good		
Capability to prevent and control COVID-19				
Low	31 (21.4)	28 (19.3)	59 (40.7)	31.014***
High	9 (6.2)	77 (53.1)	86 (59.3)	
Total	40 (27.6)	105(72.4)	145(100.0)	
Opportunity to prevent and control COVID-19				
Low	39 (26.9)	79 (54.5)	118 (81.4)	9.473 ^{a**}
High	1 (0.7)	26 (17.9)	27 (18.6)	
Total	40 (27.6)	105(72.4)	145(100.0)	
Motivation to prevent and control COVID-19				
Low	34 (23.4)	33 (22.8)	67 (46.2)	33.444***
High	6 (4.1)	72 (49.7)	78 (53.8)	
Total	40 (27.5)	105(72.5)	145 (100.0)	

Significant: ^a Fisher Exact test Significant: *P < 0.05, **P < 0.01, *** P ≤ 0.001

Cut-off point Capability Opportunity and Motivation 90% : ≤ 44 point = poor, 45-50 point = good, Cut-off point behavior to prevent COVID-19 of VHV's 90%: ≤ 53 point = poor, 54-60 point = good

DISCUSSION

The overwhelming increased demand on healthcare facilities during COVID-19 outbreak brought on by an increase in new cases, and insufficient number of official health workers, made healthcare providers and the government to call out for volunteers to assist in the prevention and control of COVID-19 [27]. The Kanchanadit District in Surat Thani Province of Thailand is a high risk area for COVID-19, with 104,951 census population but having few district public health officers. This study has revealed that 2,468 villagers have volunteered in assisting the healthcare system of the district in the prevention and control of COVID-19. Among the 145 village health workers recruited for this study, the majority are female (89.7%). This is consistent with the *Omoronyia* et al. [28] that recorded a significantly higher number of community health workers that are female than male. Likewise consistent with the findings of *Anyanti* et al. [29] where female among the studied community health volunteers are more than male. According to United Nation Volunteer's research, women perform about 57% of all volunteer labor globally, and if informal volunteering is considered, women share rises to 59%. The decision of this set of gender to participate in volunteering may be influenced by individual characteristics, partner, families, and social customs in the community [30]. In this study likewise, more than half of VHV's are 28-59 years old with more than 11 years of practicing, and this indicates that they are mature adults that can take up responsibilities. The act of volunteering might be advantageous for this age group as it may give them

a kind of human connection, a way to be valuable to others, and a reason to live that could raise their self-confidence and overall mental and physical well-being [31].

The COM-B model analysis is essential for preventive intervention to be effective, and it is advisable to investigate the health workers' behavioral influences on their implementing preventative behavior [32, 33]. According to this theory, behavioral change can only occur when a person has the necessary capacity, opportunity, and/or motivation [23]. In this study, almost half (40.7%) of VHV's have a low level capacity in the prevention and control of COVID-19. This capacity pertains to VHV's knowledge about COVID-19, strength and skill to perform the expected roles. Many of the VHV's (64.1%) have low ability in terms of taking the history (travel history to high-risk areas and history of confirmed patient exposure) and knowing the initial symptoms (cough, runny nose, sore throat, no smell, rapid breathing, shortness of breath, or difficulty breathing) of COVID-19 cases. In addition, many VHV's do not have the understanding of how to wash hands following the 7 steps within at least 20 seconds, with soap or alcohol gel in the right way. Most importantly, almost half of the studied VHV's has low understanding that COVID-19 is contagious and can spread from person to person through the respiratory tract. This is inconsistent with the findings of *Anyanti* et al. [29], where at least 90% of the studied community health volunteers had a good knowledge about transmission route, clinical presentation, prevention and control of COVID-19. VHV's who have no or low understanding about

COVID-19 would be less likely to find implementation and compliance of preventive measures a priority. This observed low level in capacity among 40.7% of VHVs may be due to the fact that some of the VHVs (57.9%) are into farming as their primary occupation, so they have no fundamental knowledge or formal training on health. Again, this may be due to the fact that almost half (41.4%) of the VHVs have elementary school education. When compared this with Jung and Kim [34] study, the study showed COVID-19 preventive health behaviors to be increased with the increase in educational needs among nurse students. Meanwhile, *Kaweenuttayanon* et al. [35] reported that the village health volunteers do receive an intensive week of training in health education and promotion, disease prevention and basic medical treatment at local health centers, organized by Thai health authorities. The other VHVs (59.3%) with high capacity may have received a form of training, prescribed courses or attended "COVID-19 Volunteer Team" sessions that have equipped them with knowledge and skills to perform duties as specified by the Ministry of Public Health. Moreover, the result attested that there is a significant association between VHVs' capacity and their behaviour to prevent and control COVID-19. *Wakida* et al. [36] has also reported inadequacy in knowledge about the various mental disorders, causes and management among the majority of the primary care providers studied in rural Mbarara district, Uganda.

Majorly, the opportunity level of the studied VHVs to prevent and control COVID-19 was low (81.4%). This opportunity is defined as the VHV's social cues, conformity, time and resources for the prevention and control of COVID-19. For instance, almost 90% of the VHVs have no or limited support to obtain quality and adequate self-defense equipment; such as face masks, hand sanitizers, and face shields. They have low opportunity to be trained on COVID-19 by healthcare workers; public health scholars, doctors and nurses. In *Afari-Asiedu* et al. [37] study, some of the volunteer health workers in Ghana were motivated because of the skills training opportunity given that was also beneficial to their personal lives. Likewise *Kaseje* et al. [38] reported that continuous training gives Kenyan village health helpers sufficient motivation to continue volunteering in the absence of financial support. To ensure that the appropriate knowledge is shared among the VHVs, future training opportunities should be organized for them. Meanwhile, the majority of the VHVs create no or limited time to search for COVID-19 prevention information that can equip them with basic knowledge of the disease. This study has shown that opportunity is a significant determinant of VHVs' behavior to prevent and control COVID-19. In contrast, *Lydon* et al. [39] study shows

that opportunity was not a significant predictor for the hand hygiene behavior among health workers in Ireland, but said that it might serve as a predictor for healthcare systems with limited resources.

This motivation pertains to VHV's emotional regulation, self-consciousness, belief about capacity, roles and optimism about prevention and control of COVID-19. About half of VHVs have low motivation to prevent and control COVID-19. This occurrence of low motivation may be as result of low opportunity experienced by the majority of the VHVs because the COM-B model also stated that both capacity and opportunity also influence the making of motivation [40]. The studied VHVs are more motivated by the thought of wearing a mask every time before leaving their house, washing their hands every time they touch surfaces, objects, things, at public places and before eating, necessity to maintain a distance of at least 2 meters while talking or with others, and also been proud that they are responsible for the safety of their community from COVID-19. This later point was buttressed by *Afari-Asiedu* et al. [37] result where the volunteers deemed it as a pleasure to be chosen by community leaders and given the duty of assisting healthcare provision in the community. The feeling of achievement is an important factor in the promotion of volunteer work and, moreover, an important part of the motivation of volunteer works [17]. Meanwhile, many of the VHVs have low motivation about the believe that wearing a mask, washing of hands for at least 20 seconds, and maintaining a distance of 2 meters between people can prevent/reduce COVID-19 infection, and this may be due to the no or limited training received by this set of VHVs. It was also revealed that motivation is a determinant factor influencing VHVs' behavior to prevent and control COVID-19. Understanding volunteer motives and beliefs are crucial for healthcare management to create efficient volunteer recruiting and retention strategies, especially in light of the role that community volunteers play in healthcare delivery systems [37]. According to the Functional Motivation theory, people would start volunteering and keep doing so, as long as the roles/duties fit their motivational concerns [41].

CONCLUSION

This study has revealed that all three COM-B components are significantly associated with good behavior of VHVs in preventing and controlling COVID-19, with capacity having the highest impact on behavior. An almost third-quarter of the VHVs have a good level of behavior towards the prevention and control of COVID-19. Especially in wearing a mask while meeting others or out on duty, and avoiding travel to high-risk or crowded areas, as

well as complying with the COVID-19 prevention measures with willingness to fulfill the role of VHVs. Except opportunity components, both capacity and motivation components significantly improve good behavior in more than 50% of the VHVs. Apart from this, their age and duration of practicing as VHVs were significantly associated with COVID-19 prevention behavior. Education level does not influence the VHVs' behavior of preventing COVID-19 in this study. This is probably because applying to become a VHV does not have a distinction between occupations, as all professions can apply.

Acknowledgments

The authors sincerely thank all the public health officers in the Village Health Volunteers involved in the study for their assistance and support. This work was supported by the Excellent Center for Dengue and Community Public Health: EC for DACH, School of Public Health, Walailak University, Thailand.

Conflict of interests

The authors declare no conflict of interests.

REFERENCES

- Hu, B., Guo, H., Zhou, P. and Shi, Z. L.: Characteristics of SARS-CoV-2 and COVID-19. *Nat Rev Microbiol* 2021;19:141–154. <https://doi.org/10.1038/s41579-020-00459-7>.
- Cui, J., Li, F. and Shi, Z. L.: Origin and evolution of pathogenic coronaviruses. *Nat. Rev. Microbiol* 2019;17:181–192.
- Wu, Z., and McGoogan, J. M.: Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72314 cases from the Chinese Center for Disease Control and Prevention. *JAMA* 2020; 323(13): 1239–1242. doi:10.1001/jama.2020.2648.
- World Health Organization (2020). Coronavirus Disease 2019 (COVID-19) Situation Report –https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200226-sitrep-37-covid-19.pdf?sfvrsn=2146841e_2 (29.11.2022).
- Centers for Disease Control and Prevention: Variants of the Virus. Available <https://www.cdc.gov/coronavirus/2019-ncov/variants/index.html>. (29.11.2022).
- WHO Tracking SARS-CoV-2 variants. Available <https://www.who.int/activities/tracking-SARS-CoV-2-variants>. 2022a. (29.11.2022).
- Abayomi, A., Odukoya, O., Osibogun, A., Wright, O., Adebayo, B., Balogun, M., Abdus-Salam, I., Bowale, A., Mutiu, B., Saka, B., Adejumo, M., Yenyi, S., Agbolagorite, R., Onasanya, O., Erinosh, E., Obasanya, J., Adejumo, O., Adesola, S., Oshodi, Y., Akase, I. E., Ogunbiyi, S., Lajide, D., Erinoso, F. and Abdur-Razzaq, H.: Presenting Symptoms and Predictors of poor Outcomes among 2,184 Patients with COVID-19 in Lagos State, Nigeria. *International journal of infectious diseases: IJID: official publication of the International Society for Infectious Diseases* 2021;102:226–232. <https://doi.org/10.1016/j.ijid.2020.10.024>.
- Grant, M. C., Geoghegan, L., Arbyn, M., Mohammed, Z., McGuinness, L., Clarke, E. L. and Wade, R. G.: The prevalence of symptoms in 24,410 adults infected by the novel coronavirus (SARS-CoV-2; COVID-19): a systematic review and meta-analysis of 148 studies from 9 countries. *PLoS One* 2020; 15(6), e0234765. DOI: 10.1371/journal.pone.0234765.
- Terpos, E., Ntanasis-Stathopoulos, I., Elalamy, I., Kastritis, E., Sergentanis, T. N., Politou M, Psaltopoulou, T., Gerotziafas, G. and Dimopoulos, M. A.: Hematological findings, and complications of COVID-19. *American Journal of Hematology* 2020;95:834–847. doi: 10.1002/ajh.25829.
- Courtet, P., Olié, E., Debien, C. and Vaiva, G.: Keep Socially (but Not Physically) Connected and Carry on: Preventing Suicide in the Age of COVID-19. *J. Clin Psychiatry* 2020;81(3),20 com13370. <https://doi.org/10.4088/JCP.20com13370>.
- Singh, J. and Singh, J.: COVID-19 and its impact on society. *Electronic Res J Soc Sci Humanit* 2020;2(1):168 – 172.
- WHO Coronavirus disease (COVID-19). Available <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>, 2022b. (29.11.2022).
- Belfroid, E., van Steenberg, J., Timen, A., Ellerbroek, P., Huis A. and Hulscher, M.: Preparedness and the importance of meeting the needs of healthcare workers: a qualitative study on Ebola. *J Hospital Infection* 2018;98:212–218. doi: 10.1016/j.jhin.2017.07.001.
- Lai J, Ma S, Wang Y, Cai, Z., Hu, J., Wei, N., Wu, J., Du, H., Chen, T., Li, R. et al.: Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. *JAMA Network Open* 2020; 3(3):e203976. doi:10.1001/jamanetworkopen.2020.3976.
- Pappa, S., Ntella, V., Giannakas, T., Giannakoulis, V.G., Papoutsis, E. and Katsaounou, P.: Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. *Brain, Behavior, and Immunity* 2020;88:901-907, doi: 10.1016/j.bbi.2020.05.026.
- Temsah, M. H., Al-Sohime, F., Alamro, N., Al-Eyadhy, A., Al-Hasan, K., Jamal, A., Al-Maglouh, I., Aljamaan, F., Al Amri, M., Barry, M., Al-Subaie, S. and Somily, A. M.: The psychological impact of COVID-19 pandemic on health care workers in a MERS-CoV endemic country. *J Infection and Public Health* 2020;13(6):877–882. <https://doi.org/10.1016/j.jiph.2020.05.021>.
- Chen, J., Wang, C. and Tang, Y.: Knowledge Mapping of Volunteer Motivation: A Bibliometric Analysis and Cross-Cultural Comparative Study. *Frontiers in Psychology* 2022; 13:883150. doi: 10.3389/fpsyg.2022.883150.

18. *Taywade, M., Chandanshive, P. D. and Pradhan, S. K.:* COVID-19 pandemic and role of behavior change communication. *Current Medical Research* 2021;19:185-187. DOI: 10.4103/cmi.cmi_5_21.
19. *Michie, S. and West, R.:* Sustained behavior change is key to preventing and tackling future pandemics. *Nature Medicine* 2021;27:749–752. <https://doi.org/10.1038/s41591-021-01345-2>.
20. *Bonell, C., Michie, S., Reicher, S., West, R., Bear, L., Yardley, L., Curtis, V., Amlôt, R. and Rubin, G. J.:* Harnessing behavioural science in public health campaigns to maintain “social distancing” in response to the COVID-19 pandemic: Key principles. *J Epidemiol Community Health* 2020;74(8):617-619, doi: 10.1136/JECH-2020-214290.
21. *Skivington, K., Matthews, L., Simpson, S.A., Craig, P., Baird, J., Blazeby, J.M., Boyd, K.A., Craig, N., French, D. P., McIntosh, E., Petticrew, M., Rycroft-Malone, J., White, M. and Moore L.:* A new framework for developing and evaluating complex interventions: Update of Medical Research Council guidance. *BMJ* 2021; 374: 2061. 10.1136/bmj.n2061.
22. *West, R., Michie, S., Rubin, G. J., & Amlôt, R.:* Applying principles of behavior change to reduce SARS-CoV-2 transmission. *Nature Human Behavior* 2020;4(5):451-459.
23. *Miller, G. J., Hartman, T. K., Levita, L., Martinez, A. P., Mason, L., McBride, O., McKay, R., Murphy, J., Shevlin, M. and Stocks, T. V.:* Capability, opportunity, and motivation to enact hygienic practices in the early stages of the COVID-19 outbreak in the United Kingdom. *British J Health Psychol* 2020;25(4):856-864.
24. *Tejativaddhana, P., Suriyawongpaisal, W., Kasemsup, V. and Suksaroj, T.:* The Roles of Village Health Volunteers: COVID-19 Prevention and Control in Thailand. *Asia Pacific Journal of Health Management* 2020;15(3):18-22. <https://doi.org/10.24083/apjhm.v15i3.477>.
25. *Kang H.:* Sample size determination and power analysis using the G*Power software. *Journal of educational evaluation for health professions* 2021;18:17. <https://doi.org/10.3352/jeehp.2021.18.17>.
26. *Harvey, K. and Horton L.:* Bloom's human characteristics and school learning. *Phi Delta Kappan International* 1977;59: EJ167839.
27. *Khasne, R. W., Dhakulkar, B. S., Mahajan, H. C. and Kulkarni, A. P.:* Burnout among healthcare workers during COVID-19 pandemic in India: results of a questionnaire-based survey. *Indian J Critical Care Medicine* 2020;24:664. doi: 10.5005/jp-journals-10071-23518.
28. *Omoronyia, O., Ekpenyong, N., Ukweh, I. and Mpama, E.:* Knowledge and practice of COVID-19 prevention among community health workers in rural Cross River State, Nigeria: implications for disease control in Africa. *Pan African Medical Journal* 2020;37(50): 1-12.
29. *Anyanti, J., Nwala, A., Onyezobi, C. E., Udoh, E. E., Ahmadu, H. and Sango, R.:* Knowledge and perception of community health volunteers of family planning services towards COVID-19 Disease. *International Journal of Sexual and Reproductive Health Care* 2020;3(1):075-079. DOI: <https://dx.doi.org/10.17352/ijsrhc.000017>.
30. *Gazzinelli, M. F., Souza, V., Lobato, L. and Nathale A.:* Teatro na educação de crianças e adolescentes. *Rev Saude Publica*, 2012;46(6):999–1006. doi: 10.1590/S0034-89102012000600009.
31. *Ma, X.:* Gender Gap in Volunteer Activity Participation. In: *Female Employment and Gender Gaps in China*. Hitotsubashi University IER Economic Research Series, 47. Springer, Singapore, 2021. <https://doi.org/10.1007/978-981-33-6904-7-6>.
32. *Michie, S., van Stralen, M. M. and West, R.:* The Behaviour Change Wheel: a new method for characterizing and designing behaviour change interventions. *Implementation Science* 2011;6:42.
33. *BSDPT - Behavioural Science and Disease Prevention Taskforce.:* Behavioural science and disease prevention: Psychological guidance. London, UK: BPS Behavioural Science and Disease Prevention Taskforce. 2020. Available <https://www.bps.org.uk/guideline/behavioural-science-and-disease-prevention-psychological-guidance> (4.12.2022).
34. *Jung, Y. M. and Kim, N. Y.:* Factors Affecting Preventive Health Behaviors against COVID-19 in Nursing Students: A Cross-Sectional Study. *International Journal of Environmental Research and Public Health* 2022;19(9):5496. <https://doi.org/10.3390/ijerph19095496>.
35. *Kaweenuttayanon, N., Pattanarattanamolee, R., Sorncha, N., Nakahara, S.:* Community surveillance of COVID-19 by village health volunteers, Thailand. *Bulletin of the World Health Organization* 2021;99(5):393–397. <https://doi.org/10.2471/BLT.20.274308>.
36. *Wakida E. K., Obua, C., Rukundo, G. Z., Maling, S., Talib, Z. M. and Okello, E. S.:* Barriers and facilitators to the integration of mental health services into primary healthcare: a qualitative study among Ugandan primary care providers using the COM-B framework. *BMC Health Services Research* 2018;18(890):1-12.
37. *Afari-Asiedu, S., Asante, K. P., Senah, K., Abdulai, M. A., Afranie, S., Mahama, E., Anane, E. A., Abukari, M., Darko, M. L., Febir, L. G. and Owusu-Agyei, S.:* Volunteering for Health Services in the Middle Part of Ghana: In Whose Interest? *International journal of health policy and management* 2018;7(9):836–846. <https://doi.org/10.15171/ijhpm.2018.38>.
38. *Kaseje, D. C., Spencer, H. C. and Sempebwa, E. K.:* Characteristics and functions of community health workers in Saradidi, Kenya. *Annals Tropical Medicine Parasit* 1987;81Suppl.1:56–66.
39. *Lydon, S., Grealley, C., Tujjar, O., Reddy, K., Lambe, K., Madden, C., Walsh, C., Fox, S. and O'Connor, P.:* Psychometric evaluation of a measure of factors influencing hand hygiene behaviour to inform intervention. *J Hospital Infection* 2019;102(4):407–412. doi: 10.1016/j.jhin.2019.02.003.
40. *Timlin, D., McCormack, J. M. and Simpson, E. E.:* Using the COM-B model to identify barriers and

facilitators towards adoption of a diet associated with cognitive function (MIND diet). *Public Health Nutrition* 2021;24(7):1657–1670. <https://doi.org/10.1017/S1368980020001445>.

Current Directions in Psychological Science, 1999;8(5):156–159. doi: 10.1111/1467-8721.00037.

41. *Clary, E. G. and Snyder, M.*: The motivations to volunteer: theoretical and practical considerations.

Received: 22.12.2022

Accepted: 25.01.2023