ปัจจัยที่มีอิทธิพลต่อพฤติกรรมการดำเนินงานควบคุมโรคติดเชื้อไวรัสโคโรนา 2019 ในชุมชนของอาสาสมัครสาธารณสุขประจำหมู่บ้าน
Factors Influencing COVID-19 Control Behaviors in the Community among Village Health Volunteers

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บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาพฤติกรรมการดำเนินงานควบคุมโรคติดเชื้อไวรัสโคโรนา 2019 หรือโควิด-19 และปัจจัยที่มีอิทธิพลต่อพฤติกรรมดังกล่าวของอาสาสมัครสาธารณสุขประจำหมู่บ้าน **วิธีการศึกษา:** การศึกษาหาความสัมพันธ์เชิงทำนายมีกลุ่มตัวอย่างเป็นอาสาสมัครสาธารณสุขประจำหมู่บ้านในจังหวัดชลบุรี โดยการสุ่มอย่างง่ายจำนวน 150 คน รวบรวมข้อมูลโดยใช้แบบสอบถามข้อมูลทางประชากรศาสตร์ ความรู้เกี่ยวกับโรคและการดำเนินงานควบคุมโรค การรับรู้ความรุนแรงต่อโรค การรับรู้โอกาสเสี่ยงจากการดำเนินงาน ทัศนคติต่อโรคและการดำเนินงาน การรับรู้นโยบายการดำเนินงาน การได้รับแรงจูงใจในการดำเนินงาน การได้รับสนับสนุนวัสดุอุปกรณ์ในการดำเนินงาน และพฤติกรรมการดำเนินงาน วิเคราะห์ข้อมูลด้วยสถิติพรรณนา และสถิติสมการถดถอยพหุคูณแบบขั้นตอน **ผลการศึกษา:** กลุ่มตัวอย่างมีพฤติกรรมการดำเนินงานควบคุมโรคติดเชื้อโควิด-19 ในชุมชนโดยรวมในระดับสูงมาก (mean = 4.34 ± 0.75 จากคะแนนเต็ม 5) ปัจจัยที่สามารถร่วมทำนายพฤติกรรมการดำเนินงานควบคุมโรคมี 4 ปัจจัย ซึ่งปัจจัยนำ ได้แก่ ความรู้เกี่ยวกับโรคและการดำเนินงาน (β = 0.578) และการรับรู้โอกาสเสี่ยงจากการดำเนินงาน (β = 0.179) ปัจจัยเสริม ได้แก่ การได้รับสนับสนุนวัสดุอุปกรณ์ (β = 0.183) ปัจจัยเอื้อ ได้แก่ การรับรู้นโยบายควบคุมโรค (β = 0.148) โดยสามารถร่วมกันอธิบายความแปรปรวนของพฤติกรรมฯ ได้ร้อยละ 74.2 (R[2] = 0.742, P-value < 0.001) **สรุป:** พฤติกรรมการดำเนินงานควบคุมโรคโควิด-19 ในชุมชนของอาสาสมัครสาธารณสุขประจำหมู่บ้านอยู่ในระดับสูงมาก ความรู้เกี่ยวกับโรคและการดำเนินงานควบคุมโรค การรับรู้โอกาสเสี่ยงจากการดำเนินงานควบคุมโรค การสนับสนุนวัสดุอุปกรณ์ การรับรู้นโยบายการควบคุมโรคสามารถร่วมทำนายพฤติกรรมได้อย่างมีนัยสำคัญ

คำสำคัญ: ปัจจัย, การควบคุมโรคติดเชื้อไวรัสโคโรนา 2019, โควิด-19, อาสาสมัครสาธารณสุขประจำหมู่บ้าน

Abstract

Objective: To determine Covid-19 control behavior and identify factors influencing the behavior among village health volunteers. **Methods**: In this predictive correlational research, the sample was 150 village health volunteers in Chonburi province recruited using the simple random sampling technique. Questionnaires were used to gather data for demographic information, knowledge, perceived severity, perceived susceptibility, attitude, perceived policy, motivation and materials/devices support, and Covid-19 control behavior. Descriptive statistics and stepwise multiple regression analysis were used to analyze data. **Results:** The overall Covid-19 control behavior was at a very high level (mean = 4.34 ± 0.75 out of 5 points). The predisposing factors, i.e., knowledge (β = 0.578) and perceived risk of infection while working (β = 0.179), reinforcing factor, i.e., supports for materials and devices (β = 0.183) and enabling factor, i.e., perceived policy (β = 0.148) were able to predict the behavior with 74.2% variance explained (R[2] = 0.742, P-value < 0.001). **Conclusion:** The Covid-19 control behavior in the community among village health volunteers was at a very high level. Knowledge, perceived susceptibility for infection, support of materials and devices, and perceived policy significantly predicted the behavior.

Keywords: factors, coronavirus 2019, Covid-19, control behavior, village health volunteers

Introduction

The pandemic of coronavirus 2019 or Covid-19 is a global health crisis as issued by the World Health Organization (WHO) on January 30, 2020.[1] On January 27, 2022, 360,166,711 cumulative infected cases have been recorded resulting in an infection rate of 46,662 per 1,000,000 populations and death rate of 724.5 per 1,000,000 populations or 1.93%.[2] Thailand was the first country with Covid-19 infection outside China, the origin of the outbreak. With the continuous spreading of Covid-19 in Thailand, the Ministry of Public Health issued Covid-19 a deadliest infectious disease.[3] On January 27, 2022, there were 2,407,022 cumulative infected cases with a rate of infection of 34,349 per 1,000,000 populations, and death of 315 per 1,000,000 populations or 0.93%.[2] With a severe and widespread infection, vigilance in

28 provinces was elevated to the red zone.[4] Chonburi was one of the 28 red-zone provinces. On January 3, 2021, infected individuals in Chonburi comprised 43.2% of the nationwide new cases. On January 27, 2022, there were 15,617 cumulative cases, with 2.1% new cases and death rate of 0.12%.[5]

Covid-19 primarily damages lung resulting in severe pneumonia, and ultimately acute respiratory failure (19.6%) and difficulty breathing (16.7%). The disease also causes inflammation throughout the body resulting in internal organs damage or failure especially in high-risk individuals such as the elderly, obese persons[6], and those with underlying diseases such as hypertension, diabetes, heart disease, chronic obstructive pulmonary disease, cancer and kidney disease.[7] The aggressive spreading prompted the government to issue urgent monitoring at sub-district level to proactively screening for new cases.[8] The task or practice for healthcare workers in disease control on Covid-19 consisted of preparations, self-protection in disease control, and door-to-door screening and control.

Village health volunteers are individuals responsible for community health by promoting lifestyle modification and desirable health behavior in the community.[9] Village health volunteers are also crucial in community disease control. With a long-lasting pandemic, village health volunteers were working hard. Therefore, the volunteers could be stressed, exhausted, and burnt out.[10] This reflected problems village health volunteers in community disease control. Chonburi is an economic area with diverse ethnicities, areas conveniently commuted, and population-dense areas especially entertainment areas, traveling areas, restaurants, markets, and open markets. As a result, Chonburi was issued with the red-zone province with a highly contagious disease. As proactive disease control workers, village health volunteers worked alongside local healthcare providers in each community. The level of practice or behavior of village health volunteers in controlling the disease and factors affecting such behavior could determine the success of their disease control.

In this present study, PRECEDE - PROCEED Model of Green and Kreuter[11] was used to determine the behavior of village health volunteers in controlling Covid-19. The model explains various factors both internal and external ones that affect the target health behaviors.[11] These factors could be used for promoting the health behavior modifications. In this study, step 1 of the model which is diagnosis (PRECEDE) and

step 3 which is evaluation on education and environment were incorporated in the study conceptual framework. These steps provide predisposing factors which generate motivation or causes for behavioral changes. These predisposing factors are intrapersonal ones which include knowledge about the disease and its control[12-16], and the perception on disease severity[17,18], for example, severe pulmonary infection caused by Covid-19 and aggravated by underlying diseases, and perceived risk of the task of controlling the disease, for example, the risk increased with no mask, face shield, or suit, and poor disposal of PPE.[12,19] The perception on the risk of infection while delivering the task of disease control and screening is essential since it could guide the person to behavior appropriately. The perception on risk while controlling and screening disease in intrapersonal factor explaining that the person has the risk of getting the disease and the disease is hazardous to the health. Such perception drives the certain behavior and further strengthen attitude toward the disease and its control.[13,14,20-22] The attitude toward the disease and its control is also a predisposing factor which could be positive and negative toward the person's behavior. Enabling factors are resources that could help the person to perform the behavior, for example, the perception on policy of disease control.[20,23] Reinforcing factors are rewards or persuasive matters the person receives or expects to receive from others when the behavior is performed. Reinforcing factors help strengthen the behavior. These factors include motivation to perform disease conrol[17,22-27] and support of materials and devices for disease control.[28,29] Predisposing, enabling and reinforcing factors together promote the behavior of disease control among village health volunteers.

This present study aimed to determine village health volunteers' health behavior of Covid-19 disease control and predictive power of its predisposing factors (knowledge about Covid-19 and disease control, perceived disease severity, perceived risk of infection while controlling the disease, and attitude toward Covid-19 and its disease control), enabling factors (perception on disease control policy) and reinforcing factors (motivation and material supports for disease control). These study variables were based on the concept of PRECEDE-PROCEED mode.[11] The finding could be useful in promoting health behaviors necessary for disease control task for Covid-19 among village health volunteers.

Specifically, we tested the associations between Covid-19 control behavior and knowledge of the volunteers about

Covid-19 and control of the disease, perceived severity of Covid-19, perceived risk of performing disease control, attitude toward Covid-19 and the disease control, perceived policy on Covid-19 disease control, motivation and support to perform the task, and material and device support for Covid-19 control.

Methods

In this predictive, correlational study, study population was village health volunteers regardless of gender, in Chonburi province. Study sample was those in study population who met the inclusion criteria. To be eligible, they had to be 20 – 60 years old, be volunteering in Chonburi for at least one year, have training for the volunteers, and be willing to participate in the study.

The sample size was estimated based on power analysis using the G* Power software. The effect size of 0.17 was from a previous study.[18] With a type I error of 5% (or P-value < 0.05), power of test of 0.95, and 7 independent variables, a sample size of 136 participants was required. To compensate for incomplete questionnaires, a 10% compensation[30] resulted in 150 participants required. Participants were sampled with multistage sampling method. Of the 11 districts in Chonburi province, three districts with the highest number of Covid-19 infected cases were purposively selected. In each selected district, 50% of sub-districts were selected using simple random sampling. The number of participants from each sub-district was proportional to the size of village health volunteers among sub-districts. Selected village health volunteers were checked for eligibility. The sampling was done without replacement.

Research instruments

The questionnaire was examined for content validity by three experts specifically one infectious disease specialist, one nurse specialized in infectious diseases, and one member of a Faculty of Nursing. The questionnaire was found to have acceptable content validity with an index of 1.0 for all parts. For internal consistency reliability, 30 individuals with characteristics comparable with the participants were asked to complete the questionnaire. The internal consistency reliability of each relevant part was as follows.

The first part contained 7 questions asking participant's demographic characteristics including gender, age, marital status, education level, occupation, monthly income, and duration of volunteering. The questions were developed by the researchers.

The second part assessed the knowledge of the volunteers about Covid-19 and control of the disease from their learning and experience included meaning, signs and symptoms, harms, and ways to control Covid-19. The 12 questions were developed by the researchers based on literature and modified from those asking about knowledge on Covid-19 from a previous work.[16] With multiple choice questions with one correct choice, 1 point was given for a correct answer and 0 for incorrect ones. The total scores ranged from 0 to 12 points where higher scores indicated more knowledge. Internal consistency reliability was borderline acceptable with a Kuder-Richardson 20 coefficient of 0.62.

The third part was questions about perceived severity of Covid-19 which is referred to the belief that being infected with Covid-19 could be highly harmful to the volunteer's health and life. For example, Covid-19 causes severe lung infection and underlying illnesses could aggravate the infection to the life-threatening disease. The questions were modified from a previous work on perceived severity on Covid-19 infection.[31] The response was a 5-point rating scale ranging from 1-the least, to 2-less, 3-moderate, 4-more, and the 5-the most. With a total of 6 questions, the possible total scores ranged from 6 – 30 points where higher scores indicated higher perceived severity. The questions had high reliability with a Cronbach's alpha coefficient of 0.86.

The fourth part assessed perceived risk of performing disease control which was defined as beliefs or expectations of the volunteers about probability to get sick or infected with Covid19 from their work of disease control. The tasks that could pose the risk included not wearing face mask and face shield, and incorrect wearing and disposing PPE, screening signs and symptoms for Covid-19 infection. The questions were developed from literature and modified from a previous study about the perceived risk of Covid-19 infection from occupational tasks.[18] The response was a 5-point rating scale of how much the risk of infection was perceived ranging from 1-the least risk, to 2-less risk, 3-moderate risk, 4- more risk, and 5-the most risk. With the total of 7 questions, the possible total scores ranged from 7 – 35 points, where higher scores indicated higher perceived risk. The questions had acceptable reliability with a Cronbach's alpha coefficient of 0.75.

Part five assessed the attitude toward Covid-19 and the disease control which was defined as how the volunteer felt

positively and negatively about the disease and how to control the disease. For example, attitude toward the restricted face masking every time leaving the house could control the spreading and the attitude of willingness and pride in performing disease control in the community despite facing the risk of harmful disease. The questions were developed from literature, and some were modified from a previous study about the attitude toward Covid-19 and the disease control.[19] The response was a 5-point rating scale ranging from 1- least agree to 2-less agree, 3-moderately agree, 4-more agree, and 5- most agree. Scores of negative questions were reversed before summarizing. With the total of 9 questions, the possible total scores ranged from 9 – 45 points, where higher scores indicated a higher positive attitude toward Covid-19 and the disease control. The questions had acceptable reliability with a Cronbach's alpha coefficient of 0.72.

Sixth part assessed perceived policy on Covid-19 disease control which was defined as how the volunteer viewed the policy's process and measures to control the disease from responsible offices, for example, perception on plan and task in controlling Covid-19 spreading, and the number of households for a volunteer to monitor. The questions were developed from literature and were modified from a previous work on perceived policy on the control of infectious diseases.[21] Response was a 5-point rating scale ranging from 1-least agree to 2-less agree, 3-moderately agree, 4-more agree, and 5- most agree. With the total of 8 questions, the possible total scores were 8 – 40 points where higher scores indicated that the policy was more perceived. The questions had high reliability with a Cronbach's alpha coefficient of 0.83.

Seventh part evaluated how much the volunteer was motivated and supported to perform the task. Such motivation could be acceptance and respect from others, financial reward, and success in controlling the disease itself such as the lower number of infected cases and deaths in the community. WHO praised the work of village health volunteers of Thailand is one the well-known rewards for the volunteers. The questions were developed from literature and modified from a previous work on the success in controlling Covid-19 among village health volunteers.[31] Response was a 5-point rating scale ranging from 1- least agree, to 2-less agree, 3-moderately agree, 4-more agree, and 5- most agree. With the total of 6 questions, the possible total scores were 6 – 30 points where higher scores indicated that the volunteer was

more motivated in controlling the disease. The questions had high reliability with a Cronbach's alpha coefficient of 0.81.

Part eight evaluated how much the material and device support for Covid-19 control the volunteer received including quality face mask, face shield, thermometer, and hand-washing alcohol, and fast and appropriate procedural support. The questions were developed based on literature and modified from a previous work of the success of Covid-19 control by village health volunteer.[31] Response was a 5-point rating scale ranging from 1-least agree, to 2-less agree, 3-moderately agree, 4-more agree, and 5- most agree. With the total of 6 questions, the possible total scores were 6 – 30 points where higher scores indicated more supports perceived. The questions had high reliability with a Cronbach's alpha coefficient of 0.83.

Ninth part assessed the control of Covid-19 behavior which was the reported practice of the volunteer as directed by the measures of the Ministry of Public Health. The questions were developed based on the guideline for prevention and control of Covid-19 by the Department of Disease Control.[8] Questions involved 3 steps of Covid-19 control. For the first step, there were four preparations including self-inspecting on health and preparing materials and devices before the control task. The second step provided measures for self-protection that volunteers had to comply with, such as proper handling of devices while working. The third step issued the door-to-door approach control of Covid-19 such as monitoring the house-bound person every day for 14 days. The volunteers were asked how often they practice each behavior. There were both positive and negative statements. Response was a 5-point rating scale ranging from 1-never, to 2-rarely, 3-sometimes, 4-usually, and 5-always. Scores of negative statements were reversed. With the total of 25 questions, the possible total scores were 25 – 125 points, where higher scores indicated more practice of positive behavior. Behavior level was categorized based on the total score of 1 - 5 points as lowest, low, moderate, high and highest (1.00 – 1.49, 1.50 – 2.49, 2.50 – 3.49, 3.50 – 4.49, and 4.50 – 5.00 points, respectively).[32] The questions had very high reliability with a Cronbach's alpha coefficient of 0.95.

Ethical considerations for participant protection

The study protocol was approved by the Ethics Committee for Human Study of Burapha University (approval number: G-HS053/ 2564; approval date: May 27, 2021). Participants were

informed about the objective, data collection procedure, and voluntary nature of the study. Written informed consent was obtained and participants could stop participating at any time without consequences. All data were secured, and no identity of the participants could be determined. Results were presented as a summary not individual participant's data.

Data collection procedure

At each of the three selected districts, the researcher approached healthcare providers supervising the work of village health volunteers and the head of the volunteers in-person to ask for permission to conduct research. For any areas of sub-districts where in-person contract was not possible, online survey through Line[TM] was used. The questionnaire took about 45 – 60 minutes to complete.

Data analysis

Descriptive statistics including frequency with percentage and mean with standard deviation (SD) were used to summarize demographic characteristics of the participants and all study variables. Associations between Covid-19 control behavior and various factors (i.e., knowledge of the volunteers about Covid-19 and control of the disease, perceived severity of Covid-19, perceived risk of performing disease control, attitude toward Covid-19 and the disease control, perceived policy on Covid-19 disease control, motivation and support to perform the task, and material and device support for Covid-19 control) were tested using stepwise multiple linear regression analysis. All assumptions for stepwise multiple linear regression analysis were met. Statistical significance was set at a type I error of 5%. All statistical analyses were performed using the software program SPSS version 20.0.

Results

Of the 150 participants, most were women (84.7%), 56 – 60 years old (45.3%) (mean of 52.33 ± 7.39 years), married (64.7%), with primary education (36.0%), with a monthly income of 5,001 – 10,000 Baht (36.0%) (mean of $10,612 \pm 8,889.8$ Baht)), with small business (39.3%) followed by labor (30.7%), and working as village health volunteer for less than 10 years (57.3%) followed by 10 – 20 years (28.7%) (mean of 11.83 ± 8.53 years).

The behavior of Covid-19 control was at the highest level with a mean of 4.34 ± 0.75 out of 5 points (Table 1). For the first step of control which was preparation, the two behaviors with the highest scores were self-inspecting on one's health before performing the task in the community (mean = 4.69 points) and preparing materials and devices for door-to-door approach (mean = 4.54 points). For the second step of self-protection in proactive disease control, wearing all necessary devices all the time was at a high level (mean = 4.49 points). For the third step of door-to-door operation, the highest two behaviors were the strict face masking of people in the community (mean = 4.55 points) and the strict social distancing of people in the community (mean = 4.53 points) (Table 1).

Table 1 Scores and levels of Covid-19 control behavior (N = 150).

Covid-19 Control Behavior	M	SD	Level
Preparations			
1. self-inspecting on one's health before performing the task in the community	4.69	0.58	Highest
2. preparing materials and devices for door-to-door approach	4.54	0.62	Highest
3. monitoring individuals with infection in the community	4.35	0.82	High
4. coordinating with the community and households	4.35	0.83	High
Self-protection in proactive disease control			
5. wearing all necessary devices all the time	4.49	0.70	High
Door-to-door operation			
6. strict face masking of people in the community	4.55	0.61	Highest
7. strict social distancing of people in the community	4.53	0.60	Highest
8. recommending public how to observe abnormal signs	4.49	0.60	High
9. educating people about self-protection	4.49	0.62	High
10. educating people how to monitor abnormal circumstance	4.43	0.74	High
11. notifying healthcare providers for people with fever and cough	4.41	0.69	High
12. notifying healthcare providers for people returning from a red zone	4.33	0.81	High
13. notifying healthcare providers for a group of people with fever and cough	4.32	0.71	High
14. monitoring and advising the elderly how to prevent Covid-19	4.31	0.69	High
15. informing people to avoid high-risk area	4.31	0.75	High
16. cleaning the place of infected person	4.31	0.77	High
17. restricting people on entering and leaving the area	4.30	0.73	High
18. notifying healthcare providers if high-risk people have fever	4.29	0.82	High
19. monitoring quarantined person symptoms every day for 14 days	4.28	0.74	High
20. screening people for fever, cough, sore throat, and difficulty breathing	4.26	0.81	High
21. documenting follow-up of people in the community and passing to responsible officers	4.21	0.81	High
22. collecting information of people entering and leaving the responsible risk area	4.15	0.87	High
23. monitoring fever and cough of people in responsible area	4.10	0.78	High
24. recording the report with label to mark the household	3.96	0.88	High
25. reporting door-to-door visit through online channel	3.94	1.05	High
Overall	**4.34**	**0.75**	**High**

Of the seven study factors, there were four factors significantly predicting Covid-19 control behavior including (1) knowledge about Covid-19 and Covid-19 control which is a predisposing factor ($R^2 = 0.620$, P-value < 0.001, $\beta = 0.578$), (2) perceived risk of Covid-19 control which is a predisposing

factor (R^2 = 0.693, P-value < 0.001, β = 0.179), (3) supports of materials and devices for disease which is a reinforcing factor (R^2 = 0.726, P-value < 0.001, β = 0.183), and (4) perceived policy for disease control which is an enabling factor (R^2 = 0.742, P-value < 0.001, β = 0.148). There four factors simultaneously explained 74.2% of variance of Covid-19 control behavior (R^2 = 0.742, P-value < 0.001) (Table 2).

Table 2 Associations between Covid-19 control behavior and selected factors (N = 150).*

Factors	R^2	b	SE(b)	Beta	t	P-value
1. knowledge about Covid-19 and Covid-19 control	0.620	4.914	0.420	0.578	11.699	< 0.001
2. perceived risk of Covid-19 control	0.693	0.489	0.142	0.179	3.439	< 0.001
3. supports of materials and devices for disease control	0.726	0.501	0.139	0.183	3.602	< 0.001
4. perceived policy for disease control	0.742	0.478	0.162	0.148	2.953	0.004
constant		18.592	5.197		3.577	< 0.001
R^2 = 0.742, $F_{(4, 145)}$ = 104.14, P-value < 0.001						

* Multiple linear regression analysis.

Discussions and Conclusion

The Covid-19 control behavior among village health volunteers in Chonburi province was at the highest level with a mean of 4.34 ± 0.75 out of 5 points. These volunteers were in their highly mature adulthood with 45.3% of them in their 56 – 60 years of age old (45.3%) (mean of 52.33 ± 7.39 years) and with 57.3% having volunteering than 10 years and 28.7% volunteering 10 – 20 years (mean of 11.83 ± 8.53 years). Based on the eligibility criteria, all volunteers attended the training on disease control. These volunteers could be considered individuals with good knowledge about the risk of spreading, clear perception on the policy and process, having motivation and supports on materials and devices and supports from healthcare providers such as community nurses, municipality, and sub-district health promoting hospital.

Our finding is consistent with a previous similar study on village health volunteers in a district in Nan province revealing that the volunteers had a high level of Covid-19 prevention control behavior (mean = 2.75 ± 0.194 out of 3 points).[33] Another previous study in a district of Supanburi province also showed that village health volunteers had a high level of Covid-19 prevention control behavior (mean = 4.39 ± 0.573 out of 5 points).[34]

For factors predicting Covid-19 control behavior, the first significant one was knowledge about Covid-19 and disease control which is a predisposing factor. It could explain 62% of variance of the behavior (R^2 = 0.620, P-value < 0.001) with the highest positive influence on the behavior (β = 0.578). This could be attributable to the volunteer's good knowledge and volunteer experience of more than 10 years. They were skilled in their task with the training in monitoring and controlling Covid-19. The factor was thus the most influencing one on the behavior to be at the highest level. A study on a district of Nan province also revealed the volunteers had a high level of knowledge (mean = 16.56 ± 2.204 out of 20 points) and high level of performing their roles (mean = 2.75 ± 1.194 out of 3 points).[33] The knowledge of volunteers in Nan province could explain 117% of variance of the role performance (R^2 = 0.117, P-value < 0.001, β = 306).

Perceived risk of infection while performing the disease control task as another predisposing factor was able to significantly explain another 7.3% of variance of Covid-19 control behavior (R^2change = 0.073) to achieve 69.3% (R^2 = 0.693, P-value < 0.001). The extent of the influence of this factor on the behavior was ranked third (β = 0.179). These volunteers perceived the risk of getting infected while working. They paid attention to proper practice such as face masking, hand washing, social distancing, and wearing PPE. As a result, this predisposing factor could influence the behavior to achieve the highest level. A study in volunteers in Sukhothai province also found the perceived risk of Covid-19 infection while working was at the highest level (mean = 4.62 ± 0.86 out of 5 points) and was positively associated with Covid-19 control behavior (r = 0.521, P-value < 0.001).[35]

Motivation and material supports for disease control as a reinforcing factor was able to explain additional 3.3% of variance of the behavior (R^2 change = 0.033) to achieve 72.6% (R^2 = 0.726, P-value < 0.001). The factor has the second most positive influence on the behavior (β = 0.183). These volunteers were fully supported with advice and encouragement from healthcare providers and necessary materials and devices including face mask, PPE, glove, face shield and thermometer. The Covid-19 control behavior could thus be at the highest level. A previous study also showed that village health volunteers received support from family members, community, and healthcare providers and devices needed which allowed them to perform well in monitoring Covid-19 in their community (β = 0.360, P-value < 0.001).[36]

Another study revealed that enabling factor which was resource sufficiency (β = .159, P-value < 0.001) and reinforcing factor which was information and advice from healthcare providers (β = 0.780 P-value < 0.016) had positive influence on monitoring dengue among village health volunteers in Chiangmai province with a 28.4% variance of the behavior explained.[23]

Perception on disease control policy as an enabling factor was able explain additional 1.6% of variance of the behavior (R^2 change = 0.016) to achieve the ultimate 74.2% (R^2 = 0.742, P-value < 0.01). It was found to be the fourth positively influencing the behavior (β = 0.148). These volunteers had been provided with policy and measures for Covid-19 control from healthcare providers and community nurses continuously. Such policy and measures had been regularly carried out. For example, door-to-door monitoring to screen for signs and symptoms and monitor those infected. Clear policy and measures allowed and enhanced the behavior. A previous study showed that perceived policy on controlling infectious diseases on the border could influence participation of village health volunteers in Payao province with statistical significance (r = 0.012, P-value < 0.05).[21]

In conclusion, knowledge about Covid-19 and disease control and perceived risk of infection while performing the disease control task as predisposing factors, motivation and material supports for disease control as a reinforcing factor, and perception on disease control policy as an enabling factor were significantly, positively influenced Covid-19 control behavior. This association could be useful in developing an even more effective program to promote Covid-19 control practice among village health volunteers.

This study has certain limitations. The mode of questionnaire administration and completion was different, some volunteers were administered in-person while some were done online. However, no distinct difference in answers from the two methods was found. The study selected three districts with the highest incidence of infection, representativeness for all village health volunteers in Chonburi province was relatively limited. Areas with less severe infection could not be fully represented. In addition, volunteers with less proactive task could show different levels of behavior and factors.

The findings could be useful in practice. Community nurses and healthcare providers could develop program to promote participations of village health volunteers in Covid-19 control by providing knowledge and advice, encourage the perception on risk of performing the task, support materials and devices for full availability and easy use, communicate clear policy and measures on Covid-19 control. The potential of village health volunteers could then be strengthened.

For future research, programs to promote perception on risk and policy and knowledge about Covid-19 control for village health volunteers should be developed and tested. These programs should focus more on new diseases. More information and communication technology in these programs should be tested.

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