Araştırma Makalesi/Original Article
Makale Dili "İngilizce"/Article Language "English"

Türk Hijyen ve Deneysel Biyoloji Dergisi

Health promotion model of COVID-19 prevention and control behavior: A mixed methods study

COVID-19 önleme ve kontrol davranışının sağlığı geliştirme modeli: Karma yöntem çalışması

Widana PRIMANINGTYAS[1] (ID), Endang SUTISNA SULAEMAN[2] (ID), Heni HASTUTI[3] (ID), Anak Agung Alit Kirti Estuti Narendra PUTRİ[3] (ID), Abdul RAHMAN[4] (ID), Slamet RIYADI[5] (ID)

ABSTRACT

Objective: Lack of health promotion to eradicate coronavirus disease 2019 (COVID-19) remains a major issue in 2021. COVID-19 cases in Indonesia are the highest in Southeast Asia. Effective promotion models for prevention and control of COVID-19 (PCCOVID-19) in all areas are needed. This study aims to examine the selected health promotion models for preventing COVID-19 escalation.

Methods: This study used a mixed methods approach, including a survey to collect quantitative data and focus group discussions (FGDs) to elaborate on qualitative data. The study was conducted between July and September 2021, which included 166 respondents living in Boyolali-Central Java, Indonesia. Several questions used in the survey and FGDs were designed based on the health belief model (HBM), social cognitive theory (SCT), and social support model (SSM).

Results: Approximately 92% of the survey participants completed the online questionnaires,

ÖZET

Amaç: 2019'da ortaya çıkan yeni koronavirüs hastalığını (COVID-19) ortadan kaldırmak için geliştirilen "Sağlığın Teşviki ve Geliştirilmesi" projesindeki eksiklikler, 2021'de önemli bir sorun olmaya devam ediyor. Güneydoğu Asya'da COVID-19 vaka sayısı en yüksek olan ülke Endonezya'dır. Tüm alanlarda COVID-19'un önlenmesi ve kontrol edilmesi (PCCOVID-19) için etkili tanıtım modellerine ihtiyaç vardır. Bu çalışma, COVID-19'un tırmanmasını önlemek için seçilen "Sağlığı Geliştirme" modellerini incelemeyi amaçlamaktadır.

Yöntem: Bu çalışmada, nicel verileri toplamak üzere yapılan bir anket ve dahi nitel verileri detaylandırmak üzere yürütülen "Odak Grup Tartışmaları" (FGD'ler) dahil olmak üzere bir tür 'Karma Yöntem' yaklaşımı kullanılmıştır. Bu, Endonezya'nın Boyolali- Central Java kentinde yaşayan 166 katılımcı ile gerçekleştirilen bir çalışma olup Temmuz ve Eylül 2021 ayları arasında gerçekleştirilmiştir. Bir diğer söz konusu olan ankette ve FGD'lerde kullanılan birkaç soru, "Sağlık İnanç Modeli" (HBM), "Sosyal Bilişsel Teori" (SCT) ve "Sosyal Destek Modeli" (SSM) temel alınarak tasarlanmıştır.

[1]Sebelas Maret University, The Institute for Research and Community Service, Research Centre of Health Promotion and Community Empowerment, Surakarta, Indonesia
[2]Sebelas Maret University, Faculty of Medicine, Department of Public Health, Surakarta, Indonesia
[3]Sebelas Maret University, Faculty of Medicine, Program of Medicine, Surakarta, Indonesia
[4]Sebelas Maret University, College of Education, Department of Sociology-Anthropology Education, Surakarta, Indonesia
[5]Sebelas Maret University, Faculty of Medicine, Department of Histology, Surakarta, Indonesia

İletişim / Corresponding Author : Widana PRIMANINGTYAS
Jl. Ir. Sutami 36a, Jebres 57126 Surakarta - Indonesia
E-posta / E-mail : widanadoctor@staff.uns.ac.id

Geliş Tarihi / Received : 23.02.2022
Kabul Tarihi / Accepted : 18.08.2022

DOI ID : 10.5505/TurkHijyen.2023.53896

Primaningtyas W, Sutisna Sulaeman E, Hastuti H, Putri AAAKE, Rahman A, Riyadi S. Health promotion model of COVID-19 prevention and control behavior: A mixed methods study. Turk Hij Den Biyol Derg, 2023; 80(2): 171 - 182

while eight informants joined the FGD. The whole path analysis model described 53% of the variables that correlated with PCCOVID-19 behavior. The available FGD data indicated that HBM at the individual level is crucial for COVID-19 task force and healthcare workers for promoting a protective behavior during the pandemic. SCT can be applied to understand the intention of PCCOVID-19 behavior at an interpersonal level. At the community level, social support plays an important role in providing assurance to enhance the PCCOVID-19 behavior.

Conclusion: Applying the HBM, SCT, and SSM constructs, can optimize the PCCOVID-19 behavior. Perceived susceptibility, observational learning, outcome expectations, instrumental and emotional support were directly and significantly correlated with PCCOVID-19 behavior, whereas perceived susceptibility and barriers had an indirect significant correlation with PCCOVID-19 behavior through cues to action variables. These findings can be used by healthcare workers, especially COVID-19 task force to develop health promotion methods and interventions to enhance the PCCOVID-19 behavior.

Key Words: COVID-19, health promotion, health belief model, social cognitive theory, social support model

Bulgular: Anket örneklerinin yaklaşık %92'sini çevrim içi anketler oluştururken sekizinin ise bilgi kaynağı FGD'ye aitti. Tüm yol analizi modelleri, PCCOVID-19 davranışıyla ilişkili değişkenlerin %53'ünü tanımladı. Mevcut FGD verileri, bireysel düzeyde HBM'nin COVID-19 görev gücü ve sağlık çalışanları için pandemi sırasında koruyucu bir davranış modeli teşvik etmenin çok önemli olduğunu göstermiştir. PCCOVID-19 davranışının niyetini kişiler arası düzeyde anlamak için SCT uygulanabilir. Bu ise topluluk düzeyinde, sosyal destekli PCCOVID-19 davranışını geliştirmek için güvence sağlamada önemli bir rol oynar.

Sonuç: HBM, SCT ve SSM yapılarının uygulanması PCCOVID-19 davranışını optimize edebilir. Algılanan duyarlılık, gözlemsel öğrenme, sonuç beklentileri, araçsal ve duygusal destek, PCCOVID-19 davranışı ile doğrudan ve önemli ölçüde ilişkiliyken; algılanan duyarlılık ve engeller, eylem ipuçları değişkenleri aracılığıyla PCCOVID-19 davranışı ile dolaylı olarak anlamlı bir ilişkiye sahipti. Bu bulgular sağlık çalışanları tarafından -özellikle COVID-19 bölümünde çalışan görevliler tarafından- sağlığı geliştirme yöntemleri ve PCCOVID-19 davranışını geliştirmeye yönelik müdahaleler geliştirmek için kullanılabilir.

Anahtar Kelimeler: COVID-19, sağlığı geliştirme, sağlık inanç modeli, sosyal bilişsel teori, sosyal destek modeli

INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic is a significant and urgent threat to global health. Moreover, the second wave of the COVID-19 pandemic occurred in numerous continents and started differently; some European countries experienced the second wave from late summer or early autumn in 2020 until early January 2021, while the Asian countries experienced it around the second to third semester of 2021 (1-3). During the second wave, the spread of COVID-19 increased and expanded in numerous cities in Indonesia, with the number of cases and deaths continuing to rise. This situation had a negative impact on the political, economic, social, cultural, defense, and security aspects, as well as the welfare of the people in Indonesia (3). The prevention and control of COVID-19 (PCCOVID-19) still

relies on the national policies and has not sufficiently empowered the community; has a top-down nuance (from top to bottom) and uses a minimum bottom-up approach; has not effectively empowered personal, interpersonal, and communal PCCOVID-19 behavior, with cadres as the driving force. The cadres are being trained by the health care workers in a short period of time. Considering that most of the health care workers, including cadres or COVID task force, are working in a vulnerable area, hence the PCCOVID-19 behavior needs to be maintained carefully (4).

Boyolali is one of the cities in Central Java province, which has the third highest number of COVID-19 cases during the 2-year pandemic period (3). The Boyolali District Health Office is responsible for carrying out regional government affairs in the health sector. This health office has several missions, namely, optimizing complete health services; improving the quality of health resources; improving the early warning system for disease prevention, strengthening the effective, efficient, and accountable health management; increasing preventive/promotional efforts to create a clean, healthy, and independent living culture in the community; and mobilizing partnerships and community participation (5).

In order to tackle the second wave of COVID-19 or prevent the third outbreak, certain health promotion activities that involve and empower the community are urgently needed. The health belief model (HBM) is the first theory in the field of health that is related to health behavior and can be used to explain preventive behaviors and responses to disease at the individual level (6). Social cognitive theory (SCT) can be used for analyzing health behaviors at the interpersonal level, while the social support model (SSM) is suitable for analyzing health behavior at the community level. Hence, this study aimed to build a health promotion model of PCCOVID-19 behavior, based on a comprehensive analysis at the individual, interpersonal, and community levels of PCCOVID-19 behavior.

MATERIAL and METHOD

This study used both surveys as quantitative research methods and focus group discussions (FGDs) as qualitative research methods. Data were collected between July and September of 2021. The Central Java province has the third highest number of confirmed COVID-19 cases; hence, this research targeted one of the cities in Central Java province, Boyolali, as the research location.

The questionnaire used to conduct the survey and FGDs were developed based on the HBM theory, SCT, and SSM. The questionnaire based on the HBM theory consists of five constructs: perceived susceptibility (six items), perceived severity (seven items), perceived benefits of action (six items), perceived barriers to action (12 items), and cues to action (11 items). The four key dimensions of the SCT as follows: self-efficacy (five items), observational learning (five items), outcome expectations (four items), and behavioral capability (three items). The three constructs related to the SSM were as follows: instrumental support (three items), informational support (three items), and emotional support (four items). Moreover, seven items related to the behavior aspect of PCCOVID-19 were also included in the survey.

Participants

Only adult participants were included in the survey: members of the COVID-19 task force, healthcare workers, and common citizens who were not included in the two previous groups. On the contrary, FGDs only included the members of the COVID-19 task forces only (who were on duty for at least six months).

Data collections and analysis

Data were collected between July and August 2021 using Google forms for the survey. The purposive sampling was used through the distribution of online questionnaire links using the WhatsApp application to participants who lived in Boyolali. The minimum sample

size was 30 (7). As for the FGD, a zoom meeting was held on September 4, 2021, among the researchers and the COVID-19 task force members from three districts in Boyolali. To obtain the quantitative data, univariate analysis, chi-square test, and path analysis as the chosen multivariate analysis, were performed. Then, a qualitative analysis was performed based on the FGD results. The FGD results were transcribed, and coding, clustering, thematic labelling, and interpretation were performed.

The study was approved by the Sebelas Maret University, Faculty of Medicine Research Ethics Committee (Date: 21.05.2021 and Number: 41/UN27.06.6.1/KEP/EC/2021). Prior to the study, an online informed consent form was also provided at the beginning of the questionnaire for each participant.

RESULTS

Quantitative analysis

92% (N= 153) questionnaires were eligible for quantitative analysis. Based on the results of the univariate analysis (Table 1), 53.6% of the respondents were women, 47% were COVID-19 task force members, 52.9% were civilians, 60.1% were aged > 40 years, and 86.9% were married.

Table 2 describes the correlation between each independent variable and the PCCOVID-19 behavior. Perceived susceptibility (p 0.004), perceived severity (p 0.005), cues to action (p 0.003), observational learning (p 0.006), outcome expectations (p 0.022), informational support (p 0.000), and emotional support (p 0.000) had significant correlations ($p<0.05$) with the PCCOVID-19 behavior.

Based on the path analysis results (Table 3), perceived susceptibility, observational learning, outcome expectations, instrumental support, and emotional support had a direct significant correlation with PCCOVID-19 behavior. Meanwhile, perceived susceptibility and perceived barriers had an indirect significant correlation with PCCOVID-19 behavior through cues to action variables. The whole path analysis model (Figure 1) showed that 53% of the variables correlated with PCCOVID-19 behavior based on the HBM, SCT, and SSM constructs. However, 47% could be correlated with other variables outside the model.

Table 1. Participant characteristics (n=153)

Characteristics		n	%
Sex	Male	71	46.4
	Female	82	53.9
COVID-19 task force	Yes	72	47
	No	81	52.9
Age range (years)	< 20	2	1.3
	20-40	59	38.7
	> 40	92	60.1
Marital status	Yes	133	86.9
	No	20	13

n: total number of respondents; n: number of respondents in a certain characteristic group

Table 2. Result of the chi-square analysis of the relationship between independent variables and the PCCOVID-19 behavior

Independent variables	p value (95% CI;=0.05)
Perceived susceptibility	0.004**
Perceived severity	0.005**
Perceived benefits of action	0.745
Perceived barriers to action	0.084
Self-efficacy	0.026*
Cues to action	0.003**
Observational learning	0.006**
Outcome expectations	0.022*
Behavioral capability	0.577
Instrumental support	0.187
Informational support	0.000***
Emotional support	0.000***

*significant ($p < 0.05$), ** significant ($p < 0.01$), *** significant ($p < 0.001$)

Table 3. Result of path analysis on the correlation between independent variables and PCCOVID-19 behavior based on HBM, SCT, and SSM constructs

Dependent variable	Independent variable	b	95% CI		p
			Lower	Upper	
Direct influence					
PCCOVID-19 behavior	Perceived susceptibility	0.05	0.01	0.09	0.006**
PCCOVID-19 behavior	Perceived severity	−0.01	−0.07	0.04	0.578
PCCOVID-19 behavior	Perceived benefits	0.01	−0.03	0.06	0.496
PCCOVID-19 behavior	Perceived barriers	0.01	−0.02	0.02	1.000
PCCOVID-19 behavior	Cues to action	−0.01	−0.03	0.02	0.699
PCCOVID-19 behavior	Self-efficacy	−0.02	−0.09	0.04	0.535
PCCOVID-19 behavior	Observational learning	−0.07	−0.14	−0.01	0.042*
PCCOVID-19 behavior	Outcome expectations	0.06	0.01	0.12	0.019*
PCCOVID-19 behavior	Informational support	−0.07	−0.16	0.01	0.097
PCCOVID-19 behavior	Instrumental support	−0.09	−0.16	−0.01	0.017*
PCCOVID-19 behavior	Behavior capability	0.01	−0.09	0.10	0.926
PCCOVID-19 behavior	Emotional support	0.07	−0.01	0.14	0.055*
Indirect influence					
Cues to action	Perceived susceptibility	0.45	0.19	0.72	0.001***
Cues to action	Perceived severity	0.32	−0.06	0.71	0.100
Cues to action	Perceived benefits	−0.19	−0.53	0.14	0.256
Cues to action	Perceived barriers	−0.18	−0.32	−0.04	0.008**

n = 153; R^2 = 53.07

*significant ($p < 0.05$), ** significant ($p < 0.01$), *** significant ($p < 0.001$)

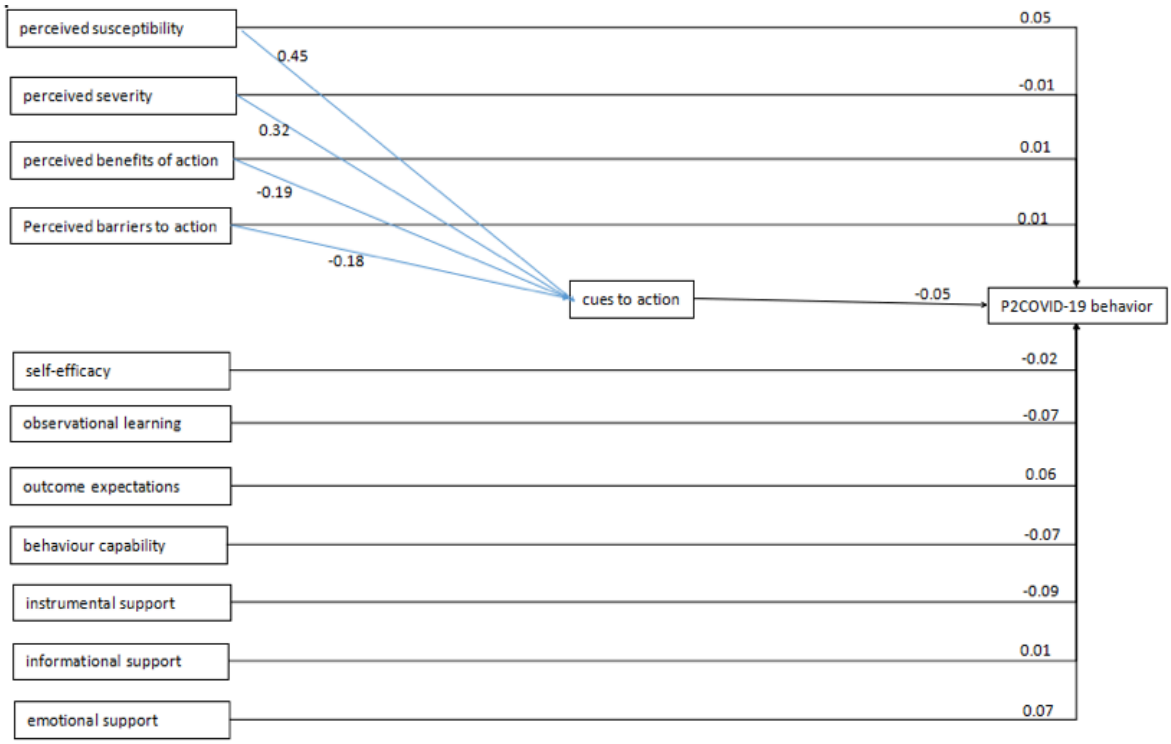

Figure 1. Path analysis model of PCCOVID-19 behavior

*The numbers above express the "b" or the Path coefficient

Qualitative analysis

The FGD responses regarding the independent variables based on the HBM theory, SCT, and SSM were as follows:

Perceived susceptibility refers to the beliefs about risk or susceptibility to disease, in this case, COVID-19. All the participants believed that they were at risk of contacting COVID-19; if they are working as a healthcare provider and that they are expected to take care of COVID-19 patients on a daily basis. Even after they have been vaccinated, they believe that they are still at risk of becoming infected. Approximately 37% of the informants in this FGD were previously infected with severe acute respiratory syndrome coronavirus 2 during the pandemic.

Perceived severity refers to the beliefs about the likely severity of an illness or condition, including an evaluation of its medical and clinical consequences (e.g., death) and social consequences (e.g., effects on family life and social relationships). Approximately 75% of the informants agreed that COVID-19 is a serious disease and has life-threatening consequences on one's health if they have existing comorbidities. Moreover, 37% of the informants also indicated that COVID-19 can be prevented; hence, people should strengthen their immune system to avoid contracting the disease. The symptoms of COVID-19 could not be distinguished from common colds or influenza; some informants added, "the symptoms including lost of the capability to smell and taste" (informants 1, 2,

and 3).

"The severity of the disease depends on the individual condition, if your immunity is high, you will only get mild COVID-19, but if you have comorbidities then you will get severe COVID-19" (informant 4, 5, and 8).

The perceived benefits of action can be explained as individual perceptions of the value or benefit of health behaviors in reducing the disease risk (COVID-19). All informants agreed to follow the health protocols suggested by the government to reduce the risk of infection and prevent the spread of COVID-19 in the community. The 5M protocol consists of wearing a mask, maintaining social distancing, performing hand hygiene, avoiding the crowd, and reducing mobility.

"At first wearing a mask was seen as a funny action, but now not wearing a mask will look funny; In the past if you wear a mask outside house, you would be considered as doing a funny action, but if you leave the house now and don't wear a mask, you will look different. You will feel awkward if you are going out without wearing a mask" (informants 1, 2, and 3).

Perceived barriers to action can be described as an individual's perception of barriers to changing their behavior, which refer to any obstacles or barriers to behavioral change. There are some difficulties in applying the health protocol (5M) to society; some are still confused on the proper protocol of wearing face masks, including its cost.

"Regarding the issue of costs, masks must be replaced or discarded frequently, it costs you money" (informants 1, 2, 3, 4, 5, and 8).

The other barriers are maintaining social distancing and avoiding the crowd, considering the cultural aspects in rural areas where social gatherings still take place even during the pandemic.

The hoax about COVID-19 that spread through various online media also influences someone's level of obedience to the health protocols.

Cues to action refers to the impetus needed to trigger the decision-making process for health behavior to occur. The healthcare workers and the members of COVID-19 task force worked together to encourage society to follow the 5M protocol during the pandemic. Further health education and promotion about COVID-19 leads to the adoption of more health behaviors in the society to prevent the spread of COVID-19. Provision of sanctions to those who disobeyed the 5M protocol could also increase the obedience of the people during this pandemic.

"PCCOVID-19 socialization, continue to carry out the protocol, all residents are expected to continue to wash their hands, keep their distance and obey the existing rules Jogo Tonggo (taking care of your neighbor); conducting tracking; providing basic necessities from the village, from the factory; motivation for those who do self-isolation to keep running the protocol and obey the existing rules" (informants 1, 2, and 3).

Self-efficacy refers to the beliefs about the personal ability to perform health behaviors. The informant felt confident that their behavioral change help prevent the spread of COVID-19, and they were fully aware that the following protocol is important. Wearing masks and washing hands have become a new routine.

"5M is quite effective in preventing COVID-19, if we wear a mask, the droplets (splashes of phlegm) that we release do not hit other people; Washing hands with soap and running water can get rid of the virus" (informants 1, 2, and 3).

Observational learning can be described as learning to perform new behaviors with interpersonal exposure or media, particularly through peer modeling. The 5M protocol was followed well by the society in the early period of the pandemic; however, later on, some of the society members were no longer following the 5M protocol. During the second wave of COVID-19, the Indonesian government started to enforce a new policy called "Emergency Enforcement of Restrictions on Community Activities" (called PPKM darurat in Bahasa Indonesia). The community felt the effect of the PPKM darurat policy soon after the first

day of implementation. When the government started to ease the implementation of the PPKM darurat, the 5M protocol were no longer strictly followed by the community, which was deeply regretted. The COVID-19 task force has to work harder and provide a good example in maintaining the strict implementation of the 5M protocol during this pandemic, which also influences the obedience of the community in engaging with the 5M protocol.

Outcome expectations refers to the beliefs about the likelihood and value of the consequences of behavioral choices. The COVID-19 task force became the leader in implementing the 5M protocol during the pandemic. By providing good health promotion, education, and a good example for the society, it can lead to a decrease in the number of COVID-19 cases and break the chain of its transmission. The community is still following the 5M protocol until a new policy is announced. One of the 5M protocols, which is handwashing, has already been practiced long before the pandemic occurred; the COVID-19 outbreak reminds us to maintain proper hand hygiene regularly.

Behavioral capability is defined as the ability to maintain self-control through self-monitoring, goal setting, provision of feedback, maintaining self-esteem, use of self-instruction techniques, and social support. The COVID-19 task force members were vaccinated early compared with the general population; some have already received the complete dose, while the others just received their first dose of vaccine. As regards the use of face masks, some still practice improper use of face masks, often pull the mask down to their chin, or cover only the mouth. Moreover, huge companies have to take care of their employees by providing proper places for washing hands and distributing face masks. To avoid crowds during break times, all employees have been suggested to bring their own packed meals from home.

Instrumental support refers to the provision of tangible aid and services, which directly helps people in need. The Indonesian government distributed aids to the community during the pandemic, including face masks, built handwashing facilities in strategic places, provided financial aid to the eligible individuals, and so on. Villages also received financial support and were provided with disinfectant agents. The members of the community also helped someone who are on home quarantine by delivering food and drinks or their daily needs. Members of the task force who are performing COVID-19 testing, contact tracing, and monitoring of individuals with confirmed or suspected cases also help distribute the groceries provided by the government.

"COVID-19 task force also provide assistance with basic daily needs" (informants 4 and 5).

Informational support can be described as providing advice, suggestions, and information that a person can use to solve problems. The COVID-19 task force helps solve various issues regarding the pandemic, promote 5M, provide updates and reminders to the public, and monitor the obedience level of the society members in terms of following the health protocols, despite certain disagreements regarding the implementation of the protocol.

"The COVID-19 task force always tries to provide information and motivation in the village, with health cadres as the driving force, although sometimes they forget, but that's normal as a human being" (informants 6 and 7).

Emotional support refers to the provision giving empathy, love, trust, and care. The COVID-19 task force provides the best example during the pandemic following the 5M protocol. Good communication between the community members and the COVID-19 task force regarding various issues during this pandemic is important. In order to do that, members of the COVID-19 task force also performed home visits (following appropriate protective measures and protocols) in families with confirmed COVID-19.

"Visiting people who do self-isolation in their home. If there is a death in the community because of COVID-19, we have a team of volunteers (to help the funeral with a certain protocol)" (informants 1, 2, and 3).

DISCUSSION

The COVID-19 pandemic remains the main global health issue in 2021. During the second year of the pandemic, some countries had already survived the peak of infection, but other countries are still experiencing the second wave of the COVID-19 pandemic (8). This research aimed to build a health promotion model of PCCOVID-19 behavior by conducting a comprehensive analysis of this behavior at the individual, interpersonal, and community levels, based on the HBM, SCT, and SSM constructs. A total of 153 respondents completed the questionnaire; the respondents' age ranged between 16 and 70 years, with a mean age of 43.22 ± 11.87 years. Perceived susceptibility, observational learning, outcome expectations, instrumental support, and emotional support were directly and significantly correlated with PCCOVID-19 behavior. Meanwhile, perceived susceptibility and perceived barriers had an indirect significant correlation with PCCOVID-19 behavior through cues to action variables.

Based on the results of the path analysis, 53% of the participants displayed various PCCOVID-19 behaviors. The results of this study differed from those of a study conducted in Iran, where perceived benefits, perceived barriers, and self-efficacy significantly predicted the protective behaviors of COVID-19. However, the perceived susceptibility and perceived severity in the model were not significant (9). In another previous study, perceived severity, perceived barriers, perceived benefits, and cues to action were statistically related to health protocol compliance. Meanwhile, perceived susceptibility and self-efficacy were not statistically related to health protocol compliance (10). Our study was conducted during the second wave of COVID-19 pandemic in Indonesia; hence, this difference might have been due to the variations in time periods when the research was conducted.

Based on the path analysis model in this research, perceived susceptibility had a significant direct correlation with PCCOVID-19 behavior. This finding is similar to that of a previous study conducted in East Java Province, Indonesia. In those studies, perceived susceptibility had a strong correlation with health practices, including social distancing, handwashing, and wearing of face masks (11).

Behavior is also influenced by cues to action. A cue to action is an event, person, or thing that moves to change the behavior and could be internally or externally motivated (9, 12). Watching television or listening to the radio to obtain updates regarding the status of the COVID-19 pandemic is an action related to the prevention and control of the COVID-19.

HBM explains that cues or triggers to act are needed to encourage participation in the health behavior that is being promoted (12). In this study, cues to action were considered as an intermediate variable. Perceived susceptibility and perceived barriers of action had an indirect significant correlation with PCCOVID-19 behavior through cues to action variable. The Indonesian government continues to educate and promote health behaviors related to COVID-19 through various media, online or offline. This task was performed by the COVID-19 task force with the assistance of their cadres who were assigned in the different villages in Indonesia (3). All government programs related to the COVID-19 pandemic are considered as external cues to action, which will play a major role in encouraging people to have their internal cues to action in order to change their behavior (9). Indeed, with the right education and promotion of preventive measures for COVID-19, the perceived susceptibility of each individual will increase, and it can encourage them to follow the 5M protocol properly (11).

Perceived barriers of action refer to the obstacles in carrying out preventive behaviors; the community members will find it difficult to carry out these actions. Individuals with low barriers will tend to take preventive action (9). In order to lower the barrier and to achieve behavioral change, the government with its COVID-19 task force groups along with the health cadres actively educate and

facilitate the community through various health programs that target communities in all ages (13). The greater the support given to the community, the lower is the barrier to behavioral change (9).

"SCT emphasizes that human behavior is the product of the dynamic interplay of personal, behavioral, and environmental influences" (14). The COVID-19 task force and its health cadres have to strictly follow the 5M protocol; first, they have to change their behavior while they are in their community. When the community observes that others can change their behavior in order to protect themselves, it will encourage observational learning, as one of the SCT constructs, through peer modelling. Observational learning involves information processing and responses; because the pandemic already occurred for more than 1 year and the second wave occurred during the period of this study, the correlation between observational learning and PCCOVID-19 behavior was significant. A different finding was reported in another study conducted in China, where observational learning did not significantly correlate with the protective behavior of COVID-19 (i.e., vaccination) (14). The other construct of SCT is outcome expectation. In this study, outcome expectation had a direct significant correlation with PCCOVID-19 behavior; this result was also similar to that of a previous study in China, where outcome expectation was significantly and consistently associated with protective behavior of COVID-19 (i.e., vaccination) (14). The 5M protocol aimed to prevent COVID-19 spread in the community; by following the 5M protocol, we expect to break the transmission chain and prevent more morbidity and mortality during the pandemic.

Social support is described as the perception and actuality of being noticed, ensuring that help is available from others, and becoming part of a supportive social network. Community is expected to be helpful, especially in difficult times, such as pandemics, and avoid any intentional negative interactions (15). Among the constructs of SSM are instrumental support and emotional support, which have a direct significant correlation with PCCOVID-19 behavior. The COVID-19 task force is one of the biggest supports that the community has during this pandemic, and it can function as a social support. This gives the provision of tangible aid and services, directly helping people in need, based on government recommendations. As an emotional support, the COVID-19 task force performs home visits to people who are under home quarantine (using proper protection). All of these supportive behaviors are required to help the community improve their PCCOVID-19 behavior as part of their battle against the pandemic.

A limitation of this research is the lack of participants, which was understandable as it was conducted during the second wave of COVID-19. This study conducted an online, Google form-based online survey and online FGD in response to the social or physical distancing rule implemented during the second wave; hence, the survey could not reach certain groups in the population. Despite these limitations, to the best of our knowledge, this was the first study conducted in Indonesia to analyze the PCCOVID-19 behavior at the individual, interpersonal, and community levels using the HBM, SCT, and SSM constructs.

The PCCOVID-19 behavior change can be optimized by applying the HBM, SCT, and SSM constructs. As it is difficult to change the behavior in a community, the health promotion model should include strategies at the individual, interpersonal, and community levels. Perceived susceptibility, observational learning, outcome expectations, instrumental support, and emotional support were directly and significantly correlated with PCCOVID-19 behavior. Meanwhile, perceived susceptibility and perceived barriers had an indirect significant correlation with PCCOVID-19 behavior through cues to action variables. These findings can be used by the healthcare workers and COVID-19 task force members to establish health promotion models and interventions in order to enhance the PCCOVID-19 behavior.

ACKNOWLEDGEMENTS

We express our gratitude to the government and the contributions of Health Office of Boyolali City. This study is supported by The Institute for Research and Community Service, Sebelas Maret University, Surakarta, Indonesia, through Research Group Grant 2021. We are also thankful for the excellent professional language editing service by Editage (https://www.editage.com/).

ETHICS COMMITTEE APPROVAL

* The study was approved by the Sebelas Maret University, Faculty of Medicine Research Ethics Committee (Date: 21.05.2021 and Number: 41/UN27.06.6.1/KEP/EC/2021).

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

1. Iftimie S, Lo´pez-Azcona AF, Vallverdu´ I, Herna´ndez-Flix S, de Febrer G, et al. First and second waves of coronavirus disease-19: A comparative study in hospitalized patients in Reus, Spain. PLoS ONE, 2021; 16 (3): e0248029.

2. Jiali Lei, Mengyuan Li, Xiaosheng Wang. Predicting the development trend of the second wave of COVID-19 in five European countries. J Med Virol, 2021; 93:5896–5907.

3. Sub Direktorat Penyakit Infeksi Emerging. COVID 19 Indonesia (2021) (in Bahasa Indonesia) [online]. Website https://infeksiemerging.kemkes.go.id/ (accessed 28 October 2021).

4. Seyhan AU, Karaca B. Kuzeybatı Suriye Bölgesi'nde COVID-19 saptanan sağlık çalışanlarının demografik ve klinik özelliklerinin değerlendirilmesi. Turk Hij Den Biyol Derg, 2021; 78(1): 39 – 46.

5. Dinas Kesehatan Boyolali. Profil Kesehatan Kabupaten Boyolali Tahun 2019 (in Bahasa Indonesia). Boyolali: Dinas Kesehatan Boyolai, 2019; Pp: 4-20.

6. Dini Diah Nurhadianti. COVID-19 dan perubahan perilaku menuju adaptasi kebiasaan baru: ditinjau dari perspektif Health Belief Model Theory (2020) (in Bahasa Indonesia) [online]. Website http://repository.upi-yai.ac.id/270/ (accessed 13 October 2021).

7. Bhisma Murti. Desain dan ukuran sampel untuk penelitian kuantitatif dan kualitatif di bidang kesehatan (in Bahasa Indonesia). Yogyakarta: Gajah Mada University Press, 2018; 119.

8. Abdullah EG, Aral S, Kemal K, Esra S, Perihan A, et al. First known COVID-19 case and contact tracing efforts in İstanbul, Turkey. Turk J Med Sci, 2021; 51: 1653-1658.

9. Mirzaei A , Kazembeigi F, Kakaei H, Jalilian M, Mazloomi S, et al. Application of health belief model to predict COVID-19-preventive behaviors among a sample of Iranian adult population. J Educ Health Promot, 2021; 10: 69.

10. Maisyaroh A, Arifin, Nurhayatun E. Analisis tingkat kepatuhan masyarakat terhadap protokol kesehatan COVID-19 dengan pendekatan Health Belief Model di Kecamatan Banjarsari (in Bahasa Indonesia). Smart Med J, 2021; 1 (1).

11. Regi J, Meghana N, Anil B, Nazeema B, Manju L, et al. Public perception and preparedness for the pandemic COVID 19: A Health Belief Model approach. Clin Epidemiology Glob Health, 2021; 9: 41-46.

12. Winarti E, Wahyuni CU, Rias YA, Mirasa YA, Sidabutar S, et al. Citizens' health practices during the COVID -19 pandemic in Indonesia: Applying the health belief model (in Bahasa Indonesia). Belitung Nurs J, 2021; 7 (4): 277-84.

13. Satuan Tugas Penganganan COVID-19. Materi Edukasi (2021) (in Bahasa Indonesia) [online]. Website https://covid19.go.id/edukasi/pengantar (accessed 2 November 2021).

14. She R, Chen X, Li L, Li L, Huang Z, et al. Factors associated with behavioral intention of free and self-paid COVID-19 vaccination based on the social cognitive theory among nurses and doctors in China. Infect Control Hosp Epidemiol, 2021; 3:1-25.

15. Catherine AH, Barbara AI. Social networks and social support. In: Karen G, Barbara KR, K Viswanath, eds. Health Behavior and Health Education - Theory, Research, And Practice. 4th Ed [online]. Website https://www.med.upenn.edu/hbhe4/contact.shtml (accessed 2 November 2021).